

Development and Psychometric Study of a Persian Version of the Body Image Questionnaire for Individuals With Gender Dysphoria

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Abstract- Body dissatisfaction is a major concern among individuals with gender dysphoria, for the assessment of which psychometric tools with appropriate reliability and validity are needed. This study aimed (1) to translate and culturally adapt both gender versions of the English-language “Body Image and Satisfaction Questionnaire” (BIQ-M and BIQ-F: Meyer-Bahlburg, 2008) into Persian and (2) to conduct a psychometric validation study of the Persian versions. After translation and cultural adaptation, content and face validity were assessed. A total score for each gender version was calculated by summing responses to Likert-scaled dissatisfaction items. The Dissatisfaction Scales were analyzed for internal consistency (Cronbach’s alpha) and discriminant validity in a sample of 51 individuals with gender dysphoria (25 transgender women, 26 transgender men) and 43 cisgender individuals (20 men, 23 women). Group differences were examined using t-tests and ANCOVA. Explanatory factor analysis has been used to assess the construct validity of the questionnaires. Cronbach’s alpha coefficients for the Dissatisfaction Scales of BIQ-M and BIQ-F were 0.931 and 0.948, respectively. EFA showed four domains for each BIQ-M and BIQ-F questionnaires, describing more than 75% of the variations. Transgender participants scored significantly higher on the scales than cisgender controls ($P < 0.001$). Item-level analyses confirmed these differences, and ANCOVA showed no significant confounding effect of age. The Persian versions of the BIQ-M and BIQ-F demonstrated excellent reliability and plausible construct and criterion validities, thus making them suitable for clinical and research use among Persian-speaking individuals with gender dysphoria.

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Introduction

Gender dysphoria (GD) is characterized by significant distress related to the “incongruence between one’s experienced/expressed gender and assigned gender” (1).

Several studies have shown that individuals with gender dysphoria often have a negative general body image and are particularly dissatisfied with the sex-specific physical characteristics associated with their apparent biological sex, which is the basis for the sex category entered in the

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birth certificate (2,3). Body image disturbances are therefore considered a core component of gender dysphoria (4).

Given the findings reported above, measuring body image concerns is an essential part of assessment and treatment planning for gender dysphoria, and there is a need for reliable and valid assessment tools that are appropriately adapted for different cultural contexts. the Hamburg Body Drawing Scale is one of these tools has been developed and tested for the psychometric properties (5). Other questionnaires to assess body dissatisfaction in individuals with gender dysphoria include Body Image Scale for Gender Dysphoria (BIS) (6,7), and the Transgender Congruence Scale (4).

A “Body Image and Satisfaction Questionnaire” (BIQ) was designed for single-item analysis in studies of individuals with diverse forms of somatic intersexuality by Meyer-Bahlburg (8). One advantage of the BIQ compared to other similar questionnaires is that it includes more questions about the genital area. Considering the item content and format, it seems that this questionnaire can also be used for assessing the body image of individuals with GD.

In female version (BIQ-F) it includes a total of 48 items. Twenty of this use 5-point Likert scales from 5=Very satisfied to 1=Very dissatisfied (example: “with your height”). The other 28 items use 2-point scales: 26 use Yes/No (example: “your height-too tall”), and two use Present/absent (example: “clitoris”). In male version (BIQ-M) it includes a total of 49 items. Nineteen of these use 5-point Likert scales as described above, 27 Yes/No, one Present/absent (for “penis”), and two 3-point scales (“breast development”: 0=No breasts, 1=Small breasts, 2=Large breasts; “Testes are”: 0=Both absent, 1=Only one present, 2=Both present).

Few research studies have been conducted to assess body image in individuals with gender dysphoria in Iran (9,10). Availability of culturally adapted tools is crucial for understanding body image concerns within the sociocultural context of Iran and monitoring treatment outcomes in Persian-speaking patients. Using existing assessment tools in this domain from other countries is desirable to speed up the process of assessment development. However, direct translation of questionnaires into different languages does not necessarily retain semantic, conceptual, and normative equivalence (11). The process of cross-cultural adaptation seeks to maximize content validity and ensure that the adapted version assesses the same construct in the target population.

The present report is part of a comprehensive project

aiming at the development of a set of reliable and valid Persian questionnaires for the psychiatric assessment of Iranian individuals with gender dysphoria.

In this paper, we report on our work on the Persian versions of the BIQ-F and the BIQ-M.

The goals of the present study are (1) to describe the translation of both gender versions (BIQ-F and BIQ-M) of the “Body Image and Satisfaction” questionnaire into Persian, (2) to introduce Dissemination scales based on the sum of the Likert-scaled items of these questionnaires, and (3) to determine the reliability and validity of these Dissemination scales in an Iranian pilot study of (non-intersex) individuals either with gender dysphoria or without gender dysphoria.

