

## Preliminary assessment of the psychometric properties of the Fat Talk Questionnaire in a sample of young women

<sup>1</sup> Centro Universitário São Camilo – CUSC. São Paulo/SP, Brasil.

<sup>2</sup> Universidade de São Paulo – USP. São Paulo/SP, Brasil.

E-mail: aline.depiano@gmail.com

### Abstract

Fat Talk (FT) is a term used to describe a behavior characterized by speech, thinking, and derogatory feelings towards one's own body and the body of another person. It is predominant in females and is related to worse body image and worse self-esteem. The Fat Talk Questionnaire (FTQ) is an instrument previously adapted cross-culturally for young women in Brazil. The aim of this study was to carry out a preliminary assessment of its psychometric properties. The FTQ was applied to 99 young females (18 to 19 years and 11 months), along with sociodemographic questions, the Rosenberg Self-Esteem Scale (RSS) and the Body Shape Questionnaire (BSQ8) to assess convergent validity (through the test Pearson's correlation). Confirmatory factor analysis was performed using the structural equation model with the allocation sampling technique. Internal consistency was assessed using Cronbach's Alpha and MacDonald's Omega. The structural equation model supported a one-dimensional scale ( $\chi^2/df = 1.62$ ; CFI = 0.953; TLI = 0.935 and RMSEA = 0.079 [95%CI: 0.051-0.176]). The instrument presented an  $\alpha$ -Cronbach of 0.89 [95%CI: 0.85-0.92] and an  $\omega$ -MacDonald of 0.89; there was a high correlation with the BSQ8 (0.70) and a mean correlation (0.42) with the RSS. The instrument presented an adequate internal consistency, the confirmatory factor analysis of the FTQ supported a unidimensional instrument with satisfactory factor loadings, and a correlation was found between more Fat Talk behavior with greater concern with body shape and worse self-esteem.

**Keywords:** Surveys and Questionnaires. Psychometry. Body dissatisfaction. Self-image.

### INTRODUCTION

The term Fat Talk (FT) refers to negative conversations about body shape<sup>1</sup> as well as the derogatory way of talking, thinking, and listening about one's own body or the body of another person<sup>2</sup>.

Studies on FT began in 1994 with research on the subject<sup>1</sup> and were later developed by Nichter in 20002. The publications on FT that followed which evaluated this behavior in young women found a relationship between FT and the incorporation of a thin body<sup>3</sup>, greater dissatisfaction body, worsening in eating behavior<sup>1,4,5,6,7,8</sup>, presence of eating disorders and unhealthy behaviors in relation to food<sup>9,10,11</sup> which are also potential factors

of stress and in the search for thinness<sup>12</sup>.

These studies evaluated the impact of Fat Talk and its implications, using instruments such as the Fat Talk Questionnaire<sup>13</sup>, Fat Talk Scale<sup>14</sup>, Male Body Talk Scale<sup>15</sup>, the Family Fat Talk Questionnaire<sup>16</sup>, Negative Body Talk (NBT)<sup>17</sup> and, more recently, the Body Talk Scale<sup>18</sup>. However, most of them<sup>4,19,20,21,22,23</sup> used the Fat Talk Questionnaire (FTQ) which has an ample range of content, and can be applied and adapted to different contexts, cultures, and ethnicities. Furthermore, the Male Body Talk Scale<sup>15</sup> and the Family Fat Talk Questionnaire were built from the adaptation of the FTQ<sup>16</sup>. Comparing the existing instruments for as-

DOI: 10.15343/0104-7809.202246527538I

sessing the FT, it can be concluded that the FTQ has a broader content of items, which describe behaviors that may occur in different situations and refer to various parts of the body. The original study was conducted with 200 young women aged 17 to 25 years old. In this original study, the PCA test (Principal Component Analysis) was used to summarize the 64 initial items proposed for the instrument, as well as to assess its psychometric properties. In this process, the existence of two components was observed, which explain the 55.03% variance detected by the Kaiser criterion: 13 of the 16 questions corresponded to "component 1" (48.41% of the variance), and 3 questions indicated a second factor corresponding to "component 2" (6.62% of the variance). After adjustments and subsequent analyses of the two components found, the authors concluded that there was little use in keeping component 2, excluding it from the questionnaire; and ending the instrument with 14 questions – including one question that had a factor weighing in both. A new PCA was performed, which indicated that this 14-item version of the FTQ was presented as a unidimensional scale, capable of evaluating the behavior of Fat Talk<sup>13</sup>.

The FTQ was evaluated to validate convergent, discriminant, and known groups. Convergent validity was performed with the Fat Talk Scale (FTS)<sup>24</sup> and correlation analysis with body image (using the Body Shape Questionnaire), food restriction (using the Revised Restraint Scale: RS), anxiety (using the Social Physique Anxiety Scale: SPAS), as well as perception of the body objectification experience through the Objectified Body Consciousness Scale (OBS)<sup>25</sup>. Discriminant validity was determined by evaluating the FTQ and the Marlowe-Crowne Social Desirability Scale (SDS). The application of the questionnaire in known groups (know-groups) was carried out in a sample of men. In this case, the choice for males resulted from the fact that the FTQ was prepared from interviews with young women, as

it is believed that this behavior is more characteristic of the female audience. Thus, the result of the behavior assessment tends to be more expressive among women<sup>13</sup>. The FTQ showed a strong correlation with the BSQ and the FTS, moderate with the RS, SPAS and OBS. Regarding the SDS, for discriminant validity, the FTQ showed no correlation<sup>13</sup>.

