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Chapter 3

The Utrecht Gender Dysphoria Scale: A Validation Study

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Abstract

This study aimed to validate the male (UGDS-M) and female (UGDS-F) versions of the Utrecht Gender Dysphoria Scale (UGDS), a dimensional scale that aims to measure gender dysphoria. The 12-item UGDS scale was administered to 648 transgender participants (545 diagnosed with a gender identity disorder (GID), 103 who were subthreshold for GID), 60 participants with a disorder of sex development (DSD), and 219 non-transgender heterosexual and 192 non-transgender homosexual/lesbian or bisexual controls. A principal component analysis showed a one-factor solution, accounting for 79.96% of the variance in natal males and 80.25% in natal females. Both the UGDS-M and the UGDS-F mean total scores (Cronbach's alphas .98 for both versions) showed that there was significantly more gender dysphoria in participants diagnosed with GID, compared to participants subthreshold for GID. The two transgender groups showed significantly more gender dysphoria than the DSD and control participants. In natal females, lesbian/bisexual control individuals showed more gender dysphoria, compared to heterosexual and DSD participants. In natal males, no significant differences between the control participants and the DSD groups were observed. Both UGDS versions showed to have a strong ability to discriminate between clinically referred gender dysphoric individuals and non-clinically referred controls and DSD participants, sensitivity was 88.3% (UGDS-M) and 98.5% (UGDS-F), specificity was 99.5% (UGDS-M) and 97.9% (UGDS-F).

Introduction

In the current Standards of Care of the World Professional Association for Transgender Health (Coleman et al. 2012), gender nonconformity and gender dysphoria are described as distinct but related phenomena. *Gender nonconformity* refers to the extent to which a person's gender identity, - role, or - expression differs from the cultural norms prescribed to a particular sex. *Gender dysphoria* refers to the sense of discomfort or distress resulting from incongruence between gender identity and assigned gender (Fisk 1973). Both phenomena can be placed onto a spectrum or continuum of gender variance, ranging from mild expressions of gender nonconformity (cross-gender behaviors, interests and preferences) without any accompanying distress, to forms of gender nonconformity resulting in intense distress (gender dysphoria) and a need for clinical attention (Meyer-Bahlburg 2010). At present, gender dysphoria has increasingly been conceptualized as a dimensional phenomenon (see for an overview Cohen-Kettenis and Pfäfflin

2010). Such a conceptualization makes it possible for clinicians to evaluate the intensity of gender dysphoria with a dimensional measure. In this process, the use of short, validated questionnaires with good psychometric properties can be of value. In the current study, we further validate the Utrecht Gender Dysphoria Scale (UGDS; Doorn et al. 1996), a dimensional scale that aims to measure gender dysphoria.

Individuals who fulfill the current DSM-IV-TR criteria for gender identity disorder (GID) (American Psychiatric Association 2000), show a strong and persistent cross-gender identification and an aversion towards one's natal sex, which is accompanied by distress and/or impairment. In adolescents and adults, the condition is manifested by frequently passing as the other sex, the desire to live or be treated as the other sex, or the conviction that one has the typical feelings and reactions of the other sex. The condition is also accompanied by a desire to be rid of primary and secondary sex characteristics, a desire for medical procedures to physically alter sexual characteristics to simulate the other sex, or a belief that one is born the wrong sex (e.g. Cohen-Kettenis and Pfäfflin 2010; Zucker 2010, but see for proposed DSM-5 criteria, APA 2012). GID in late adolescence and adulthood is relatively rare (approximately 1:7.400 to 1:100.000 in natal males and 1:30.400 to 1:400.000 in natal females; see for overview Zucker and Lawrence 2009), but these numbers may be an underestimation of the true prevalence (de Vries and Cohen-Kettenis 2012; Olyslager and Conway 2007; Reed et al. 2009; Wood et al. 2012; Zucker et al. 2008). Prevalence of gender dysphoria in the general population may be much higher, as not all gender dysphoric individuals experience a complete cross-gender identity (Diamond and Butterworth 2008), and not every gender dysphoric individual desires to live (permanently) in the role of the 'other gender' (e.g. Bockting 2008; Bornstein 1994; Ekins and King 2006; Lev 2005, see for an overview Cohen-Kettenis and Pfäfflin 2010). Many of these individuals may not have been included in current prevalence studies. In this respect, a recent Dutch study by Kuyper (2012), on a sample of 8064 participants from the general population, showed that ambivalence in gender identity was present in 4.6% of the males and 3.2% of the females, and feelings of gender incongruence in 1.1% of the males and 0.8% of the females. Such feelings, accompanied with an aversion towards one's body *and* a desire for gender-reassignment were reported by 0.6% of the males and 0.2% of the females.