Materials and Methods

Translating (with modifications) both BIQ-F and BIQ-M into Persian and establishing content and face validity for each

Translation and back translation

Both English-language questionnaires were fully translated into Persian by two bilingual (Persian-English) translators. One of them performed the first translation, then the second translator compared the first version of the translation to the original English version and revised it. This version of the translation was finalized based on the consensus of both translators’ opinions.

Then, 10 psychiatrists and clinical psychologists who are university faculty members, experts compared the translation of all parts of the questionnaire to the original text in terms of the correctness and precision of the translation. Cultural adaptations were also carried out by this group. While attempts were made to retain the original meaning of the items, some modifications were implemented to adapt culturally.

Besides, to ensure the conceptual equivalence of the Persian-language questionnaire with the English-language original, we sent the initially translated files to five experts. For each item, if all experts agreed on the equivalence, the translation was accepted. If any disagreements occurred, the translated phrases were adapted according to the experts’ suggestions until total agreement of the experts was reached for each translated item.

Finally, back translation into English was done. This back-translated version was emailed to the designer of the original English questionnaire, and the final Persian version was edited according to his recommendations.

For the Persian version, we reversed the 5-point Likert scales, now indicating 1=Very satisfied to 5=Very

dissatisfied. In addition, we defined for each BIQ version a “Dissatisfaction Scale”, namely, the sum of an individual’s Likert-scaled dissatisfaction ratings (20 items in the BIQ-F and 19 items in the BIQ-M).

Content validity

Determination of the content validity of an assessment instrument involves its formal evaluation by topic experts regarding the appropriateness of its content, including the identification of omissions and of formulations possibly causing misunderstanding. So, to assess the cross-cultural appropriateness of the translated questionnaire, several types of equivalence were considered: a) ensuring the clarity and relevance of the questions for Persian-speaking individuals (semantic equivalence); b) evaluating the appropriateness of the questions for patients (technical equivalence); and c) ensuring the questions’ relevance and appropriateness for the target culture (content equivalence) (12).

This step involved one methodologist and 10 mental-health professionals meeting the following criteria: having a minimum qualification for a psychiatry specialty (n=8) or a PhD degree in clinical psychology (n=2), at least two years of experience working with transgender individuals (F to M or M to F) in research, clinical, or hospital settings, and being familiar with the process of assessment-instrument development.

These experts assessed the questions for appropriate language, clarity, and relevance to Persian culture, and with providing suggestions for item modification. Based on their feedback, some item modifications were implemented by the principal investigator.

After that, the revised questionnaires were assessed by the same expert group regarding to calculate each item’s Content Validity Ratio (CVR), in which each item’s necessity, usefulness, or redundancy was measured.

Formula 1:

$$(CVR = \frac{n - (\frac{N}{2})}{\frac{N}{2}})$$

(n is the number of panelists indicating “essential” and N is the total number of panelists)

Subsequently, the 11 experts evaluated each item for relevance. Then, the Content Validity Index (CVI) was calculated for each item as well as for the entire questionnaire. CVRs and CVIs more than 0.7 were deemed statistically acceptable (13).

Formula 2:

$$(CVI = \frac{\text{number of raters giving a rating of 3 or 4}}{\text{Total number of raters}})$$

Face validity

Face validity is determined by an informal review of a questionnaire by non-experts, who assess its clarity, comprehensibility, and appropriateness for the target group, and whether questionnaire items do indeed represent the issue they are supposed to evaluate. In the first step, 10 unmarried clients diagnosed with Gender Dysphoria (n=5 M to F, and n=5 F to M), aged 19 to 24 years (mean age 22.03) with educational backgrounds ranging from high school diploma to bachelor’s degree, were asked to appraise the items regarding their appropriateness, formulation problems, sentence structure, and understandability, using a 5-point Likert scale from 1=Strongly disagree to 5=Strongly agree. Then, all items were analyzed for their percentages of 4 and 5 (“agree” and “strongly agree”) ratings obtained; percentages >80% were considered to indicate acceptable validity. This analysis showed that all 10 clients judged all BIQ items as appropriately representing the issues they were supposed to assess and as having been clearly formulated.

Psychometric study of the BIQ-F and BIQ-M

Internal consistency and discriminant validity

Internal consistency and discriminant validity have been assessed for the two Dissatisfaction Scales (BIQ-M and BIQ-F) based on the samples of clients with and without gender dysphoria. Clients for this analysis have been selected from a cross-sectional study performed during 2018 to 2021 at hospitals affiliated with the Tehran University of Medical Sciences, Shahid Beheshti University of Medical Sciences, and Iran University of Medical Sciences.