The FTQ was developed and psychometrically evaluated with a sample of young men and women of diverse ethnicity. Therefore, although cultural specificities must be considered for adaptation to other countries and languages, the FTQ is considered reasonably generalizable, considering the situational and cultural diversity of the respondents<sup>26</sup>. There was no instrument for assessing the FT in Brazil; however, recently the FTQ was cross-culturally adapted to Brazilian Portuguese by Silva, Ganen, Alvarenga<sup>26</sup> – but without the assessment of psychometric properties (including factor analysis and internal consistency, as well as convergent validity with other interconnected constructs – such as dissatisfaction with Body Image and Self-esteem). As previously mentioned, the original FTQ had its psychometric properties evaluated to define the 14-item questionnaire, in three stages, the first being the development of the Fat Talk Questionnaire items and the exploratory analysis of the main components (Principal Components Analysis). The second step was to assess the preliminary psychometric properties through reliability (internal consistency) and validity (convergent, discriminant and known groups). Finally, the last step aimed to examine the test-retest reliability in a sample of young university students, resulting in an instrument considered one-dimensional<sup>13</sup>.

The aim of the present study was to perform a preliminary psychometric assessment of the FTQ, including confirmatory factor analysis, internal consistency, and convergent validity. It is believed that having an adapted instrument with validated data for the evaluation of this construct

will help expand the understanding of the phenomenon and associated factors in our environment, as well as assist in the development and

evaluation of strategies to prevent this behavior together with the prevention of body dissatisfaction.

## METHODS

### *Study design population and sample*

The psychometric evaluation of the FTQ, the instrument was applied to a group of young women, undergraduate students in Nutrition, from a private Higher Education Institution. After the Institution's consent, the students were invited through the Teams® platform, during the 2021 school year, during the hybrid class period. A link to access the survey was made available via Google Forms, along with an invitation letter together with the Informed Consent Form.

The sample was non-probabilistic, using the inclusion criteria: being a student enrolled in a private Higher Education Institution, female, between 18 and 19 years and 11 months.

The recommendation of Hair Jr. *et al.*<sup>27</sup> was followed for the psychometric assessment of instruments, which recommends that the sample should contain 5 to 10 participants per instrument issue. Considering that the FTQ has 14 items, a sample of between 70 and 140 students was sought.

### *Instruments*

The FTQ cross-culturally adapted to Brazilian Portuguese was used<sup>26</sup>. The questionnaire has 14 items that must be answered on a Likert-type scale from 1 to 5 points (1 = never and 5 = always), ranging from 14 to 126 points; whose higher scores indicate greater engagement in Fat Talk behavior.

Concern about body shape was assessed using the Body Shape Questionnaire (BSQ-8) – the reduced version<sup>28</sup> whose response options are in a Likert-type format of points, ranging from 1 – never to 6 – always. The higher the score, the greater the dissatisfaction is.

The assessment of self-esteem was performed using the Rosenberg Self-Esteem Scale adapted for adolescents<sup>29</sup>. The scale is Likert type, consisting of 10 points, with the answers “strongly agree”, “agree”, “disagree” and “strongly disagree”, scored as follows for questions 1, 3, 4, 7, 10: a) 0, b) 1, c) 2, d) 3. Meanwhile, questions 2, 5, 6, 8, 9 present the alternatives with decreasing scores, namely: a) 3, b) 2, c) 1, d) 0. The higher the total score, the greater the self-esteem<sup>29-30</sup>.

Sociodemographic data were collected through specific questions: age, family income (in minimum wages), parental education, and self-reported weight and height used to assess nutritional status according to BMI/age according to WHO<sup>26</sup>).

### *Procedures*

The study was carried out with students of the undergraduate course in Nutrition, from a Higher Education Institution. The invitation to participate in the survey was made during the period of synchronous remote classes, in 18 classrooms, through the Microsoft Teams platform and access to the link to answer the questionnaires on Google Forms. The informed consent form was completed online and prior to accessing the questionnaires, and the anthropometric and sociodemographic data were self-reported. After 3 weeks, 127 university students returned, but 28 were excluded from the sample because they were older than 19 years and 11 months, totaling 99 participants.

### *Data analysis*

Initially, using the JAMOVI statistical program version 1.6.7, mean and standard deviation values were calculated, together with asymmetry and

kurtosis measures, to describe and verify the univariate normality behavior of the items of the two instruments. To investigate the multivariate normality of the data, the Mardia test was used<sup>31-32</sup>.

To verify the psychometric properties of the FTQ, the data collected from the 99 respondents were analyzed using structural equation modeling, using the Latent Variable Analysis (Lavaan) and psych packages.

Confirmatory Factor Analysis was performed to confirm the factor structure of the FTQ, using a non-parametric approach with syntax written in R to investigate whether the measurement model fits the item correlation matrix. Since the data violated the normality assumption, a Bollen-Stine Bootstrap procedure was performed to obtain a corrected Chi-square value of the estimated coefficients for the Maximum Likelihood estimator<sup>33</sup>.

Using the bootstrap technique, the average of the fit indices of the model with 1000 samples was computed. Bootstrapping relies on the simulated sampling distribution to provide its own context for calculating estimates of unknown population values, where repetitive samples with replacement are taken from the original group<sup>34</sup>.

This matrix was submitted to the Weighted Least Squares Estimation Method (WLSMV), adjusted by the mean of the variance, since this method allows for more accurate and less biased estimations for ordinal-level categorical indicators that do not meet normality assumptions.

As a criterion for the fit of the model, the following fit indices were used: chi-square ( $\chi^2$ ); chi-square ratio and degrees of freedom ( $\chi^2/df$ ); Root Mean Square Error of Approximation (RMSEA); Comparative Fit Index (CFI); and Tucker-

r-Lewis Index (TLI). Values of  $\chi^2/df$  should be  $\leq 5$ , while CFI and TLI values should be  $\geq 0.90$  and preferably above 0.95. RMSEA values should be  $\leq 0.08$  or, preferably,  $\leq 0.06$ , with the upper limit of the confidence interval  $\leq 0.10$ <sup>34-37</sup>.