Expressions of gender variance (gender nonconformity and/or gender dysphoria) are found to be associated with a homosexual or lesbian sexual orientation. Retrospective (Bailey and Zucker 1995; Zucker et al. 2006) and prospective studies (e.g. Drummond et al. 2008; Steensma et al. 2011; Steensma et al. 2012a; Wallien and Cohen-Kettenis 2008 for an overview of

older studies, see Zucker and Bradley 1995), show that a homosexual orientation in adulthood is associated with the presence of gender variance in childhood. In studies on adults, the report of current gender nonconformity is increased in homosexuals and lesbians compared to heterosexual counterparts (e.g. Lippa 2005; 2008). There are also indications that some homosexual and lesbian individuals experience gender dysphoria (e.g. Bullough and Bullough 1993; 1997; Lee 2001).

Disorders of sex development are congenital conditions in which the development of chromosomal, gonadal and/or anatomical sex is atypical (Hughes et al. 2006). In this group, the gender development is more often contrary to the gender of rearing than in non-DSD persons (e.g. Cohen-Kettenis 2010; Dessens et al. 2005; Mazur 2005; Zucker 1999). To what extent this is the result of biological factors or environmental / cultural factors is still unclear. In some conditions there is primarily gender nonconformity in behavior, such as in female raised 46,XX individuals with congenital adrenal hyperplasia (CAH) (e.g. Berenbaum and Bailey 2003; Berenbaum and Hines 1992; Meyer-Bahlburg et al. 2004; Nordenstrom et al. 2002; Paterski et al. 2005). In other conditions, the risk of gender dysphoria, accompanied with a desire to change gender is substantial, such as in 46,XY female raised individuals who have androgen biosynthesis deficiencies (5 α -RD-2 and 17 β -HSD-3) (see for a review, de Vries et al. 2007).

Measures that are commonly used to examine the presence and/or the intensity of gender dysphoria in children, adolescents and adults have been described in detail by Zucker (2005). In contrast to the variety of instruments for children, dimensional measures to assess gender dysphoria in adolescents and adults are less available. With regard to the instruments that do exist for adolescents and adults, the validity of these measures has usually not been studied (Zucker 2005). An exception in this respect is The Gender Identity/Gender Dysphoria Questionnaire for Adolescents and Adults (GIDYQ-AA, Deogracias et al. 2007; Singh et al. 2010), a 27-item questionnaire measuring gender identity and gender dysphoria with good reliability and discriminant validity.

In the current study we have investigated the male and female version of the UGDS. The UGDS is a shorter instrument than the GIDYQ-AA. It was constructed to evaluate the effects of gender reassignment in the first prospective Dutch follow-up study (Doorn et al. 1996). Later it was also used in other Dutch follow-up studies (Cohen-Kettenis and van Goozen 1997; de Vries et al. 2011a) and other international / foreign studies (Jürgensen et al. 2012; Kreukels et al. 2012; Spack et al. 2012). Because the scale has never been extensively validated, we will do so in a sample of 1119 participants,

consisting of clinically referred transgender individuals, a group of DSD patients, and heterosexual, homosexual and bisexual control participants.

Method

Participants and procedure

A total of 1119 participants (561 natal males, 558 natal females) were recruited from several populations (see Table 1 for the number of participants, sex distribution, and mean ages).

The clinical transgender group consisted of 297 adolescents (136 natal boys, 161 natal girls), and 363 adults (251 natal males, 112 natal females), referred to the Gender Identity Clinic at the vU University Medical Center, Amsterdam. The diagnosis was set by a psychologist or psychiatrist who evaluated whether the patient fulfilled the DSM-IV criteria for GID (American Psychiatric Association 2000) and assessed readiness for treatment. For both the adolescents, referred between 1996 and 2009, and adults, referred between 2007 and 2009, data was obtained during the diagnostic phase (see for details on adolescent treatment: Cohen-Kettenis et al. (2008), and on data collection in adults; Kreukels et al. 2012). All adolescent participants could be included in the study. With regard to the adults, 12 participants were excluded because of incomplete UGDs data (more than 4 items missing). The remaining 648 adolescents and adults were divided in two groups; (1) a group who fulfilled all criteria for a GID diagnosis (N=545, 255 adolescents, 290 adults), (2) a group subthreshold for GID; they did not fulfill all criteria for a GID (N=103, 42 adolescents, 61 adults) (DSM-IV or DSM-IV-TR, American Psychiatric Association 1994; 2000).