Participants

The study included four groups: two groups including adults with gender dysphoria (GD groups)-one of transgender women and the other of transgender men; and two groups including adults without gender dysphoria (cisgenders or control groups)-also one of women and the other of men.

The source of GD-group participants was the three hospitals, which are referral centers for clients with gender dysphoria in Tehran. Eligibility criteria were: Having been diagnosed with GD by a board-certified psychiatrist, being between 18 and 45 years old, and being a native Persian speaker. Exclusion criteria were: Serious difficulties in behavior, communication, and speaking in a way that the person could not be interviewed, (for example due to mental disability, schizophrenia, or serious agitation, and self-reported

alcohol/substance or illegal-drug dependency) which were assessed via interview by a psychiatrist or a clinical psychologist, and any medical treatment for GD (which could affect the body image ratings).

The control group was selected from Persian-speaking volunteers without gender dysphoria who were group-matched to the GD-group participants according to age, gender, and educational level. These volunteers were working at hospitals other than those three listed previously for GD clients' selection, and some were relatives of GD-group participants. The same inclusion (except for the diagnosis of gender dysphoria) and exclusion criteria were applied for them as for the GD group by a psychiatrist or clinical psychologist.

Study procedures

The participants were asked to complete the BIQ as part of a battery of written questionnaires in the presence of a research assistant, who was available to answer any questions the participants had about the questionnaires.

Statistical analysis

IBM SPSS Statistics 25 was used for statistical analysis. Psychometric analysis was limited to the total scales of the BIQ-F and BIQ-M as defined above. Dissatisfaction Scores were calculated as the sum of the scores of Likert-scale items.

Discriminant validity was assessed by the differences in Dissatisfaction Scores between the GD and Non-GD groups by an independent samples t-test. To control the confounding effect of age in Dissatisfaction Score comparisons, ANCOVA analysis was performed. The reliability of the BIQ-F and the BIQ-M was assessed in terms of internal consistency by Cronbach's Alpha (α); α coefficients above 0.9 were considered excellent.

Content Validity Index (CVI) and Content Validity Ratio (CVR) were calculated for content and face validity assessment. Explanatory factor analysis (EFA) was performed to assess the construct validity of the questionnaires. The Kaiser-Meyer-Olkin (KMO) measures above 0.7 were considered an acceptable construct validity measure. The sum of eigen loading factors up to 70% of the total variance is considered a threshold to select domains. Domain-item correlations above 0.5, according to the Rotated Component Matrix correlations were considered statistically significant for item assignments to domains.

Results

The final GD samples included 26 transgender men

(birth-assigned females) (mean age 23.04 years, SD 5.74) and 25 transgender women (birth-assigned males) (mean age 23.54 years, SD 5.90). The control groups included 23 women (mean age 29.45 years, SD 6.15) and 20 men (mean age 29.18 years, SD 6.98).

Translation and back translation

Regarding the item-level index of BIQ-M, the raters (expert group) gave number 5, which shows complete agreement, to 20 percent of the questions, and gave number 4 to 40 percent of the questions. Regarding the item-level index of BIQ-F, the expert group gave number 5 to 15 percent of the questions and gave number 4 to 65 percent of the questions.

All items in both gender versions of the questionnaire were assessed as relevant to transgender individuals (both F to M and M to F), with the CVR for each of the items as well as for the entire questionnaire exceeding 0.7.

Dissatisfaction scale of the BIQ-M

Internal consistency

Based on data from both the GD men and the cisgender men combined, the Cronbach's alpha (95% confidence intervals) (14) of the Dissatisfaction Scale of the BIQ-M was 0.931 (0.890-0.962), which indicates excellent internal consistency. As Table 1 shows, the individual dissatisfaction items differ little in their effects on the internal consistency of the Dissatisfaction Scale.

Discriminant validity

The GD men's mean score on the Dissatisfaction Scale of the BIQ-M was higher ($M=58.4$, $SD=13$) than that of the cisgender men ($M=32$, $SD=6.2$). This difference was statistically significant ($P<0.001$). The item analysis of the BIQ-M (Table 3) showed that the mean score of each item was higher (i.e., indicating more dissatisfaction) for GD men, but the difference was not statistically significant for questions B-2 (the age you look), B-5 (your height), B-8 (your weight), B-15 (your ears), B-16 (your jaw), and B-29 (your hair on your head).

Because of the statistically significant differences of age between the GD men and the control men, a respective ANCOVA was performed. The results (Table 4) showed no confounding effect of age on the group differences in dissatisfaction.

Explanatory factor analysis of BIQ-M

According to the analysis, the KMO measure was 0.719 ($P<0.001$), which indicates acceptable construct validity of the scale. Almost all items have extraction factors above 0.5 to assign them to a domain (Table 7).