Convergent validity was analyzed by means of average variance extracted (AVE) and composite reliability (CR), with an expected AVE  $\geq 0.5$  and CR  $\geq 0.7$ <sup>37</sup>. Convergent validity with the FTQ with BSQ-8 and RSS was performed by Pearson's correlation test (since the questionnaire scores were normally distributed). There is an extensive theoretical framework on the relationship between Fat Talk behavior and body image issues<sup>8,38</sup> that support this analysis. As for self-esteem, although there is no study that evaluated the FTQ, the relationship between Fat Talk behavior and self-esteem (using other instruments) has already been demonstrated<sup>8,39</sup>. Likewise, the correlation between the FTQ and the Body Mass Index (BMI) was evaluated, considering values from 0.1 to 0.30 weak, 0.40 to 0.6 moderate, and 0.7 to 1.0, strong<sup>40-41</sup>.

The internal consistency of the FTQ was evaluated using Cronbach's Alpha coefficient, and values between 0.70 and 0.95 identify adequate internal consistency<sup>4</sup>, and for McDonald's omega, values must be  $\geq 0.70$ <sup>42-44</sup>. All analyses were performed in the statistical program R (version 4.2.0 for Mac iOS).

The study was submitted and approved by the Research Ethics Committee under opinion No. 4.481.117, according to the rules of Resolution No. 466/2012 of the National Health Council of the Ministry of Health for research on human beings.

## RESULTS

The study included 99 young women aged between 18 and 19 years and 11 months (mean 19.16, SD 0.79). Regarding nutritional status, 70.7% were eutrophic, 16.2% were overweight, 10.1% were thin, and 3% were obese. As for fa-

mily income, 39.4% were in the range of 4 to 10 minimum wages (R\$ 4,180.01 to R\$ 10,450.00), 29.3% of the participants were between 2 and 4 minimum wages (R\$ 2,090.01 to R\$ 4,180.00), 21.2% in the salary range above 10 minimum

wages (R\$ > R\$ 10,450.01), and 10.1% in the range of up to 2 minimum wages (< R\$ 2,090.00). The level of education of the head of the family was 46.5% with complete higher education and 31.3% with complete secondary education (data not reported in the table).

The 99 young women answered all 14 questions of the FTQ, with the frequency of answers shown in Table 1, as well as the respective medians and interquartile range of each item of the questionnaire. The mean FTQ score for this population was 33.21 (SD 10.41).

The items with the highest frequency of response often and always were item 14 ("When I'm with one or more friends, I complain that I'm not

in shape") with 32.4% between always and often, and item 10 ("When I'm with one or more friends I complain that I need to stop eating a lot") with a sum of 26.2%.

Next, item 6 ("When I'm with one or more friends, I complain that I'm fat") with 25.3% always and often, and item 3 ("When I'm with my friends, I criticize my body comparing it to thin women) with 25.2% stand out.

Furthermore, also above 20% of the use of always and often are items 7 ("When I'm with one or more friends, I complain that I shouldn't eat fattening foods") and 8 ("When I'm with one or more friends, I complain that I've gained weight") with 23.3% and 24.3%, respectively.

**Table 1** – Frequency of responses by adolescents (N=99) to the Fat Talk Questionnaire items. São Paulo Brazil. 2022

| Items  | 1 (%) | 2 (%) | 3 (%) | 4 (%) | 5 (%) | Median (IQ) |
|--|-------|-------|-------|-------|-------|-------------|
| 1) When I'm with one or more friends, I complain that my arms are too flabby.                          | 50.5  | 19.2  | 18.2  | 11.1  | 1.0   | 1 (2)       |
| 2) When I'm with one or more friends, I complain that my belly is fat.                                 | 11.1  | 23.2  | 35.4  | 21.2  | 9.0   | 3 (2)       |
| 3) When I'm with one or more friends, I criticize my body comparing it to the thin women in the media. | 19.2  | 28.3  | 27.3  | 11.1  | 14.1  | 3 (1.5)     |
| 4) When I am with one or more friends, I complain that my body is not proportionate.                   | 18.2  | 28.3  | 28.3  | 19.2  | 6.1   | 3 (1.5)     |
| 5) When I'm with one or more friends, I complain that I hate my whole body.                            | 53.5  | 22.2  | 15.2  | 5.1   | 4.0   | 1 (1)       |
| 6) When I'm with one or more friends, I complain that I'm fat.   | 16.2  | 32.3  | 26.3  | 15.2  | 10.1  | 3 (1.5)     |
| 7) When I'm with one or more friends, I complain that I shouldn't eat "fattening foods".               | 30.3  | 26.3  | 20.2  | 16.2  | 7.1   | 2 (2)       |
| 8) When I'm with one or more friends, I complain that I've gained weight.                              | 17.2  | 27.3  | 31.3  | 15.2  | 9.1   | 3 (1)       |
| 9) When I'm with one or more friends, I complain that my clothes are too tight.                        | 45.5  | 26.3  | 15.2  | 7.1   | 6.1   | 2 (2)       |
| 10) When I'm with one or more friends, I complain that I need to stop eating a lot.                    | 31.3  | 27.3  | 15.2  | 13.1  | 13.1  | 2 (3)       |
| 11) When I'm with one or more friends, I criticize my body comparing to my friends' bodies             | 28.3  | 30.3  | 26.3  | 11.1  | 4.0   | 2 (2)       |
| 12) When I'm with one or more friends, I complain that I feel pressured to be thin.                    | 44.4  | 20.2  | 23.2  | 9.1   | 3.0   | 2 (2)       |
| 13) When I am with one or more female friends, I complain that my body is disgusting/repulsive.        | 82.8  | 10.1  | 4.0   | 1.0   | 2.0   | 1 (0)       |
| 14) When I'm with one or more friends, I complain that I'm not in shape.                               | 12.1  | 19.2  | 36.4  | 15.2  | 17.2  | 3 (2)       |

1 = never; 2 = rarely; 3 = sometimes; 4 = often; and 5 = always



For the confirmatory factor analysis (CFA), the correlation matrix between items was revised for highly correlated items (i.e. co-variants) and negative correlations. No negative correlations were found, meanwhile 8 items with high correlations were flagged, items in each identified pair were inspected for redundancy, and no item was excluded.