A second group consisted of 60 adolescents with a DSD diagnosis. Recruitment and data collection primarily took place in four study centers in Germany (see for detailed information Jürgensen et al. 2012). Patients were classified into four groups: (1) *DSD-XY-P-F*: Patients with XY-karyotype and partial androgen effects, reared and living as girls. Included are the diagnoses partial androgen insensitivity syndrome (N=5), partial or mixed gonadal dysgenesis (N=5), disorders of androgen biosynthesis (N=5), severe hypospadias (N=1), and two patients with an unclassified clinical diagnosis of DSD. (2) *DSD-XY-C-F*: Patients with XY-karyotype and without androgen effects, reared and living as girls. The group includes patients with complete androgen insensitivity syndrome (N=4), and complete gonadal dysgenesis (N=3). (3) *DSD-XX*: Patients with XX-karyotype and partial androgen effects, reared and living as girls. This group consisted largely of girls with congeni-

tal adrenal hyperplasia (N=27), and two patients were suffering from aromatase deficiency. (4) *DSD-XY-P-M*: Patients with XY-karyotype and partial androgen effects, reared and living as boys. This group consisted of patients with severe hypospadias (N=2), disorders of androgen biosynthesis (N=1), patients with partial androgen insensitivity syndrome (N=2), and one patient with an unclassified clinical diagnosis of DSD.

Table 1 Study sample

| Groups | Total | Males | Females | Age | | |
|----------------------|-------|-------|---------|-------|-------|-------|
| | N | N | N | M | SD | Range |
| Transgender group | 648 | 376 | 272 | 25.09 | 13.75 | 12-75 |
| GID | 545 | 286 | 259 | 24.80 | 13.59 | 12-75 |
| Subthreshold | 103 | 90 | 13 | 26.62 | 14.51 | 12-62 |
| DSD group | 60 | 6 | 54 | 14.50 | 1.13 | 13-17 |
| DSD-XY-P-F | 18 | -- | 18 | 14.6 | 1.0 | 13-16 |
| DSD-XY-C-F | 7 | -- | 7 | 14.3 | 1.6 | 13-16 |
| DSD-XX | 29 | -- | 29 | 14.5 | 1.1 | 13-17 |
| DSD-XY-P-M | 6 | 6 | -- | 14.5 | 1.1 | 13-16 |
| Control group | 411 | 179 | 232 | 25.39 | 11.61 | 12-69 |
| Heterosexual | 219 | 92 | 127 | 21.88 | 8.56 | 12-64 |
| Homosexuals/lesbians | 150 | 70 | 80 | 29.07 | 12.75 | 12-66 |
| Bisexuals | 42 | 17 | 25 | 30.60 | 15.01 | 13-69 |
| Total | 1119 | 561 | 558 | 24.63 | 12.83 | 12-75 |

Note. GID: gender identity disorder; DSD: disorder of sex development; *DSD-XY-P-F* = XY-karyotype and partial androgen effects, reared as females; *DSD-XY-C-F* = XY-karyotype and complete lack of androgen effects, reared as females; *DSD-XX* = XX-karyotype and partial androgen effects, reared as females; *DSD-XY-P-M* = XY-karyotype and partial androgen effects, reared as males.

Non-clinical participants were recruited by e-mail to persons within the private network of the researchers, using the principle of snowballing, and online advertisement on several Dutch websites for adolescents and adults with a bisexual, homosexual or lesbian sexual orientation (www.gk.nl, www.expreszo.nl, www.gaysite.nl, www.zijaanzij.nl, www.kamkrant.nl). The e-mail and advertisement referred to an online link at the server of the VU

University Medical Center, where one could fill out the questionnaire anonymously. Four hundred and fifty one persons filled out the questionnaire, 40 participants were excluded because of incomplete UGDS data (more than 4 items missing) or the absence of essential background information (sex, age or sexual orientation). The sample therefore consisted of 411 participants (219 heterosexuals, 150 homosexuals / lesbians, 42 bisexuals).

