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Psychometric assessment of the persian version of a dimensional instrument to measure gender identity disorder

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Artículos

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Evaluación psicométrica de la versión persa de un instrumento dimensional para medir el trastorno de identidad de género

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Abstract:

Introduction & Aim: Regarding dimensional approach to the gender dysphoria, the aim of the present study was to evaluate validity and reliability of the Dimensional Measure of Gender Identity Disorder Questionnaire in Persian.
Methods: Participants included 62 patients with gender dysphoria (46 female-to-male patients, and 16 male-to-female cases) and 150 people as the control group (83 women and 67 men) along with parents or close relatives of 34 patients. The questionnaires given to participants included Persian version of the Dimensional Measure of Gender Identity, together with the Bem Sex Role Inventory, and Gender-Masculine and Gender-Feminine scales derived from Minnesota Multiphasic Personality Inventory-2 (MMPI-2).
Results: The adolescents' form of the Dimensional Measure of Gender Identity Disorder Questionnaire showed a poor correlation with gender roles. Cronbach's alpha was 0.992 for men and 0.989 for women. Factor analysis showed one-factor solution in both groups and explained 92.6% of the total variance in men and 92.3% in women. The correlation between adolescents (reported by the person) and childhood (reported by parents) forms of the questionnaire was 0.59 in men and 0.61 in women.
Conclusion: The Persian version of the Dimensional Measure of Gender Identity Disorder Questionnaire showed satisfactory internal consistency and diagnostic value, with a single factor structure in both men and women. This questionnaire measures gender identity irrespective of gender roles. However, psychometric features of the questionnaire should be assessed in other clinical groups.

Keywords: Gender Identity Disorder, Gender Dysphoria, Validity, Reliability, Gender Identity.

Resumen:

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Introducción y objetivo: Con respecto al enfoque dimensional de la disforia de género, el objetivo del presente estudio fue evaluar la validez y confiabilidad del Cuestionario de la Medida Dimensional del Trastorno de Identidad de Género en persa.
Métodos: Los participantes incluyeron 62 pacientes con disforia de género (46 pacientes de sexo femenino y 16 casos de hombre a mujer) y 150 personas como grupo de control (83 mujeres y 67 hombres) junto con los padres o familiares cercanos de 34 pacientes. . Los cuestionarios entregados a los participantes incluían la versión persa de la Medida dimensional de la identidad de género, junto con el Inventario de roles sexuales de Bem, y las escalas de género masculino y género femenino derivadas del Inventario de personalidad multifásico de Minnesota-2 (MMPI-2).
Resultados: La forma de los adolescentes del Cuestionario de Medición Dimensional del Trastorno de Identidad de Género mostró una correlación pobre con los roles de género. El alfa de Cronbach fue de 0.992 para los hombres y 0.989 para las mujeres. El análisis factorial mostró una solución de factor único en ambos grupos y explicó el 92,6% de la varianza total en hombres y el 92,3% en mujeres. La correlación entre los adolescentes (informada por la persona) y la infancia (informada por los padres) de las formas del cuestionario fue de 0,59 en los hombres y 0,61 en las mujeres.
Conclusión: La versión persa del Cuestionario de la Medida Dimensional del Trastorno de Identidad de Género mostró una consistencia interna y un valor diagnóstico satisfactorios, con una estructura factorial única tanto en hombres como en mujeres. Este cuestionario mide la identidad de género independientemente de los roles de género. Sin embargo, las características psicométricas del cuestionario deben evaluarse en otros grupos clínicos.
Palabras clave: Trastorno de identidad de género, disforia de género, validez, confiabilidad, identidad de género.

Introduction

Gender identity refers to a person's feeling as a man or woman. Generally, a person's perception of his/her gender (gender identity) is consistent with chromosomal structure and external genitalia system. However, gender identity and anatomical sexuality do not correspond in some people. According to the fifth edition of Diagnostic and Statistical Manual of Psychological Disorders (DSM-5), an obvious disagreement between gender identity and biological gender along with dysphoria leads to a diagnosis of gender dysphoria (previously known as Gender Identity Disorder or GID) [2,3]. Gender identity disorder can be regarded as a serious form of gender dysphoria [4].