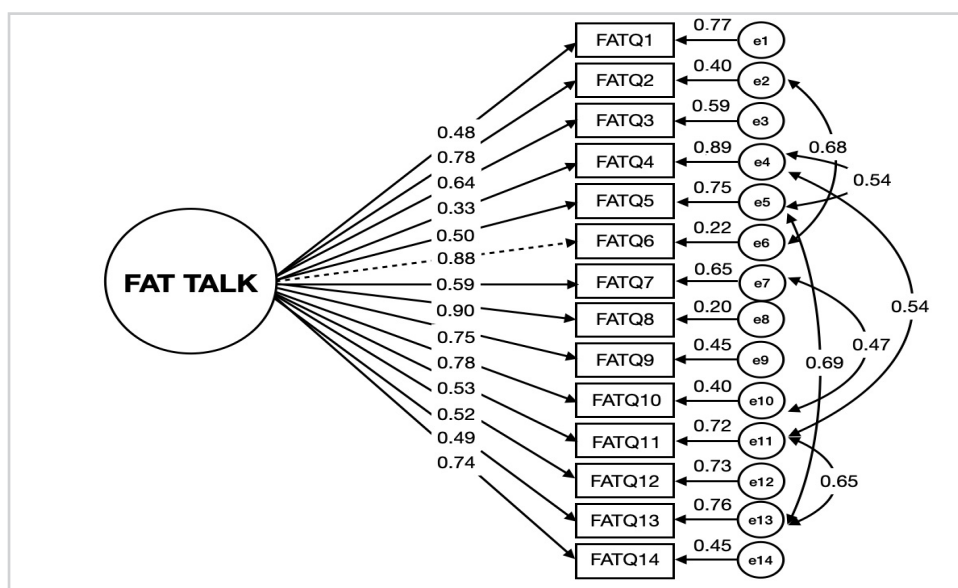
Given that all items were grouped into the same component, the CFA results can be interpreted as indicating that the Fat Talk assessed by the FTQ is a one-dimensional construct.

Examination of the Component Matrix for the retained items confirmed that, as expected, all items were loaded into a single component (as shown in table 2). Only item 4 is observed with marginal load (>0.35).

**Table 2** – Factor loadings of the Fat Talk Questionnaire (FTQ). Sao Paulo, Brazil, 2022.

| Item  | Factorial Load | Residual (standard error) |
|-------|----------------|---------------------------|
| FTQ1  | 0.48           | 0.77                      |
| FTQ2  | 0.78           | 0.40                      |
| FTQ3  | 0.64           | 0.59                      |
| FTQ4  | 0.33           | 0.89                      |
| FTQ5  | 0.50           | 0.75                      |
| FTQ6  | 0.88           | 0.22                      |
| FTQ7  | 0.59           | 0.65                      |
| FTQ8  | 0.90           | 0.20                      |
| FTQ9  | 0.75           | 0.45                      |
| FTQ10 | 0.78           | 0.40                      |
| FTQ11 | 0.53           | 0.72                      |
| FTQ12 | 0.52           | 0.73                      |
| FTQ13 | 0.49           | 0.76                      |
| FTQ14 | 0.74           | 0.45                      |

The factor loadings presented, consider the structural equation model (SEM) which pointed out covariances between the following questions seen in Figure 1 of the structural equation model. Covariance of items 2 and 6 that refer to being fat or having a fat body part: “... I complain that my belly is fat” and “... I complain that I am fat”; of items 5 and 13 that refer to hatred and repulsion for the body: “...I complain that I hate my whole body” and “...I complain that my body is disgusting/disgusting”; and of items 7 and 10 that are related to eating and the reflection on the body: “... I complain that I shouldn't eat fattening foods” and “... I complain that I need to stop eating a lot”. The interpretation of these findings is that Fat Talk, as assessed by the FTQ, is a unique construct and that various types of Fat Talk (e.g. related to body parts, related to body repulsion, weight gain) are part of this single dimension.



**Figure 1** – Factor loadings and covariances between items.

The following values were found in the CFA for the adjustment indices:  $\chi^2/df = 1.62$ ; CFI = 0.953; TLI = 0.939, and RMSEA = 0.079 [95% CI: 0.051-0.176], which support the one-dimensionality of the FTQ.

As for internal consistency, the instrument presented a Cronbach's Alpha of 0.89 and McDonald's Omega of 0.89. Average variance extracted (AVE) of 0.43 and composite reliability (CR) of 0.91 were observed.

The values obtained in the correlation analysis are shown in Table 3. There is a positive and strong correlation between the FTQ and BSQ8, and a moderate correlation between the FTQ and RSS. A moderate correlation was also found between FTQ and BMI (and BMI and BSQ8), and between BSQ8 and RSS.

**Table 3** – Correlation between Fat Talk Questionnaire (FTQ), Body Shape Questionnaire (BSQ-8) and Rosenberg Self-Esteem Scale (RSS) and Body Mass Index (BMI) scores in the assessment of young women (N =99). São Paulo Brazil. 2022

|            |             | FTQ     | BSQ     | RSS   | BMI |
|------------|-------------|---------|---------|-------|-----|
| <b>FTQ</b> | Pearson's r | —       |         |       |     |
|            | p-value     | —       |         |       |     |
| <b>BSQ</b> | Pearson's r | 0.70*** | —       |       |     |
|            | p-value     | <0.001  | —       |       |     |
| <b>RSS</b> | Pearson's r | 0.42*** | 0.42*** | —     |     |
|            | p-value     | <0.001  | <0.001  | —     |     |
| <b>BMI</b> | Pearson's r | 0.61*** | 0.53*** | 0.17  | —   |
|            | p-value     | <0.001  | <0.001  | 0.088 | —   |

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

## DISCUSSION

The present study evaluated the psychometric properties of the Fat Talk Questionnaire in a preliminary way in a group of young Brazilian women. We considered this a preliminary assessment, since the instrument was recently adapted cross-culturally for the Brazilian population, but with a focus on adolescents.