Four different domains could explain more than 70 percent of the variance in the whole scale (Table 8). According to the Rotated Component Matrix correlations, in the first domain (Male Primary and Secondary Sexual Characteristics): items B-1: the overall appearance of your body, B-20: your body hair (on chest, back, arms, legs), B-23: your pubic hair, B-26: your facial hair (on chin, upper lip), B-34: your chest development, B-36: appearance of your genitals overall, B-43 appearance of your scrotum and B-46 testes; in the second domain (General body and Facial Features): items B-5: your height, B-11: your voice, B-14: your forehead, B-15: your ears, B-16: your Jaw and B-17: your hands; in the third domain (Body Composition and Muscularity): items B-8: your weight and B-31: your muscular development and in the fourth domain (Perceived Age and Hair Appearance): items B-2: the age you look and B-29: your hair on your head have been selected (Table 9 and 10).

Dissatisfaction scale of the BIQ-F

Internal consistency

Based on data from both the GD women and the cisgender women combined, the Cronbach's alpha (95% confidence interval) (14) of the Dissatisfaction Scale of the BIQ-F was 0.948 (0.918-0.971), which indicates again excellent internal consistency like the BIQ-M.

Discriminant validity

The GD women's mean score on the Dissatisfaction Scale of the BIQ-F was statistically higher ($M=72.3$, $SD=8.7$) than that of the cisgender women ($M=41.3$, $SD=12.7$) ($P<0.001$). Similarly to the BIQ-M, in item analysis of the questionnaire, although the mean score per each item was higher for all items, (showing more dissatisfaction in Cisgender group) but in questions; B-

14: your forehead, B-15: your ears, B-20: your body hair (on chest, back, arms, legs), B-23: your pubic hair and B-29: your hair on your head, the differences were not statistically significant (Table 5).

Because of the statistically significant differences in age between women with and without GD, we again performed a respective ANCOVA, which also confirmed for the women sample that age did not confound the dissatisfaction results (Table 6).

Explanatory factor analysis of BIQ-F

According to the analysis, the KMO measure was 0.751 ($P<0.001$), which indicates acceptable construct validity of the scale. Almost all items have extraction factors above 0.5 to assign them to a domain (Table 11). Four different domains could explain more than 77 percent of the variance in the whole scale. (Table 12). According to the Rotated Component Matrix correlations, in the first domain (General body features and Female Primary and Secondary Sexual Characteristics): B-1: the overall appearance of your body, B-2: the age you look, B-5: your height, B-11: your voice, B-34: your breast development, B-37: appearance of your genitals overall, B-38: outer lips (labia majora), B-40: inner lips (labia minora), B-44: vaginal opening and B-46: appearance of your clitoris; in the second domain (Body Composition, Muscularity and Hair Characteristics): items B-8: your weight, B-23: your pubic hair, B-29: your hair on your head and B-31: your muscular development; in the third domain (Facial and Upper Limb Features): items B-14: your forehead, B-15: your ears, B-16: your jaw and B-17: your hands, and in the fourth domain (Body and Facial Hair Characteristics): items B-20: your body hair (on chest, back, arms, legs) and B-26: your facial hair (on chin, upper lip) have been selected (Table 13 and 14).

Table 1. Effects of individual dissatisfaction items on the reliability statistics of the Dissatisfaction Scale of the BIQ-M"

Item	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Cronbach's Alpha If Item Deleted
B-1: the overall appearance of your body	42.68	227.159	0.922
B-2: the age you look	43.74	254.131	0.931
B-5: your height	43.55	246.523	0.929
B-8: your weight	42.71	248.146	0.932
B-11: your voice	42.97	235.832	0.925
B-14: your forehead	43.26	238.331	0.927
B-15: your ears	43.90	251.957	0.931
B-16: your Jaw	43.42	239.718	0.927
B-17: your hands	43.39	237.578	0.926
B-20: your body hair (on chest, back, arms, legs)	42.61	229.645	0.926
B-23: your pubic hair	42.19	240.761	0.928
B-26: your facial hair (on chin, upper lip)	42.42	231.452	0.927
B-29: your hair on your head	43.06	249.529	0.933
B-31: your muscular development	43.06	248.662	0.931
B-34: your chest development	42.68	238.892	0.928
B-36: appearance of your genitals overall	42.55	222.456	0.924
B-43 appearance of your scrotum	42.81	224.895	0.922
B-46 testes	42.77	220.114	0.921

Table 2. Effects of individual dissatisfaction items on the reliability statistics of the Dissatisfaction Scale of the BIQ-F