Traditionally, gender identity is known as a two-fold variable (man/woman). However, social conducts that openly defy traditional boundaries defined for men and women are more prevalent today [5] and this makes the above dichotomy doubtful, and some people can be imagined in between the perfectly masculine and perfectly feminine poles. Moreover, the number of transgender people is likely to be greater than the number of people with gender identity disorder [6]. However, many of these people may not be willing to have Sex Reassignment Surgery (SRS). These people may be suffering from subthreshold of gender identity disorder. Accordingly, compared to traditional terms such as "transsexuality" and "gender identity disorder", the term "gender dysphoria" has a dimensional treatment of a person's dissatisfaction, distress, discomfort, and anxiety in facing his biological gender such that normal people with no gender dysphoria are at one end of the spectrum and transsexual people at the other end [7,8].

A group of homosexual women (lesbian) with both masculine and feminine physical features (tranny boys) have been known to have no desire for full treatment and sex change, but wish to have mastectomy or hormone therapy [9,10]. The feeling of anatomical dysphoria has been reported in female-to-male transsexuals (FMTS) and butch lesbians [11]. In addition, changes in a person's perception of gender identity may be associated with inter-sexual modes and sexual development disorders such as Congenital Adrenal Hypertrophy (CAH), Closalextrophy, and 5-alpha-reductase 2, and 17-beta hydroxyl-steroid dehydrogenase-3 [15-17]. It should be noted that the gender-incongruent people do not necessarily have a cross-gender identity and do not always require medical care [5,11 ,18]. Not all people that are not in male/female dichotomy suffer distress [19].

However, not many studies have conducted a dimensional assessment of gender identity disorder/gender dysphoria. Traditionally, the cognitive component of perception of gender identity has precedence over its

effective component; as such, since the 70's, gender identity has been determined according to the person's cognitive understanding of themselves as a member of a biologically same-sex group and their role in this group [20] . Zucker et al. (1993) pointed out the importance of a cognitive component of gender identity perception, considered its affective components, and quantitatively measured gender identity. According to factor analysis, two different factors had a role in deciding gender identity (cognitive gender confusion and affective gender confusion) [13] . In 1992, Fleming & Docter first designed a questionnaire for assessment of gender identity in transsexual and transvestite men, and extracted four factors including cross-gender identity, cross-gender feminization, cross-gender social/sexual role, and cross-gender sexual arousal[21] . Then, they developed a similar questionnaire with five factors in 2001 (Identity, Role, Sexual Arousal, Androallure, and Pleasure) [22] . This questionnaire was not applicable to biological females and was not used in non-clinical groups. On the one hand, dimensional assessment of gender dysphoria sometimes had a single factor structure, with examples such as: Cohen-Kettenis and Van Goozen set of questions for both male and female transsexual groups, and Deogracias et al. Gender Identity/Gender Dysphoria Questionnaire for Adolescents and Adults (GIDYQ-AA) based on subjective, physical (somatic), social, and social-legal components of gender identity [23,24] . On the other hand, with contents of questionnaires approaching clinical diagnosis, Fisher et al. developed Dimensional Measure of Gender Identity in Biological males questionnaire based on childhood Sexual Preferences, Fatherhood, Gender Dysphoria, Childhood games and playmates, and doubt about SRS [4] . However, gender dysphoria is a key indicator in the diagnosis of GID, initial sexual preferences and GID-related conducts in childhood (including games and playmates) form heterogeneous subgroups of disorder [25] . Factor analysis revealed two factors; one included childhood sexual preferences, fatherhood experience, and gender dysphoria, and was named "Sexual Orientation", and the other included either gender dysphoria with childhood games and playmates or doubt about SRS, which determined gender identity. One of the gender dysphoria questions was common between these two factors. It is possible that like some psychological disorders in DSM-5 (such as episodes of major depression or mania and substance use disorder), the severity of the disorder can be determined according to the number of criteria applicable to a person. However, this method has been widely used. It may be possible to determine the severity of each criterion in a person and regard the severity of disorder as the sum of scores given to every single criterion. A dimensional measure of gender identity disorder questionnaires has been developed by the International Foundation of Gender Education for quantitative assessment of gender dysphoria based on DSM-5 clinical criteria. However, not many studies have been conducted to assess its psychometric properties. The present study was conducted with the aim to translate these questionnaires into Persian and determine their validity and reliability in a Persian-speaking population.