As it was adapted in Brazil for adolescents, the instrument's items are easy to understand, and we do not believe that there are conceptual, semantic, or grammatical issues that are different for young people - in any case, according to the WHO, adolescence can be considered up to 19 years of age. years 11 months and 30 days.

The mean score found in the present study is similar to the study by Rogers *et al.*<sup>20</sup>, in which they evaluated the FT behavior of 120 women aged 17 to 25 years, correlating it with that of their mothers and friends (mean 31.39; SD 12.85). In The Body Project<sup>11</sup> study, with 112 teens aged 15 to 18 years old, and in the study by Dalley<sup>45</sup>, with 120 women aged 17 to 39 years old, the mean score values were lower than

ours (mean 26.08, SD 10.36; and mean 27.82, SD 9.2) The higher frequency of responses to the most practiced behaviors (response options: always or often) were related to complaining to friends about not being in shape, having a belly fat, and needing to stop eating a lot - typical of the description of the Fat Talk phenomenon<sup>1-8;46</sup>. On the other hand, the highest frequency of response never occurred for item 13, which describes a behavior of body depreciation more than simply dissatisfaction with the body shape.

It is important to emphasize that each study, when applying an instrument, must assess its psychometric properties, and even perform a CFA when there is a factorial structure proposed by the original instrument - which was the case herein.

It is noteworthy that, after statistical adjustments, through the CFA, the one-dimensionality of the FTQ was confirmed by the authors of the original instrument<sup>13</sup>.

The internal consistency of the FTQ was adequate by the two indices used (0.89 according to Cronbach's Alpha and 0.92 for McDonald's

Omega). Cronbach's Alpha value found for the original instrument was 0.94013 and four other studies that used the FTQ in young women also found 0.93<sup>20</sup>; 0.91<sup>43</sup> and 0.91<sup>11</sup>, respectively, – all of which were considered satisfactory and are similar to that observed in the present study.

It was possible to confirm the convergent validity of the instrument in this sample, and also the convergence with dissatisfaction with body shape and self-esteem – as proposed by the literature<sup>9;12;47-51</sup>. It was observed that the greater the dissatisfaction with the body, the greater the FT behavior, confirming the hypothesis of a relationship between the constructs – already widely discussed in the literature – and using the FTQ<sup>20,46</sup> (as well as various instruments to assess body issues). Several other studies that evaluated Fat Talk behavior using other instruments also showed a correlation with body dissatisfaction in young women<sup>3,8,49-50</sup>.

There are three meta-analyses that identified a positive relationship between Fat Talk behavior and body dissatisfaction, especially in older adolescents<sup>8</sup> (public similar to the present study), in which the first of them selected 24 studies from 2003 to 2013, in its majority composed of women and adolescents, residing mainly in the United States, Australia, and China. Subsequently, a second review on Fat Talk found 19 more articles since 2013 and added up to 43 studies on the topic, with greater engagement in Fat Talk and greater dissatisfaction with body shape appearing mainly positive in American university students<sup>38</sup>. Finally, in the most recent review on the subject, with 35 studies, a positive correlation was also found between Fat Talk and body dissatisfaction, body shame, perceived pressure for thinness, and greater body checking<sup>5</sup>.

The first and second meta-analyses mentioned above also showed a negative correlation between body dissatisfaction and higher self-esteem<sup>8,38</sup>. Our findings corroborate these data, since there was a positive correlation between the BSQ8 score and worse self-esteem,

as well as between the FTQ and worse self-esteem. Although research has demonstrated the relationship between Fat Talk behavior – assessed through other questionnaires and self-esteem<sup>9,39</sup> – as far as we know, this is the first study that sought to investigate this relationship with the application of the FTQ instrument.

As young women are at greater risk and are more vulnerable to the development of body dissatisfaction and lower self-esteem due to social and biological factors<sup>48-50</sup>, and as the incidence of low self-esteem can be high in this context<sup>51</sup>, to investigate the relationship between dissatisfaction with body and Fat Talk is relevant in this study.

The literature points to a negative correlation between body dissatisfaction and self-esteem<sup>47-51</sup> which was also identified in the present study, justifying the analysis and results of this convergent validity analysis. According to our findings, the positive correlation of the FTQ with BMI was also confirmed, reinforcing the results indicated by the literature, in which body dissatisfaction is higher among individuals with a higher BMI<sup>52-57</sup> who in turn had a higher FTQ score.

In the recent study by Ahuja, Khandelwal, and Banerjee (2021)<sup>55</sup>, with 265 Indian women aged 15 to 50 years old, the correlations between younger age, greater weight, and Fat Talk behavior, using the FTQ, were positively correlated with body dissatisfaction (assessed by the BSQ).

National studies show high rates of body dissatisfaction among female adolescents and young women. Fortes *et al.* (2014)<sup>58</sup> found a positive correlation between dissatisfaction with body shape (assessed by the BSQ) and nutritional status in 397 girls aged 12 to 17 years old in Minas Gerais, and the correlation with self-esteem (using the RSS) confirmed the correlation with body image dissatisfaction, but not with BMI.

In Brazil, studies on the frequency of Fat Talk behavior and its relationships have not yet been identified; therefore, there is a need for an instrument with validated data and evaluated psychometric properties to explore behavior in



the national population. This is especially due to the high frequency of body dissatisfaction among young female audiences<sup>58</sup> and the adverse consequences of body image problems, such as worse eating behavior and increased risk for eating disorders<sup>59-60</sup>, low self-esteem, and depression, notably in adolescents<sup>60</sup>.

Even following all the guidelines for psychometric assessment, this work has as a limitation its use in a non-probabilistic sample, quite homogeneous in terms of age and sociodemographic profile, of undergraduate students in Nutrition. Thus, it is recommended that future works explore the psychometric characteristics of the FTQ in samples with a greater age range and with greater

heterogeneity in terms of sociocultural aspects. The sample used for this evaluation is of university students, undergraduate students in nutrition, from a single institution in the city of São Paulo, SP, which limits the interpretation of data to this sample and makes this evaluation preliminary.