Item	Scale mean if item deleted	Scale variance if item deleted	Cronbach's alpha if item deleted
B-1: the overall appearance of your body	52.41	315.862	0.942
B-2: the age you look	53.31	327.706	0.945
B-5: your height	52.78	325.144	0.944
B-8: your weight	52.91	337.443	0.946
B-11: your voice	52.91	322.023	0.944
B-14: your forehead	53.94	348.964	0.948
B-15: your ears	54.16	353.555	0.949
B-16: your jaw	54.00	342.065	0.946
B-17: your hands	53.31	326.028	0.945
B-20: your body hair (on chest, back, arms, legs)	53.44	346.577	0.949
B-23: your pubic hair	53.00	344.903	0.949
B-26: your facial hair (on chin, upper lip)	52.84	323.943	0.945
B-29: your hair on your head	53.81	361.899	0.954
B-31: your muscular development	52.94	337.544	0.947
B-34: your breast development	52.38	315.403	0.942
B-37: appearance of your genitals overall	52.31	311.899	0.942
B-38: outer lips (labia majora)	52.31	314.544	0.942
B-40: inner lips (labia minora)	52.47	312.515	0.942
B-44: vaginal opening	52.72	315.499	0.943
B-46: appearance of your clitoris	52.50	311.032	0.941

Table 3. Comparison of individual dissatisfaction items and Sum Score of the Dissatisfaction Scale of the BIQ-M between the gender-dysphoric male sex assigned at birth and cisgender men

BIQ-M Items	Gender-dysphoric clients	Cisgender	Total	P
B-1: the overall appearance of your body	3.8(1.3)	2(0.7)	2.8(1.4)	<0.001
B-2: the age you look	2(1.1)	1.8(0.8)	1.8(0.8)	0.319
B-5: your height	2.2(1.1)	1.7(0.7)	2(1.1)	0.056
B-8: your weight	2.8(1.2)	2.5(1.4)	2.8(1.2)	0.484
B-11: your voice	3.1(1.3)	1.9(0.9)	2.5(1.3)	0.002
B-14: your forehead	2.6(1.4)	1.5(0.5)	2.3(1.3)	0.002
B-15: your ears	2(1.1)	1.4(0.6)	1.6(1)	0.052
B-16: your Jaw	2.3(1.4)	1.6(0.9)	2.1(1.2)	0.061
B-17: your hands	2.8(1.5)	1.5(1)	2.1(1.2)	0.005
B-20: your body hair (on chest, back, arms, legs)	3.7(1.6)	1.8(0.8)	2.9(1.6)	<0.001
B-23: your pubic hair	3.7(1.1)	2.4(1.1)	3.3(1.3)	0.001
B-26: your facial hair (on chin, upper lip)	3.9(1.5)	2.1(0.8)	3.1(1.6)	<0.001
B-29: your hair on your head	2.8(1.3)	2.3(1.4)	2.5(1.3)	0.212
B-31: your muscular development	2.7(1.1)	2(0.9)	2.5(1.1)	0.036
B-34: your chest development	3.5(1.3)	2.3(1.2)	2.8(1.4)	0.003
B-36: appearance of your genitals overall	4.6(1.1)	1.7(0.9)	3(1.8)	<0.001
B-43 appearance of your scrotum	3.9(1.1)	1.5(0.6)	2.7(1.6)	<0.001
B-46 testes	4.3(1.2)	1.4(0.5)	2.7(1.7)	<0.001
Sum	58.4(13)	32(6.2)		<0.001

Cronbach's Alpha (CI95%) 0.931(0.89-0.962)

Table 4. Analysis of Covariances of the Dissatisfaction Scale of the BIQ-M sum score between Cisgender and the control group to control for the age effect

ANCOVA Summary Table		
Source	Sig.	Partial Eta Squared
Corrected Model	<0.001	68.01%
Intercept	<0.001	59.63%
Age	0.812	0.28%
Cisgender vs Control	<0.001	64.84%

Table 5. Comparison of individual dissatisfaction items and Sum Score of the Dissatisfaction Scale of the BIQ-F between the gender-dysphoric female sex assigned at birth and cisgender female