Materials and methods

The present cross-sectional study was conducted on three groups of people. First: 62 patients with gender dysphoria presenting to Tehran Psychiatric Institute from summer 2015 to summer 2016, including 46 female-to-male patients (FMTS) and 16 male-to-female patients (MFTS) with a mean age (± standard deviation) of 32.4±9.5 years and 34.8±11.5 years, respectively. Second; 34 parents or close relatives including 25 mothers (6 in MFTS group and 19 in FMTS), 6 fathers (all in FMTS group), and 3 other close relatives (1 in MFTS group and 2 in FMTS). Third: 150 people in the control group including 83 women and 67 men, with a mean age (± standard deviation) of 24.1±7.5 years and 25.1±6.1 years, respectively.

The inclusion criteria in the gender dysphoria group were confirmed diagnosis of gender dysphoria based on DSM-5 criteria by an experienced psychiatrist with faculty membership and based on clinical interview, age between 15 years and 65 years, minimum education of eight years, with no mental retardation, major and acute mood episodes (episodes of major depression and mania), and acute or chronic psychotic disorders

based on the psychiatrist's diagnosis. The inclusion criteria in the second group (parents) included having proper information about childhood and adolescence of patient with gender dysphoria and the above psychiatric disorders. The inclusion criteria for the third group were similar to those of the patients' group, but these participants had no complaint about their sexual identity. This group was selected from people visiting Tehran Psychiatric Institute and Tehran Psychiatric Hospital through convenience sampling. After knowing the research objectives, all participants gave their informed written consent for taking part in the study.

To assess gender identity, the Dimensional Measure of Gender Identity Disorder Questionnaire in adult and children versions were used, which are freely available from the following addresses:

http://www.ifge.org/302.6_Gender_Identity_Disorder_in_Children

http://www.ifge.org/302.85_Gender_Identity_Disorder_in_Adolescents_or_Adults

These questionnaires were first translated by one researcher (E.Sh) and then edited by another (K.A). The edited Persian translations were translated back into English by an expert in both Persian and English languages and were compared to the original versions so as to correct possible ambiguities or problems in the first translations. After editing and preparation of the Persian version, the questionnaires were given to 8 faculty members of the universities of medical sciences including 7 psychiatrists and one clinical psychologist to confirm the relevance and necessity of the items. The content validity index (CVI) was found for each question and the entire questionnaire [26], which was higher than 0.7 in every case. In cases with CVI<1, the favorable view of the experts was obtained by editing the question concerned, except in the case of the last question that was about age at onset of the disorder, which was found 0.25. However, this question was not discarded since it is not incorporated in the final scoring. The final translations were given to 10 people with previous diagnosis of gender identity disorder to assess fluency and understandability of the items, and with their confirmation, the final Persian version of the questionnaires was ready. Modifications made in the questionnaires according to views expressed by experts included changing "Severe" to "Much" and "Very severe" to "Very much" options in all questions. In question 3 of the male and female children's questionnaire, "Imaginary games" was changed to "Imaginative childish games", and in question 5, "Opposite-sex playmates" was changed to "Girl playmate" and "Boy playmate". Questions were regularly numbered such that 9 questions were numbered instead of 8 and questions 6A and 6B in the male children questionnaire and instead of 8 and questions 2A and 2B in the female one. In the adolescents' and adults' version, male and female questionnaires were separated. Option "Severe" was changed to "Much" and "Very severe" to "Very much" in all questions. Incomplete sentences were rewritten as questions. In questions 4 to 6 and 8 in the second part, other sex was changed to girl/woman and boy/man depending on the case, and in question 4 part one, "Dissimilar" was changed to "Incongruent".