Measures

Gender identity/dysphoria

The *Utrecht Gender Dysphoria Scale* (UGDS) was used to measure the intensity of gender dysphoria. The questionnaire consists of 12 statements, answers are given on a five-point scale to indicate to what extent one agrees or disagrees (1= agree completely, 2 = agree somewhat, 3 = neutral, 4 = disagree somewhat, and 5 = disagree completely). There are separate versions of the UGDS for males (UGDS-M) and females (UGDS-F) (see Table 2 for the UGDS-M version and Table 3 for the UGDS-F version). In the DSD group, the UGDS-M or UGDS-F versions were used based on the gender of rearing. Cronbach's alpha was .92 for UGDS-M, and .78 for UGDS-F (Doorn et al. 1996). To calculate the total score, all items of the UGDS-M, and item 1, 2, 4-6, 10-12 of the UGDS-F, have to be recoded (1=5, 2=4, 3=3, 4=2, 5=1) and summed. Higher scores indicate more gender dysphoria (range 12 – 60).

Sexual orientation

Sexual orientation was assessed through a single question in the control participants: *'How do you identify yourself?'* (sexual identity). For the transgender adolescents and adults sexual orientation was assessed through the question *'To whom do you feel sexually attracted?'* (sexual attraction). The questions were rated on a seven-point scale ranging from exclusively heterosexual (0) to exclusively homosexual (6) (Kinsey et al. 1948). According to their scores, the control participants were classified in three sexual orientation categories: (1) heterosexual (Kinsey rating 0-1), (2) bisexual (Kinsey rating 2-4), and (3) homosexual or lesbian (Kinsey rating 5-6). The transgender participants were classified in two sexual orientation categories, based on their natal sex: (1) non-homosexual (Kinsey rating 0-4), and (2) homosexual or lesbian (Kinsey rating 5-6). Sexual orientation was not assessed for the DSD participants.

Statistical analyses

To verify the psychometric properties of the UGDS-M and UGDS-F versions, a principal component analysis was performed and Cronbach's alphas were calculated to check the reliability of both scales, using the total sample of

natal females and natal males. Group differences for age were analyzed with use of an one-way ANOVA, using Tukey's honestly significant difference tests as Post Hoc tests. To check for an association between the total UGDS mean score and age within the total sample a Pearson product moment correlation was performed. Differences for the total UGDS mean score between homosexual and non-homosexual transgender participants were verified by performing independent samples t-tests. In order to assess discriminant validity, group differences with regard to the total UGDS mean score analyses of variance (ANOVA's) were performed, using Tukey's honestly significant difference tests as Post Hoc tests.

Results

Factor Analysis

Both the UGDS-M and UGDS-F showed a one-factor solution. In natal males, the factor accounted for 79.96% of the total variance. Item-total correlations ranged from .81 to .94, Cronbach's alpha was .98. In natal females, the factor accounted for 80.25% of the total variance. Item-total correlations ranged from .71 to .96, Cronbach's alpha was .98.

Discriminant validity

A significant difference in age was observed between the transgender group, the DSD groups and the control groups (heterosexuals, homosexuals/lesbians and bisexuals) ($F(2,1116) = 20.53, p < .001$). No differences in age were observed between the transgender group and control groups. The DSD participants were significantly younger than the transgender ($p < .001$) and control participants ($p < .001$) (see Table 1). We therefore checked whether the UGDS score was associated with age. As the Pearson product-moment correlation showed no significant association between the UGDS score and age within the total sample ($r = .05, p = ns$), age was not incorporated as a covariate in further analyses.

In the transgender group, of the 648 participants, 464 (71.6%) reported to have a homosexual orientation (n=218; 58.0% natal males, n=246; 90.4% natal females), 144 (22.2%) indicated a non-homosexual orientation (n=128; 34.0% natal males, n=16; 5.9% natal females), and 40 (6.2%) did not report a sexual orientation (n=30; 8.0% natal males, n=10; 3.7% natal females). Differences in total UGDS mean scores between homosexual and non-homosexual transgender participants were not significant in both the transgender males (homosexuals, $M=49.65, SD=8.90$ vs. non-homosexual, $M=50.83, SD=7.39$), and the transgender females (homosexuals, $M=55.70,$

$SD=4.89$ vs. non-homosexual, $M=57.63$, $SD=2.83$). Because of this, the transgender participants were not subdivided by sexual orientation in the analyses.

UGDS-Male version

Within the male control participants, preliminary analyses showed no significant differences between the homosexual and the bisexual individuals with regard to their UGDS-M score ($M=16.10$, $SD=7.07$ vs. $M=17.76$, $SD=6.98$). Because of this, both groups were combined.