BIQ-F Items	Gender-dysphoric clients	Cisgender	Total	P
B-1: the overall appearance of your body	4.6(0.7)	2.3(1)	3.4(1.5)	<0.001
B-2: the age you look	3.5(1.1)	1.7(1.1)	2.5(1.3)	<0.001
B-5: your height	4(1)	2.3(1.1)	3(1.4)	<0.001
B-8: your weight	3.3(0.9)	2.4(1.2)	2.9(1.1)	0.007
B-11: your voice	3.9(1.3)	1.8(0.9)	2.9(1.5)	<0.001
B-14: your forehead	1.9(0.9)	1.6(0.7)	1.9(0.8)	0.137
B-15: your ears	1.8(0.8)	1.4(0.6)	1.7(0.7)	0.051
B-16: your jaw	2.3(1.2)	1.4(0.6)	1.8(0.9)	0.004
B-17: your hands	3(1.4)	1.7(1)	2.5(1.4)	0.001
B-20: your body hair (on chest, back, arms, legs)	2.6(1.3)	2.3(1.1)	2.4(1.2)	0.373
B-23: your pubic hair	3(1.2)	2.6(1.2)	2.8(1.2)	0.217
B-26: your facial hair (on chin, upper lip)	3.7(1.5)	2(0.8)	3(1.5)	<0.001
B-29: your hair on your head	1.8(1)	2.2(1.2)	2(1.1)	0.252
B-31: your muscular development	3.4(1.5)	2.3(1)	2.9(1.2)	0.012
B-34: your breast development	4.7(0.8)	2(1.1)	3.4(1.5)	<0.001
B-37: appearance of your genitals overall	5(0)	2(1)	3.5(1.6)	<0.001
B-38: outer lips (labia majora)	4.9(0.5)	2.1(1)	3.5(1.5)	<0.001
B-40: inner lips (labia minora)	4.9(0.5)	2(1)	3.3(1.7)	<0.001
B-44: vaginal opening	4.6(0.7)	1.7(0.7)	3.1(1.6)	<0.001
B-46: appearance of your clitoris	4.8(0.5)	2(0.9)	3.3(1.6)	<0.001
Sum	72.3(8.7)	41.3(12.7)	55.8(19.1)	<0.001
Cronbach's Alpha	0.948(0.918-0.971)			

Table 6. Analysis of Covariances of the Dissatisfaction Scale of the BIQ-F sum score between Cisgender and the control group to control for the age effect

ANCOVA Summary Table		
Source	Sig.	Partial Eta Squared
Corrected Model	<0.001	69.9%
Intercept	<0.001	46.3%
Age	0.100	9.7%
Cisgender vs Control	<0.001	68.4%

Table 7. Items extraction factors for Dissatisfaction Scale of the BIQ-M

Items	Extraction
B-1: the overall appearance of your body	.865
B-2: the age you look	.869
B-5: your height	.470
B-8: your weight	.816
B-11: your voice	.778
B-14: your forehead	.613
B-15: your ears	.740
B-16: your Jaw	.701
B-17: your hands	.645
B-20: your body hair (on chest, back, arms, legs)	.664
B-23: your pubic hair	.618
B-26: your facial hair (on chin, upper lip)	.525
B-29: your hair on your head	.802
B-31: your muscular development	.796
B-34: your chest development	.456
B-36: appearance of your genitals overall	.871
B-43 appearance of your scrotum	.883
B-46 testes	.943

Table 8. Eigen values for domains extracted for Dissatisfaction Scale of the BIQ-M

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	8.481	47.115	47.115
2	1.899	10.548	57.663
3	1.455	8.085	65.747
4	1.221	6.785	72.532

Table 9. Rotated component matrix item correlation with domains in Dissatisfaction Scale of the BIQ-M

Items	Domains			
	1	2	3	4
B-1	0.818			
B-2				0.703
B-5		0.574		
B-8			0.817	
B-11		0.689		
B-14		0.627		
B-15		0.824		
B-16		0.76		
B-17		0.429		
B-20	0.703			
B-23	0.738			
B-26	0.566			
B-29				0.809
B-31			0.783	
B-34	0.516			
B-36	0.876			
B-43	0.869			
B-46	0.818			

Table 10. Domains and Items of Body Image Questionnaire in Men

Questionnaire	Domain	Items BIQ-M	Title
1		the overall appearance of your body, your body hair (on chest, back, arms, legs), your pubic hair, your facial hair (on chin, upper lip), your chest development, appearance of your genitals overall, appearance of your scrotum and testes	Male Primary and Secondary Sexual Characteristics
2		your height, your voice, your forehead, your ears, your Jaw, and your hands	General Body and Facial Features
3		your weight and your muscular development	Body Composition and Muscularity
4		the age you look and your hair on your head	Perceived Age and Hair Appearance