To obtain data, in addition to the background information form (including age, gender at birth, rearing gender, and education) and the Dimensional Measure of Gender Identity Questionnaire, two other questionnaires were given to gender dysphoria and control groups to complete when they visit the center, which included Gender-Masculine (GM) and Gender-Feminine (GF) scales derived from MMPI-2 [27] and Bem Sex Role Inventory (BSRI) [28]. The Persian version of GM and GF scales derived from MMPI-2, which had been adapted for the Iranian population was used [29]. This 53-item scale is highly correlated with the English version, with a Cronbach's alpha coefficient of 0.83 in men and 0.89 in women [30]. Bem Sex Role Inventory (BSRI) is, in fact, a 60-item scale [28], which was used in the present study based on the study of Alavi et al. in which Iranian men and women were found to be significantly different in 26 items of BSRI. The Cronbach's alpha coefficient in items relating to masculine and feminine gender roles in an Iranian sample was 0.72 and 0.56, respectively [29,30]. Parents of participants with the diagnosis of gender dysphoria were asked to complete the childhood form of the Dimensional Measure of Gender Identity Questionnaire.

Data were analyzed in SPSS 22 using independent and paired t-tests and also Pearson's Correlation Coefficient to find the correlation between data. Reliability was assessed according to the Cronbach's alpha coefficient. Statistical analysis was carried out using exploratory factor analysis according to the principal components method and no rotation was used since only one factor was obtained in both groups. Moreover, in factor analysis, items were selected or deleted according to factor loading higher than 0.5. Diagnostic value of the diagnostic test was determined according to the sensitivity and specificity indices and the optimum cut-off point was considered at the score that provided the highest combined sensitivity and specificity. Where necessary, $p<0.05$ was considered significant for statistical test results.

Results:

Gender Roles

Scores of masculine and feminine roles based on GM and GF scales are presented in (**Table 1**).

TABLE 1:
Scores of Gender-Masculine (GM) and Gender-Feminine (GF) roles derived from MMPI-2 and Bem Sex Role Inventory (BSRI)

Table 1: Scores of Gender-Masculine (GM) and Gender-Feminine (GF) roles derived from MMPI-2 and Bem Sex Role Inventory (BSRI)

Group	Mean (± SD)	Median	Minimum - Maximum	T-test to compare two groups
*GM Scale				
Male-to-female patients (MFTS)	13.4±5.2	13.5	5-21	t=12.194; p<0.001
Female-to-male patients (FMTS)	27.3±1.8	28	19-34	
*GF Scale				
Male-to-female patients (MFTS)	30.3±6.5	30	26-36	t=12.030 p<0.001
Female-to-male patients (FMTS)	15.4±5.5	16	7-26	
*BSRI; Masculine roles				
Male-to-female patients (MFTS)	44.9±1.1	43	26-59	t=4.768 p<0.001
Female-to-male patients (FMTS)	57.10±7.1	57	35-79	
*BSRI; Masculine roles				
Male-to-female patients (MFTS)	73.7±9.8	72	58-83	t=3.829 p<0.001
Female-to-male patients (FMTS)	63.9±6.7	63.5	44-83	

Scores in the Dimensional Measure of Gender Identity Disorder Questionnaire

(**Table 2**) presents scores obtained in the Dimensional Measure of Gender Identity Questionnaire. When scores of questions 1 to 6 from part 2 were considered alone in adolescents and adults, MFTS patients had significantly higher scores compared to men in the control group ($t=27.752$; $p<0.001$;) and FMTS patients had significantly higher scores compared to women in the control group ($t=35.687$; $p<0.001$). Similar results are obtained when scores of items 2 to 4 from part one of the questionnaire are added to the above score

such that in the biological male group, MFTS patients scored significantly higher than men in the control group (t=26.470; p<0.001), and in biological female group, FMTS patients scored significantly higher than women in the control group (t=49.024; p<0.001). Scores obtained in the above two methods are strongly correlated such that Pearson's correlation coefficient in these scoring methods was 0.997 in the biological male group and 0.996 in the biological female group (p<0.001 in both cases).