Table 2 shows the means for the total UGDS-M score and item scores over the five groups of natal males. There were significant group differences for the total UGDS-M score ($F(4,556) = 1151.45$, $p < .001$). Participants with a diagnosis of GID had a significantly higher UGDS score, compared to the participants who were subthreshold for GID ($p < .001$). Both transgender groups, GID and subthreshold, had significantly higher gender dysphoria scores than the control participants and the DSD-XY-P-M participants ($p < .001$). No significant differences were observed between the control participants and the DSD-XY-P-M group.

On item level, the trend of group differences for all items was equivalent to the group differences for the total UGDS scores, except for item 9; '*I dislike urinating in a standing position*'. Interestingly, the dislike to urinate in a standing position was higher in the homosexual/bisexual group than in the heterosexual and DSD-XY-P-M groups ($p < .05$).

UGDS-Female version

As for the UGDS-F, we did not find significant differences in the total UGDS-F mean scores between the lesbian and bisexual groups ($M=22.19$, $SD=8.12$ vs. $M=22.52$, $SD=7.23$), and within the DSD groups (DSD-XX ($M=18.72$, $SD=5.11$), DSD-XY-P-F ($M=19.06$, $SD=4.52$), and DSD-XY-C-F ($M=17.45$, $SD=2.22$)). Because of this, the lesbian and bisexual groups were combined, and the DSD groups were combined in the analyses.

Significant group differences were observed for the total UGDS-F mean score in the five groups of natal females ($F(4,553) = 1880.68$, $p < .001$) (see Table 3 for total mean UGDS-F score and item scores per subgroup). The gender dysphoria score was significantly higher for the transgender group with a GID diagnosis, compared to the participants who were subthreshold for GID ($p < .001$). Both transgender groups reported more gender dysphoria than the control groups and the DSD group ($p < .001$). The lesbian/bisexual control females reported more gender dysphoria than the heterosexual control females and DSD participants ($p < .001$). No significant difference was observed between the heterosexual control females and the DSD group.

Table 2 UGDS-Male version; total score and item means per subgroup

| | GID (N=286) | | Subthreshold (N=90) | | HT Controls (N=92) | | HS/BS Controls (N=87) | | DSD-XY-P-M (N=6) | |
|--|--------------------|------|---------------------|------|---------------------|------|-----------------------|------|---------------------|------|
| | M | SD | M | SD | M | SD | M | SD | M | SD |
| UGDS-M Total score | 53.66 _a | 4.96 | 39.51 _b | 7.60 | 14.51 _{ab} | 6.10 | 16.42 _{ab} | 7.04 | 14.00 _{ab} | 4.00 |
| 1. My life would be meaningless if I would have to live as a boy/man | 4.54 _a | .73 | 3.08 _b | 1.23 | 1.22 _{ab} | .68 | 1.28 _{ab} | .81 | 1.50 _{ab} | 1.23 |
| 2. Every time someone treats me like a boy/man I feel hurt | 4.47 _a | .79 | 3.27 _b | 1.28 | 1.14 _{ab} | .55 | 1.32 _{ab} | .85 | 1.17 _{ab} | .41 |
| 3. I feel unhappy if someone calls me a boy/man | 4.52 _a | .81 | 3.28 _b | 1.28 | 1.41 _{ab} | .84 | 1.54 _{ab} | 1.04 | 1.00 _{ab} | .00 |
| 4. I feel unhappy because I have a male body | 4.80 _a | .56 | 3.86 _b | 1.07 | 1.25 _{ab} | .85 | 1.34 _{ab} | .91 | 1.00 _{ab} | .00 |
| 5. The idea that I will always be a boy/man gives me a sinking feeling | 4.82 _a | .49 | 3.88 _b | 1.24 | 1.14 _{ab} | .57 | 1.38 _{ab} | .94 | 1.00 _{ab} | .00 |
| 6. I hate myself because I am a boy/man | 4.00 _a | 1.12 | 2.96 _b | 1.33 | 1.13 _{ab} | .47 | 1.13 _{ab} | .53 | 1.00 _{ab} | .00 |
| 7. I feel uncomfortable behaving like a boy/man, always and everywhere | 4.38 _a | .92 | 3.23 _b | 1.25 | 1.22 _{ab} | .65 | 1.51 _{ab} | 1.04 | 1.00 _{ab} | .00 |
| 8. Only as a girl/woman my life would be worth living | 4.52 _a | .87 | 3.14 _b | 1.26 | 1.18 _{ab} | .55 | 1.31 _{ab} | .83 | 1.00 _{ab} | .00 |
| 9. I dislike urinating in a standing position | 4.57 _a | .81 | 3.47 _b | 1.33 | 1.23 _{ab} | .73 | 1.67 _{abc} | 1.31 | 1.00 _{ab} | .00 |
| 10. I am dissatisfied with my beard growth because it makes me look like a boy/man | 4.80 _a | .82 | 3.97 _b | 1.37 | 1.26 _{ab} | .86 | 1.56 _{ab} | 1.15 | 1.67 _{ab} | 1.63 |
| 11. I dislike having erections | 4.45 _a | .93 | 3.18 _b | 1.14 | 1.25 _{ab} | .75 | 1.23 _{ab} | .63 | 1.67 _{ab} | 1.03 |
| 12. It would be better not to live than to live as a boy/man. | 3.79 _a | 1.33 | 2.22 _b | 1.18 | 1.09 _{ab} | .38 | 1.10 _{ab} | .51 | 1.00 _{ab} | .00 |