Despite the limitations pointed out, having an instrument available and adapted allows for new explorations of the Fat Talk phenomenon. Knowing the prevalence of body dissatisfaction among young women and its deleterious consequences, addressing Fat Talk behavior in intervention studies to prevent problems with body image, eating behavior and self-esteem can be considered of great relevance.

## CONCLUSION

The analysis of the psychometric properties of the FTQ for the context of young females showed satisfactory results for internal consistency and construct validity, correlation with greater concern with body shape and worse self-esteem, and the confirmatory factor analysis supported a one-dimensional instrument with satisfactory factorial loadings.

The results obtained by performing the psychometric analysis of the FTQ, in the sample proposed in this study, provide relevant information, as well as access to an instrument that assesses the frequency of this behavior.

Furthermore, this study highlights the impor-

tance of attention to behaviors (speech, thoughts, and feelings about one's own body) that precede unhealthy practices to control body shape and weight. Since these are associated with greater concern with body shape and self-esteem, both constructs are extensively related in the literature with eating disorders.

Therefore, this study presented an instrument that can be used in a young female public in Brazil, for further exploration of the Fat Talk construct, so that the impacts of this behavior can also be evaluated towards the perceptions of young women about body satisfaction and self-esteem.

## Author Statement CRediT

Conceptualization: Vignoli NG, Alvarenga MS, Ganen AP. Methodology: Vignoli NG, Alvarenga MS, Muzy RC, Ganen AP. Validation: Vignoli NG, Alvarenga MS, Muzy RC, Ganen AP. Statistical analysis: Vignoli NG, Muzy RC. Formal analysis: Vignoli NG, Alvarenga MS, Muzy RC, Ganen AP. Research: Vignoli NG, Alvarenga MS, Ganen AP. Writing-revision and editing: Vignoli NG, Alvarenga MS, Muzy RC, Ganen AP. Visualization: Vignoli NG, Alvarenga MS, Muzy RC, Ganen AP. Orientation: Alvarenga MS, Ganen AP. Project management: Vignoli NG, Alvarenga MS, Ganen AP.

All authors have read and agreed with the published version of the manuscript.

## REFERENCES

1. Nichter M, Vuckovic N. Fat talk: Body image among adolescent girls. In: Many mirrors. N. Sault: New Brunswick, NJ: Rutgers University Press, 1994. pp. 109–131.
2. Nichter M. Fat talk: What girls and their parents say about dieting. Cambridge, MA: Harvard University Press, 2000.
3. Takamura A, Yamazaki Y, Omori M. Developmental changes in fat talk to avoid peer rejection in Japanese girls and young women. *Health Psychol Open*. 2019; 6(1):2055102919854170. <http://doi.org/10.1177/2055102919854170>.
4. Lydecker JA, Riley KE, Grilo CM. Associations of parents' self, child, and other "fat talk" with child eating behaviors and weight. *Int J Eat Disord*. 2018; 51(6):527-534. <http://doi.org/10.1002/eat.22858>.
5. Mills J, Fuller-Tyszkiewicz M. Fat talk and its relationship with body image disturbance. *Body Image*. 2016; 18:61-64. <http://doi.org/10.1016/j.bodyim.2016.05.001>.
6. Ousley L, Cordero ED, White S. Fat talk among college students: how undergraduates communicate regarding food and body weight, shape & appearance. *Eat Disord*. 2008; 16(1):73-84. <http://doi.org/10.1080/10640260701773546>
7. Salk RH, Engeln-Maddox R. "If You're Fat, Then I'm Humongous!": Frequency, Content, and Impact of Fat Talk Among College Women. *Psychol Women Q*. 2011;35(1):18–28. <https://doi.org/10.1177/0361684310384107> Sharpe H, Naumann U, Treasure J, Schmidt U. Is fat talking a causal risk factor for body dissatisfaction? A systematic review and meta-analysis. *Int J Eat Disord*. 2013;46(7):643-652. <http://doi.org/10.1002/eat.22151>
8. Arroyo A, Harwood J. Exploring the Causes and Consequences of Engaging in Fat Talk. *J Appl Commun Res*. 2012; 40(2): 167-187. <http://doi.org/10.1080/00909882.2012.654500>