Based on the clinical diagnosis and the first scoring method (6 questions from part 2), a score of 23 in gender identity disorder scale differentiated gender dysphoric patients from healthy people in biological females with a sensitivity of 100% and specificity of 98.8%. Also, a score of 18 was able to differentiate GID patients from people in the control group in the biological male group, with a sensitivity of 100% and specificity of 98.5%. The area under ROC curve was 0.999 (SE=0.002; p<0.001) in the male group and 1.000 (SE=0.000; p<0.001) in the female group. In the second scoring method (items 2 to 4 from part 1 plus the first 6 items from part 2), the best cut-off point was at score of 26 in biological male group, with sensitivity of 100% and specificity of 98.5%, and at score of 35 in biological female group, with sensitivity of 100% and specificity of 100%. In this method, the area under ROC curve was 0.999 (SE=0.002; p<0.001) in the male group and 1.000 (SE=0.000; p<0.001) in the female group.

TABLE 2:
Gender identity disorder scores based on DSM-5 in participants

Table 2: Gender identity disorder scores based on DSM-5 in participants

Group	Mean (± SD)	Median	Minimum - Maximum
*Childhood score			
Male-to-female patients (MFTS)	30.15±4.4	37	11-45
Female-to-male patients (FMTS)	37.6±8.8	40	22-45
*Scores of adolescents and adults: Items 1 to 6 of part 2			
Male-to-female patients (MFTS)	28.2±4.9	30	19-30
Female-to-male patients (FMTS)	29.1±4.0	30	26-30
Control group men	7.4±9.0	6	6-26
Control group women	7.2±1.7	6	6-21
*Scores of adolescents and adults: Items 2 to 4 of part 1 and 1 to 6 of part 2			
Male-to-female patients (MFTS)	41.4±7.6	42.5	27-45
Female-to-male patients (FMTS)	43.2±4.3	45	37-45
Control group men	10.4±8.1	9	9-31
Control group women	11.5±8.0	10	9-33

Correlation between childhood and adolescent scores

Patients' relatives also took part in the study in 7 cases from MFTS and 27 cases from FMTS patients. In the MFTS group, the correlation coefficient between patient-completed and parent-completed (about childhood) questionnaires in the first scoring method was 0.638 (P=0.123). This coefficient was 0.708 in FMTS group (P<0.001). In the second scoring method, this coefficient was 0.659 (P=0.108) in MFTS and 0.613 (P=0.001) in FMTS groups.

Correlation between Gender Identity Disorder and Sex Roles scores

Based on (**Table 3**), masculine and feminine roles can be said to have no significant correlation with scores in the Dimensional Measure of Gender Identity Questionnaire. No significant correlation was observed between the Dimensional Measure of Gender Identity Disorder Questionnaire score and sex roles, and this coefficient never reached ±0.4.

TABLE 3:
Pearson's correlation coefficient between scores of gender identity disorder and sex roles, with p>0.05 in every case

Table 3: Pearson's correlation coefficient between scores of gender identity disorder and sex roles, with p>0.05 in every case

	MMPI-2		Bem Sex Role Inventory (BSRI)	
	Gender Masculine (GM)	Gender Feminine (GF)	Masculine	Feminine
*Scores of items 1 to 6 of part 2				
Male-to-female patients (MFTS)	0.258	-0.135	0.189	0.144
Female-to-male patients (FMTS)	0.152	-0.256	-0.138	-0.100
*Scores of items 2 to 4 of part 1 and 1 to 6 of part 2				
Male-to-female patients (MFTS)	0.150	0.012	0.159	0.199
Female-to-male patients (FMTS)	0.213	-0.252	0.110	0.021

Internal consistency

In children's questionnaire, Cronbach's alpha was 0.939 in biological females, which increased to 0.948 after eliminating item 7. This coefficient was 0.982 in the biologically male group, which increased to a maximum of 0.988 after eliminating item 7. With regard to adolescents and adult, taking into account reverse scoring in item 2 from part 1 and elimination of item 1 from part 1 and items 7 and 8 from part 2 (not involved in scoring of severity), the Cronbach's alpha coefficient was 0.989 and 0.992 in biological females and males, respectively, which increased to 0.991 and 0.992, respectively, after eliminating item 2 from part 1.

Factor structure

Factor structure of the questionnaire was assessed using items 2 to 4 and the first 6 items of part 2. Factor analysis, based on the principal component method, led to the extraction of a single factor in both biological males and females, which with Eigenvalue of 8.337 in males and 8.304 in females, and explained 92.6% and 92.3% of the total variance, respectively. Factor loading of these items is presented in (**Table 4**).