Note. Means with differing subscripts within rows are significantly different at $p < .05$.

Table 3 UGDS-Female version; total score and item means per subgroup

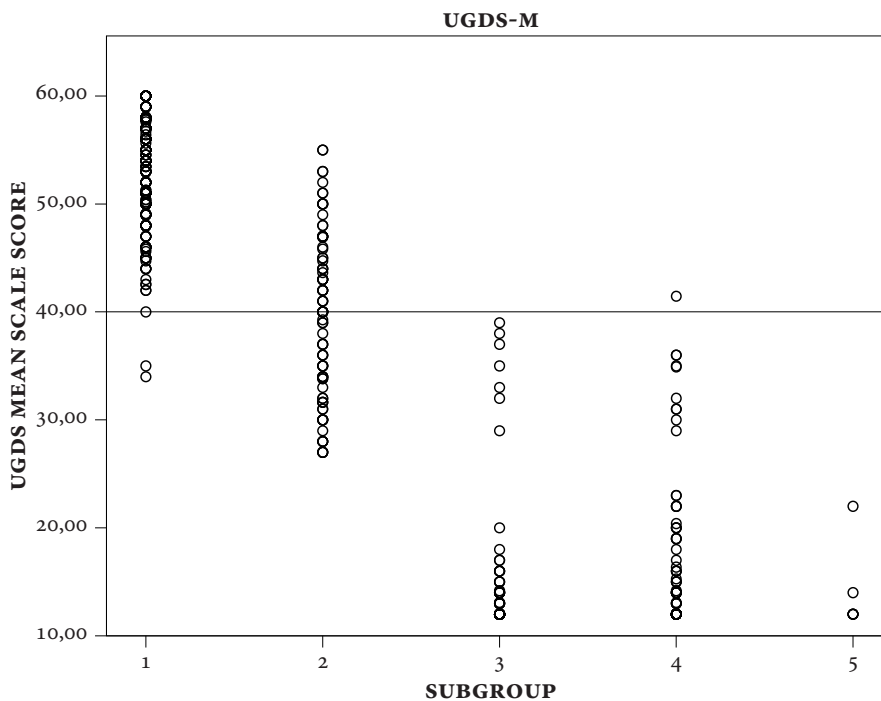
| | GID (N=259) | | Subthreshold (N=13) | | HT Controls (N=127) | | HS/BS Controls (N=105) | | DSDs (N=54) | |
|--|--------------------|------|------------------------|------|------------------------|------|---------------------------|------|---------------------|------|
| | M | SD | M | SD | M | SD | M | SD | M | SD |
| UGDS-F Total score | 56.30 _a | 3.70 | 43.01 _b | 7.60 | 17.02 _{ab} | 4.25 | 22.27 _{abc} | 7.89 | 18.67 _{ab} | 4.60 |
| 1. I prefer to behave like a boy/mam | 4.96 _a | .24 | 4.17 _b | .84 | 1.28 _{ab} | .63 | 2.10 _{abc} | 1.11 | 1.26 _{ab} | .62 |
| 2. Every time someone treats me like a girl/woman I feel hurt | 4.38 _a | .94 | 2.46 _b | 1.51 | 1.13 _{ab} | .44 | 1.52 _{abc} | .93 | 1.13 _{ab} | .39 |
| 3. I love to live as a girl/woman * | 4.86 _a | .57 | 3.92 _b | 1.19 | 1.28 _{ab} | .806 | 1.64 _{abc} | .99 | 1.15 _{ab} | .41 |
| 4. I continuously want to be treated like a boy/man | 4.83 _a | .48 | 3.77 _b | 1.01 | 1.09 _{ab} | .36 | 1.42 _{abc} | .93 | 1.06 _{ab} | .30 |
| 5. A boy's/man's life is more attractive for me than a girl's/woman's life | 4.88 _a | .43 | 3.92 _b | .86 | 1.29 _{ab} | .71 | 1.87 _{abc} | 1.14 | 1.13 _{ab} | .44 |
| 6. I feel unhappy because I have to behave like a girl/woman | 3.97 _a | 1.44 | 2.83 _a | 1.47 | 1.32 _b | .93 | 1.78 _{ab} | 1.05 | 1.35 _b | .89 |
| 7. Living as a girl/woman is something positive for me * | 4.68 _a | .73 | 3.31 _b | 1.03 | 1.33 _{ab} | .78 | 1.85 _{abc} | 1.04 | 1.29 _{ab} | .70 |
| 8. I enjoy seeing my naked body in the mirror * | 4.67 _a | .76 | 3.54 _b | 1.27 | 2.69 _{ab} | 1.26 | 2.68 _{ab} | 1.28 | 3.50 _b | 1.15 |
| 9. I like to behave sexually as a girl/woman * | 4.92 _a | .35 | 4.25 _b | 1.06 | 1.66 _{ab} | .99 | 1.86 _{ab} | 1.00 | 2.44 _{abc} | 1.16 |
| 10. I hate menstruating because it makes me feel like a girl/woman | 4.45 _a | 1.14 | 3.09 _b | 1.58 | 1.50 _{ab} | 1.01 | 1.91 _{abc} | 1.24 | 1.93 _{abc} | 1.08 |
| 11. I hate having breasts | 4.68 _a | 1.01 | 3.69 _b | 1.50 | 1.29 _{ab} | .77 | 1.84 _{abc} | 1.25 | 1.26 _{ab} | .68 |
| 12. I wish I had been born as a boy/man | 4.96 _a | .22 | 4.00 _b | 1.16 | 1.18 _{ab} | .64 | 1.78 _{abc} | 1.19 | 1.30 _{ab} | .72 |