9. Guertin C, Barbeau K, Pelletier L, Martinelli G. Why do women engage in fat talk? Examining fat talk using Self-Determination Theory as an explanatory framework. *Body Image*. 2017;20:7-15. <http://doi.org/10.1016/j.bodyim.2016.10.008>
10. Webb JB, Rogers CB, Etzel L, Padro MP. "Mom, quit fat talking-I'm trying to eat (mindfully) here!": Evaluating a sociocultural model of family fat talk, positive body image, and mindful eating in college women. *Appetite*. 2018; 126:169-175. <http://doi.org/10.1016/j.appet.2018.04.003>
11. Vanderkruik R, Conte I, Dimidjian S. Fat talk frequency in high school women: Changes associated with participation in the Body Project. *Body Image*. 2020; 34:196-200. <http://doi.org/10.1016/j.bodyim.2020.06.002>
12. Royal S, Macdonald DE, Dionne MM. Development and validation of the Fat Talk Questionnaire. *Body Image*. 2013; 10(1):62-69. <http://doi.org/10.1016/j.bodyim.2012.10.003>
13. Becker CB, Diedrichs PC, Jankowski G, Werchan C. I'm not just fat, I'm old: has the study of body image overlooked "old talk"? *J Eat Disord*. 2013; 1:6. Published 2013 Feb 21. <http://doi.org/10.1186/2050-2974-1-6>
14. Sladek MR, Engeln R, Miller SA. Development and validation of the Male Body Talk Scale: a psychometric investigation. *Body Image*. 2014;11(3):233-244. <http://doi.org/10.1016/j.bodyim.2014.02.005>
15. MacDonald DE, Dimitropoulos G, Royal S, Polanco A, Dionne MM. The Family Fat Talk Questionnaire: development and psychometric properties of a measure of fat talk behaviors within the family context. *Body Image*. 2015; 12:44-52. <http://doi.org/10.1016/j.bodyim.2014.10.001>
16. Engeln-Maddox R, Salk RH, Miller SA. Assessing Women's Negative Commentary on Their Own Bodies: A Psychometric Investigation of the Negative Body Talk Scale. *Psychol Women Q*. 2012; 36(2): 162–178.
17. Lin L, Flynn M, O'Dell D. Measuring positive and negative body talk in men and women: The development and validation of the Body Talk Scale. *Body Image*. 2021; 37: 106-116. <http://doi.org/10.1016/j.bodyim.2021.01.013>
18. Warren CS, Holland S, Billings H, Parker A. The relationships between fat talk, body dissatisfaction, and drive for thinness: perceived stress as a moderator. *Body Image*. 2012; 9(3):358-364. <http://doi.org/10.1016/j.bodyim.2012.03.008>
19. Lin L, Soby M. Appearance comparisons styles and eating disordered symptoms in women. *Eat Behav*. 2016; 23:7-12. <http://doi.org/10.1016/j.eatbeh.2016.06.006>
20. Rogers CB, Martz DM, Webb RM, Galloway AT. Everyone else is doing it (I think): The power of perception in fat talk. *Body Image*. 2017; 20:116-119. <http://doi.org/10.1016/j.bodyim.2017.01.004>
21. Sutin AR, Terracciano A. Personality and the Social Experience of Body Weight. *Pers Individ Dif*. 2019; 137:76-79. <http://doi.org/10.1016/j.paid.2018.08.007>
22. Sladek MR, Salk RH, Engeln R. Negative body talk measures for Asian, Latina(o), and White women and men: Measurement equivalence and associations with ethnic-racial identity. *Body Image*. 2018; 25:66-77. <http://doi.org/10.1016/j.bodyim.2018.02.005>
23. MacDonald Clarke P, Murnen SK, Smolak L. Development and psychometric evaluation of a quantitative measure of "fat talk". *Body Image*. 2010; 7(1):1-7. <http://doi.org/10.1016/j.bodyim.2009.09.006>
24. Mckinley NM, Hyde JS. The objectified body consciousness scale: development and validation. *Psychol Women Q*. 1996; 20:181–215.
25. Silva GCA, Ganen AGP, Alvarenga MS. Adaptação transcultural do Fat Talk Questionnaire para o Português do Brasil. *Rev Bras Epidemiol*. 2021; 24; e210051 <https://doi.org/10.1590/1980-549720210051>.
26. Hair Jr. JF, Black WC, Babin BJ, et al. Multivariate data analysis (6<sup>th</sup> ed.). Up Saddle River, NJ: Pearson Prentice Hall. 2009.
27. De Onis M, Onyango AW, Borghi E, Nishida ASC, Siekmann J. Development of a WHO growth reference for school-aged children and adolescents. *Bull World Health Organ*. 2007; (85(9):660-667. <https://doi.org/10.2471/BLT.07.043497> Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behav Res Methods*. 2009; 41(4):1149–1160. <http://doi.org/10.3758/bf03193146>
28. Silva WR, Costa D, Pimenta F, Maroco J, & Campos JADB. Psychometric evaluation of a unified Portuguese-language version of the Body Shape