TABLE 4:
Factor loading of items of adolescents and adults questionnaire in factor analysis using principal component method

Table 4: Factor loading of items of adolescents and adults questionnaire in factor analysis using principal component method

Item	Factor loading in men	Factor loading in women
2 of part 1 (reverse score)	0.890	0.905
3 of part 1	0.942	0.940
4 of part 1	0.970	0.977
1 of part 2	0.982	0.976
2 of part 2	0.979	0.982
3 of part 2	0.968	0.977
4 of part 2	0.079	0.963
5 of part 2	0.969	0.965
6 of part 2	0.980	0.957

Sexual orientation

In each of the two groups of patients, only one person had a heterosexual orientation (opposing sexual orientation to own biological sex) (6.3% in the MFTS group and 4.3% in FMTS). However, 30% of people had non-heterosexual orientation in each of the control groups.

To assess the relationship between the Dimensional Measure of Gender Identity Disorder Questionnaire scores and sexual orientation, the second scoring method was used in the control group. In addition, first, heterosexual people were assigned to one group and homosexual, bisexual, and asexual people to another under non-heterosexuals, and then, heterosexual and asexual people were placed in one group under non-homosexuals, and homosexuals and bisexuals together in another group called homosexuals. According to (**Table 5**), the Dimensional Measure of Gender Identity Disorder Questionnaire scores in male group were significantly higher in non-heterosexual men compared to heterosexual men (p=0.012). However, no significant difference was found between subgroups in other cases.

TABLE 5:
Scores of the Dimensional Measure of Gender Identity Disorder Questionnaire in sexual orientation subgroups

Table 5: Scores of the Dimensional Measure of Gender Identity Disorder Questionnaire in sexual orientation subgroups

Classification	Biological sex	Subgroups	N	Mean (± SD)	T-test
Heterosexual vs. Non-Heterosexual	Men	Heterosexual	47	9.1±6.6	t=2.779 p=0.012
		Non-Heterosexual	20	13.6±6.3	
	Women	Heterosexual	59	11.5==3.0	t=1.554 p=0.127
		Non-Heterosexual	24	13.4±1.7	
Non-Homosexual vs. Homosexual	Men	Non-Homosexual	54	10.2±1.6	t=1.964 p=0.072
		Homosexual	13	13.7±9.0	
	Women	Non-Homosexual	70	11.4±5.8	t=1.558 p=0.123
		Homosexual	13	13.5±8.5	

Discussion

The present study assessed the psychometric properties of the Dimensional Measure of Gender Identity Questionnaire, which had been designed according to the gender Dysphoria criteria in DSM-5. Although this questionnaire had been designed according to the formal diagnostic criteria for this disorder, no study has been yet conducted to assess its psychometric properties. In the meantime, the DSM-5 diagnostic criteria have become more stringent for children and easier for adults, and place more emphasis on gender dysphoria (that seem to be more dimensional) rather than gender identity that can be overlooked as a categorical variable. Besides, most quantitative questionnaires on this disorder are consistent with the previous criteria of Gender Identity Disorder (GID) [4,13,23-25,31] and some have only been applied to specific clinical groups or biological men [21,22].

In the present study, an effort was made to properly translate this questionnaire into Persian. However, review of the content and face validity of the translated version showed that although the concept of sexuality and sexual roles are dependent on culture [31,32], the disorder criteria have been so designed to enable almost similar assessments in different cultures. This has been previously reported in comparing Dutch and Canadian children with gender identity disorder [33]. The present questionnaire showed favorable alpha coefficients, which exceeded 0.9 in both men and women and both childhood and adolescent versions. This result suggests very high internal consistency of questionnaire items [34,35]. Nevertheless, it should be noted that although internal consistency is an emphatic method for assessment of the reliability of psychology tools, it does not imply long-term stability of results [36].