Note. Means with differing subscripts within rows are significantly different at $p < .05$.

* For items 3, 7, 8, and 9; higher scores are reflecting more negativity and dislike towards the item content.

For items 1-5, 7, 11, and 12 of the UGDS-F, a similar trend in group differences was observed as in the analyses for the total UGDS-F mean score. There were, however, a few exceptions. With regard to item 6; *'I feel unhappy because I have to behave like a girl/woman'*, the clinically referred females with GID did not significantly differ from the GID subthreshold group, and lesbian/bisexual control females reported more unhappiness than the heterosexual control females and DSD participants ($p < .05$). Regarding item 8; *'I enjoy seeing my naked body in the mirror'*, DSD participants did not differ significantly from the GID subthreshold group and had a higher score than the heterosexual and lesbian/bisexual control females ($p < .001$). Regarding item 9; *'I like to behave sexually as a girl/woman'*, the DSD participants reported more disagreement than the heterosexual and lesbian/bisexual control females ($p < .001$). Heterosexual and lesbian/bisexual control females did not significantly differ from each other. Finally, on item 10;

Figure 1 Distribution of the total UGDS score as a function of subgroup for the UGDS-M



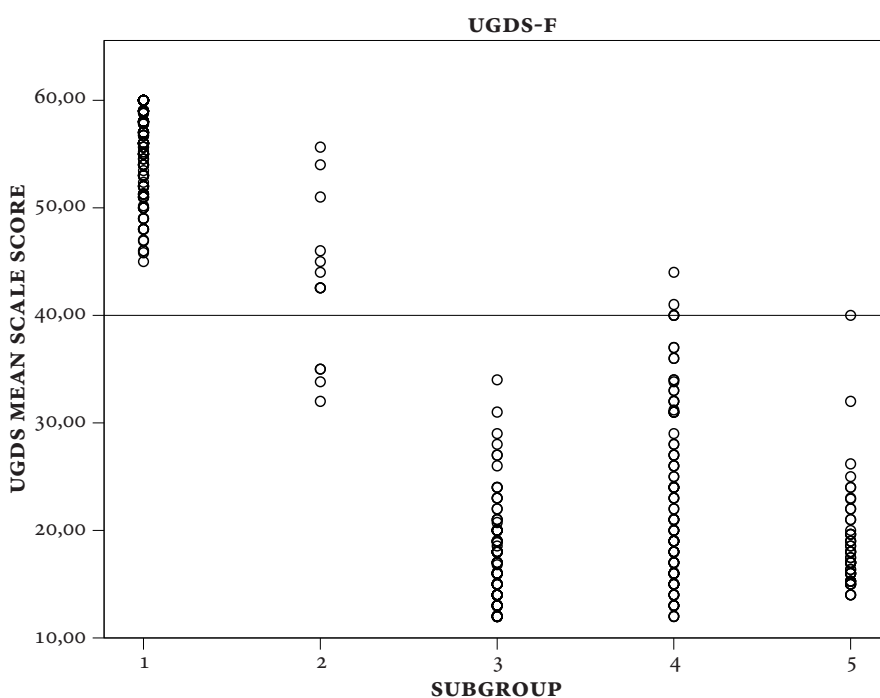
Note. (1) Transgender group with diagnosis GID, (2) Transgender group subthreshold for GID, (3) Heterosexual controls, (4) Homosexual & Bisexual controls, (5) DSD-XY-P-M subgroup; The horizontal line at 40.00 represents the cutoff score.