- Questionnaire in female university students. *Cadernos de saúde publica*. 2016; 32, e00133715. <https://doi.org/10.1590/0102-311X00133715>.
29. Sbicigo JB, Bandera DR, Dell'anglio DD. Escala de Autoestima de Rosenberg (EAR): validade fatorial e consistência interna. *Psico-USF*; 2010; 15(3): 395-403. <https://doi.org/10.1590/S1413-82712010000300012>
30. Dini GM, Quaresma MR, Ferreira LM. Adaptação Cultural e Validação da Versão Brasileira da Escala de Auto-estima de Rosenberg. *Rev. Bras. Cir. Plást.*2004;19(1):41-52.
31. Kline RB. *Principles and Practice of Structural Equation Modeling*. New York: The Guilford Press; 2012.
32. Marôco J. *Análise de Equações Estruturais: Fundamentos teóricos, Software e Aplicações*. Pêro Pinheiro: Report Number, 2010.
33. Efronb, (1982). The jackknife, the bootstrap and other resampling plans. Society for Industrial and Applied Mathematics CBMS-National Science Foundation Monograph, 38.
34. Hair JF Jr; Anderson RE; Tatham RI. Black, W. C. *Multivariate Data Analysis*. 6th edn. Prentice Hall, Upper Saddle River, 2005.
35. Hu LT, Bentler PM. Cutoff Criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *structural. Structural Equation Modeling*. 1999; 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>
35. Maroco J. *Análise de equações estruturais: Fundamentos teóricos, software e aplicações*. 3. ed., 2014.
36. Martins BG, da Silva WR, Maroco J, Campos JADB. Psychometric characteristics of the Three-Factor Eating Questionnaire-18 and eating behavior in undergraduate students. *Eat Weight Disord*. 2021; 26(2):525-536. doi:10.1007/s40519-020-00885-9
37. Hair Jr, Joseph F, Marcelo LDS Gabriel, and Vijay K. Patel. "Modelagem de Equações Estruturais Baseada em Covariância (CB-SEM) com o AMOS: Orientações sobre a sua aplicação como uma Ferramenta de Pesquisa de Marketing." *Revista Brasileira de Marketing*. 2014; 13(2): 44-55.
38. Rudiger JA, Winstead BA. Body talk and body-related co-rumination: associations with body image, eating attitudes, and psychological adjustment. *Body Image*. 2013;10(4):462-471. <http://doi.org/10.1016/j.bodyim.2013.07.010>
39. Beato-Fernández L, Rodríguez-Cano T, Belmonte-Llario A, Martínez-Delgado C. Risk factors for eating disorders in adolescents. A Spanish community-based longitudinal study. *Eur Child Adolesc Psychiatry*. 2004;13(5):287-294. <http://doi.org/10.1007/s00787-004-0407-x>
40. Dancey C, Reidy J. *Estatística Sem Matemática para Psicologia: Usando SPSS para Windows*. Porto Alegre, Artmed. 2006.
41. Terwee CB, Bot SD, de Boer MR, et al. Quality criteria were proposed for measurement properties of health status questionnaires. *J Clin Epidemiol*. 2007;60(1):34-42. <http://doi.org/10.1016/j.jclinepi.2006.03.012>
42. Hora HRM, Monteiro GTR, Arica J. Confiabilidade em questionários para qualidade: um estudo com o coeficiente Alfa de Cronbach. *Produto Produção*; 2010; 11(2):85-103.
43. Ferrando PJ. & Lorenzo-Seva U. Assessing the Quality and Appropriateness of Factor Solutions and Factor Score Estimates in Exploratory Item Factor Analysis. *Educational and Psychological Measurement*, 2018; 78(5): 762–780. <https://doi.org/10.1177/0013164417719308>
44. Nunnally JC, Bernstein IH. *Psychometric theory*. 3rd ed. New Yourk: McGraw-Hill, 1994.
- 45- Dalley SE, Toffanin P, Libert J, Vidal J. Fat Talk in College Women: A Response Styles Perspective. *Health Educ Behav*. 2022; 49(6):1014-1021. <http://doi.org/10.1177/10901981211008818>
46. Lin L, Soby M. Is listening to fat talk the same as participating in fat talk?. *Eat Disord*. 2017;25(2):165-172. <http://doi.org/10.1080/10640266.2016.1255106>
47. Souza AC, Alvarenga M. Insatisfação com a imagem corporal em estudantes universitários – uma revisão integrativa. *J Bras Psiquiatr*. 2016; 65(3): 286–299. <http://doi.org/10.1590/0047-2085000000134>
48. Corning AF, Gondoli DM. Who is most likely to fat talk? A social comparison perspective. *Body Image*. 2012;9(4):528-531. <http://doi.org/10.1016/j.bodyim.2012.05.004>
49. Compeau A, Ambwani S. The effects of fat talk on body dissatisfaction and eating behavior: the moderating role of dietary restraint. *Body Image*. 2013;10(4):451-461. <http://doi.org/10.1016/j.bodyim.2013.04.006>
50. Dunkel TM, Davidson D, Qurashi S. Body dissatisfaction: ethnic and gender differences across Chinese, indo-asian and European-discent students. *Eat Disord*.2004; 12(4): 321-336.
51. Goswami S, Sachdeva S, Sachdeva R. Body image satisfaction among female college students. *Ind Psychiatry J*. 2012;21(2):168-172. <http://doi.org/10.4103/0972-6748.119653>
52. Kennedy E. Dietary diversity, diet quality, and body weight regulation. *Nutr Rev*. 2004;62(7 Pt 2):S78-S81. <http://doi.org/10.1111/j.1753-4887.2004.tb00093.x>
53. Silva AMBD Machado WDL, Bellodi AC, Cunha KSD, & Enumo SRF. Jovens insatisfeitos com a imagem corporal: estresse, autoestima e problemas alimentares. *Psico-USF*. 2018; 23: 483-495.
54. Paxton SJ, Neumark-Sztainer D, Hannan PJ, Eisenberg ME. Body dissatisfaction prospectively predicts depressive mood and low self-esteem in adolescent girls and boys. *J Clin Child Adolesc Psychol*. 2006;35(4):539-549. [http://doi.org/10.1207/s15374424jccp3504\\_5](http://doi.org/10.1207/s15374424jccp3504_5)
55. Ahuja KK, Khandelwal A, Banerjee D. RETRACTED: 'Weighty woes': Impact of fat talk and social influences on body dissatisfaction among Indian women during the pandemic [published online ahead of print, 2021 Feb 4] [retracted in: *Int J Soc Psychiatry*. 2021 Nov 26;:207640211063062]. *Int J Soc Psychiatry*. 2021;20764021992814. <http://doi.org/10.1177/0020764021992814>
56. Alves E, Vasconcelos FAG, Calvo MCM, Neves J. Prevalência de sintomas de anorexia nervosa e insatisfação com a imagem corporal em adolescentes do sexo feminino do Município de Florianópolis, Santa Catarina, Brasil. *Cad Saúde Públ*. 2008; 24(3): 503–512. <https://doi.org/10.1590/S0102-311X2008000300004>
57. Castro IR, Levy RB, Cardoso Lde O, et al. Imagem corporal, estado nutricional e comportamento com relação ao peso entre adolescentes brasileiros [Body image, nutritional status and practices for weight control among Brazilian adolescents].

Cien Saude Colet. 2010;15 Suppl 2:3099-3108. <http://doi.org/10.1590/s1413-81232010000800014>

58. Fortes Lde S, Cipriani FM, Coelho FD, Paes ST, Ferreira ME. A autoestima afeta a insatisfação corporal em adolescentes do sexo feminino? [Does self-esteem affect body dissatisfaction levels in female adolescents?]. Rev Paul Pediatr. 2014;32(3):236-240. <http://doi.org/10.1590/0103-0582201432314>

59. Kessler AL, Poll FA. Relationship between body image, attitudes towards eating disorders and nutritional status in university students in the health area. J Bras Psiquiatr. 2018; 67(2): 118-125. <https://doi.org/10.1590/0047-2085000000194>

60. Rentz-Fernandes AR, Silveira-Viana M, Liz CM, Andrade A. Autoestima, imagem corporal e depressão de adolescentes em diferentes estados nutricionais. Rev Salud Publica. 2017; 19(1): 111-120. <https://doi.org/10.15446/rsap.v19n1.47697>

Submitted: 23 november 2021.  
Approved: 10 november 2022.  
Published: 21 december 2022.