On the other hand, factor analysis showed a single-factor structured questionnaire in both men's and women's groups and this common factor, namely gender dysphoria, explains more than 90% of the common variance. Homogeneous and single-factor structure in the quantitative assessment of gender identity disorder has also been confirmed by Cohen-Kettenis and Van Goozen [23]. Zucker et al. differentiated cognitive and affective components of gender confusion [13] and Fisher et al. proposed gender identity and sexual orientation as two separate (though overlapping) constituent parts of this variable [4]. In two studies, Fleming & Docter considered gender identity and sex roles as separate and even extracted other factors that rather implied sexual activity in the structure of gender identity disorder [21,22]. The insignificant correlation between scores in the gender identity questionnaire and sex roles that never exceeded ±0.4 in the present study also suggested relative independence of gender identity and sex roles [46-48].

In absence of children samples in the present study, adults or close relatives of patients with gender dysphoria were used to assess the validity of the Dimensional Measure of Gender Identity Disorder Questionnaire in childhood and adulthood. The score in child form of this questionnaire (based on parents' report of their children's childhood) was only moderately correlated with how the person current perceived himself (in both cases: $0.6<r<0.75$), which of course was not statistically significant due to a serious sample size limitation in biological men's group. This moderate correlation can be attributed to the actual gap between parents' knowledge of their children, children's perception of themselves, and real differences created over time as well as the recollection bias. Similarly, in other studies, questionnaires completed by parents only moderately correlated with severity of disorder concurrently assessed by experts, where, of course, the severity of disorder perceived by parents in children with full criteria was higher [33,37]. These results suggest that parents' perception of children's behavior may not exactly match what is experienced by children.

On the other hand, considering the second part of adolescence and adulthood questionnaire, with a sensitivity of 100% and specificity of more than 98%, this questionnaire was able to differentiate people with gender dysphoria from the participants of the control group even though the right cut-off points

were different in men and women. Addition of the first part increased the diagnostic specificity of the questionnaire in the women's group to 100%. However, this result is somewhat influenced by the method of sampling in patients and also the control groups. Given the legal issues and social and cultural sensitivities, diagnosis of gender identity disorder in Iran is very carefully carried out and only totally definitive cases are diagnosed as gender identity disorder/gender dysphoria. As a result, the patients' group was highly homogeneous such that the coefficient of variance (CV) of scores of men and women with gender dysphoria (both parts of the questionnaire) was 0.11 and 0.05 respectively, which is negligible [38]. On the other hand, this result showed greater variation in scores of biological men compared to biological women. It has been said that transsexual women are a homogeneous group that experiences a severe form of gender dysphoria, but transsexual men are a heterogeneous group [4,25]. On the other hand, in the control group of men and women, this figure was 0.38 and 0.42 respectively, which shows that the control group was somewhat more heterogeneous than the patients' group. In the present study, the control group practically consisted of a group of patients with complaints other than gender identity disorder and their non-patient relatives. The difference that was observed in the changeability of scores in men and women patients was far less severe in the control group.

The results of the present study showed the significantly greater severity of gender dysphoria in non-heterosexual men compared to heterosexual men. However, no significant difference was found between heterosexual and non-heterosexual women. Similarly, in assessing the severity of gender dysphoria among adolescents with gender identity disorder, transvestite boys, and control group, Singh et al. showed the greater severity of gender dysphoria in homosexuals compared to non-homosexuals [31]. In a study conducted by Deogracias et al., the gender dysphoria score was not significantly different in men or women in heterosexual and non-heterosexual groups [24]. Smith et al. found no significant difference in the gender dysphoria score after surgery between homosexuals and non-homosexuals subgroups [25].

Conclusion

The Persian version of the Dimensional Measure of gender identity disorder questionnaire has a favorable internal consistency and, with very high sensitivity and specificity, is able to separate patients with gender dysphoria from non-patients. This questionnaire has a homogeneous structure and is independent of similar variables such as sex roles. However, its applicability to specific clinical groups has not yet been assessed.

Limitations and Recommendations: The limitations of the present study included a very low number of men with gender dysphoria and lower still number of participating parents in this group. Also, after the analysis of the results, an attempt was made to have two separate control groups (patients with gender complaints and their relatives), but to no avail. There was no sample of children with gender dysphoria and therefore, parents' information about patients' childhood was used, which involved recollection bias.

The use of specific control groups (such as a clinical sample of homosexual or bisexual men and women, transsexual men, and different intersexual modes) in future studies is recommended. Moreover, a test-retest assessment of the reliability of the questionnaire is also required.

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