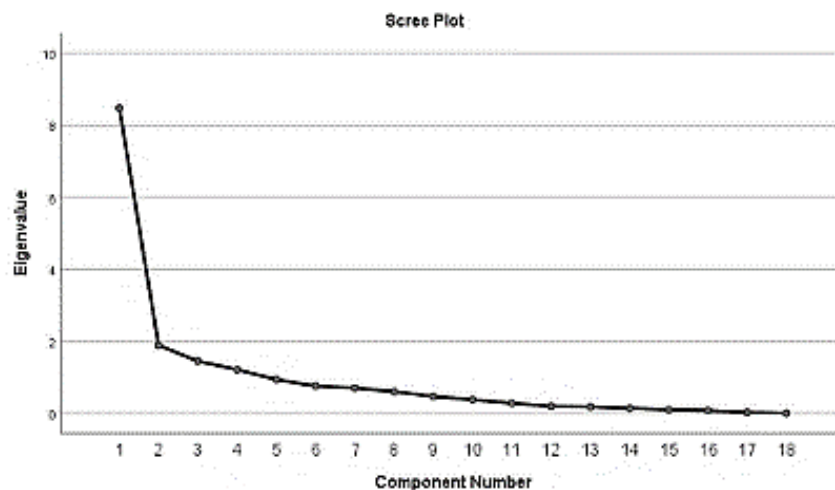
**Figure 1. Loading factor for each component in BIQ-M Questionnaire**

Table 11. Items extraction factors for Dissatisfaction Scale of the BIQ-F

Items	Extraction
B-1: the overall appearance of your body	.899
B-2: the age you look	.634
B-5: your height	.826
B-8: your weight	.717
B-11: your voice	.685
B-14: your forehead	.715
B-15: your ears	.811
B-16: your jaw	.709
B-17: your hands	.709
B-20: your body hair (on chest, back, arms, legs)	.800
B-23: your pubic hair	.448
B-26: your facial hair (on chin, upper lip)	.897
B-29: your hair on your head	.640
B-31: your muscular development	.626
B-34: your breast development	.775
B-37: appearance of your genitals overall	.940
B-38: outer lips (labia majora)	.932
B-40: inner lips (labia minora)	.921
B-44: vaginal opening	.905
B-46: appearance of your clitoris	.902

Table 12. Eigen values for domains extracted for Dissatisfaction Scale of the BIQ-F

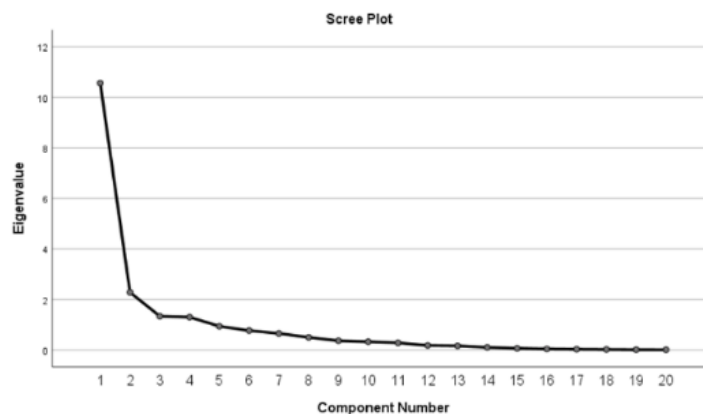
Component	Initial eigenvalues		
	Total	% of Variance	Cumulative %
1	10.565	52.827	52.827
2	2.284	11.419	64.246
3	1.339	6.695	70.941
4	1.304	6.520	77.461

Table 13. Rotated Component Matrix item correlation with domains in Dissatisfaction Scale of the BIQ-F

Items	Domains			
	1	2	3	4
B-1	0.906			
B-2	0.527			
B-5	0.795			
B-8		0.693		
B-11	0.572			
B-14			0.726	
B-15			0.853	
B-16			0.539	
B-17			0.487	
B-20				0.864
B-23		0.524		
B-26				0.741
B-29		0.752		
B-31		0.639		
B-34	0.786			
B-37	0.942			
B-38	0.928			
B-40	0.933			
B-44	0.915			
B-46	0.884			

Table 14. Domains and items of body image questionnaire in females

Questionnaire	Domain	Items BIQ-F	Title
1		the overall appearance of your body, the age you look, your height, your voice, your breast development, appearance of your genitals overall, outer lips (labia majora), inner lips (labia minora), vaginal opening, and the appearance of your clitoris	General body features and Female Primary and Secondary Sexual Characteristics
2		your weight, your pubic hair, your hair on your head, and your muscular development	Body Composition, Muscularity, and Hair Characteristics
3		your forehead, your ears, your jaw, and your hands	Facial and Upper Limb Features
4		your body hair (on chest, back, arms, legs) and your facial hair (on chin, upper lip)	Body and Facial Hair Characteristics

**Figure 2.** Loading factor for each component in BIQ-F questionnaire

Discussion

In this study, we translated and adapted into the Persian language both gender versions of the English-language Body Image Questionnaire (BIQ). The analysis of its face and content validity established its appropriateness for the Persian population. A psychometric study with male and female individuals with gender dysphoria and non-dysphoric controls- both groups recruited from multiple hospitals- demonstrated high internal consistency as well as excellent discriminant validity of the resulting total Dissatisfaction scales. Our findings on internal consistency and discriminant validity of the BIQ parallel those found for other body-image measures used in international studies (6,13,15,16).

In this study, Cronbach's alpha of the Dissatisfaction Scale of the BIQ-M was 0.931 & Cronbach's alpha of the Dissatisfaction Scale of the BIQ-F was 0.948. The value of BIQ-F is somewhat higher than that of the Dissatisfaction Scale of the BIQ-M, but according to the 95% confidence intervals, there is no statistically significant difference between them. These alpha values are much higher than those found for the Iranian BIS scale: 0.60 for birth-assigned males (transgender women) and 0.73 for birth-assigned females (transgender men) (9).

In comparison with other similar questionnaires, the BIQ includes more questions about the genital area, which is the main concern of body image, in clients with gender dysphoria. Some researchers found that gender dysphoria treatment can increase body satisfaction, and this increase in body satisfaction is thought to be the result of gender-affirming surgeries that make the sex-specific body parts more congruent with the patient's gender identity (4). So, the BIQ may be more useful in this regard. However, researchers should also explore bodily (dis)satisfaction about body parts that cannot be modified through medical intervention (i.e., hands or feet). This, in turn, would enable a better understanding of body image in transpeople, which would inform clinical practice (4). The BIQ includes pertinent questions for this area, too.

Consistent with some previous findings on body dissatisfaction (3,7,10), GD clients in both groups (MtF & FtM) reported higher levels of dissatisfaction compared to their cisgender controls.

The EFA resulted in 4 different subdomains of the questionnaire items. In both groups, some items related to primary and secondary sexual characteristics indicated prominent dissatisfaction. This finding is consistent with prior studies that reported the highest degree of dissatisfaction with primary and secondary sex characteristics in clients with gender dysphoria (3,5,17). In both groups, certain features related to central gender

markers were considered particularly important. Also, the overall appearance of the body was categorized as the first domain of dissatisfaction among transmen and transwomen, likely because it is highly visible in social interactions and plays a significant role in sociocultural expectations shaping body image experiences. Besides, there is evidence that body satisfaction improves with increased social acceptance in transgender persons (17).

In addition, height was placed in the first domain among FtM clients, indicating that it was associated with the highest level of dissatisfaction compared to cisgender individuals. Although this item was associated with a relatively lower level of dissatisfaction in MtF groups compared to cisgender men, its placement in the second domain still highlights the importance of this item for all clients. The greater dissatisfaction reported by FtM clients regarding this characteristic may indicate its importance in the male gender role within Iranian culture. Although limited scientific research has directly addressed the role of height in body image among Iranian men, it appears that in Iranian society, height is linked to traditional masculine ideals. Also, in our study, muscularity was placed in the second domain among FtM clients and in the third domain in MtF clients, indicating the greater importance of this item for transmen (FtM clients) compared to transwomen (MtF clients). Hair, on the other hand, was placed in the first domain among MtF clients. These findings are relatively consistent with Van de Grift's research (2016), which showed that in transwomen, body concerns were mostly related to their voice and hair, while, in transmen, they were related to their muscularity and posture (10). However, in our study, voice appeared to be more important for FtM clients than for MtF clients, which may reflect the influence of cultural factors. In some cases, having a feminine voice can lead to humiliation, which might explain this difference.

Our study has some limitations. The small sample size may limit the generalizability of our findings to the wider gender dysphoria population; however, it should be noted that why recruitment is challenging. It also does not allow us to evaluate the effects of variations in age. Future studies of the Persian-language version of the BIQ should include the assessment of CFA, construct validity, responsiveness, and retest reliability of individual items as well as of the derived scales. Using larger samples would also permit the application of factor analysis for the further exploration of the questionnaire's structure. Yet, even with the currently available information, our study makes a significant contribution to gender dysphoria research within the Persian cultural context.

Our study effectively validates the Persian version of the Body Image Questionnaire (BIQ) by showing that this questionnaire could excellently differentiate the body image of transgender people from that of cisgender controls within Iran's sociocultural context. Its validity and reliability make it a valuable tool for clinical use, aiding in evaluating body dissatisfaction in gender dysphoria. It should be noted that the constructs of this questionnaire will be useful for future studies of GD samples in Iran.

Ethics approval was obtained from the Institutional Review Board of Tehran University of Medical Sciences (IR.TUMS.MED.REC.1397.690). Informed consent was obtained from all participants included in the study.

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Ethics approval was obtained from the Institutional Review Board of Tehran University of Medical Sciences (IR.TUMS.MED.REC.1397.690) approving the study protocol.

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