'I hate menstruating because it makes me feel like a girl/woman', lesbian/bisexual control females and DSD participants had a significantly higher score than heterosexual control females ($p < .05$).

Sensitivity and specificity

To check how the UGDS versions would discriminate between clinically referred participants and non-clinically referred participants (control groups and DSDs) we visually inspected the frequency distribution of the UGDS-M and UGDS-F version to set a cut-point for sensitivity and specificity. Selecting a cut-point of 40, we found a sensitivity percentage of 88.3% for the clinically referred participants and a specificity percentage of 99.5% for the non-clinically referred participants in the UGDS-M. For the UGDS-F the sensitivity was 98.5% for clinically referred participant and the specificity was 97.9% for the non-clinically referred participants (see Figures 1 and 2).

Figure 2 Distribution of the total UGDS score as a function of subgroup for the UGDS-F



Note. (1) Transgender group with diagnosis GID, (2) Transgender group subthreshold for GID, (3) Heterosexual controls, (4) Lesbian & Bisexual controls, (5) DSD subgroup (DSD-XY-P-F, DSD-XY-C-F, DSD-XX); The horizontal line at 40.00 represents the cutoff score.

Discussion

This study aimed to further validate the Utrecht Gender Dysphoria Scale, a dimensional scale that aims to measure the intensity of gender dysphoria. Checking previously found characteristics of the scale (Doorn et al. 1996), a principal component analysis again identified a strong one-factor solution and the internal reliability, represented by Cronbach's alpha, appeared to be very high and similar for both versions (.98).

Although the UGDS-M and UGDS-F versions include a couple of different questions, and are therefore not entirely comparable, the psychometric characteristics appeared to be very similar. We only found that the sensitivity and specificity, which were quite good for both versions of the UGDS, were somewhat better for the UGDS-F version. This may be caused by a difference in reported gender dysphoria between the transgender natal male and transgender natal female subthreshold participants. Beside the low number of transgender females in the subthreshold group, causing a loss of statistical power, visual inspection of figure 1 and 2, and a lower total UGDS mean score in the transgender male subthreshold group, leads one to suspect that the transgender male subthreshold group is more heterogeneous, compared to the subthreshold transgender female group. This heterogeneity may have caused an increase in false negatives, and have lowered the sensitivity for the UGDS-M version. Such heterogeneity is in line with studies showing that natal males attending gender identity clinics are more diverse in e.g. age of onset (e.g. Nieder et al. 2011), and sexual orientation (e.g. Lawrence 2010; Nieder et al. 2011, Smith et al. 2005a), in comparison to transgender females.

In accordance with what one may expect from a valid scale, for both UGDS versions clear differences were found between the participants diagnosed with GID and those who were subthreshold for GID. Also, both transgender groups differed significantly from the control participants in the expected direction. The fact that we did not find differences between the control groups and the DSD participants may be explained by the fact that the DSD participants were not seeking treatment for gender issues. These participants were recruited for a clinical evaluation study to assess their quality of life, gender identity, treatment satisfaction, coping, and problems, that may be associated with their diagnosis and/or treatment (Lux et al. 2009). It is conceivable that DSD individuals, struggling with gender dysphoria had been less willing to participate in this evaluation study.

The finding of elevated gender dysphoria in lesbian/bisexual control females, as compared to heterosexual females, is partially in line with earlier findings by Deogracias et al. (2007) and Singh et al. (2010). They observed

that nonheterosexual females (but also nonheterosexual males) scored in-between the heterosexual and gender dysphoric groups. The fact that we did not observe scores in-between heterosexual and transgender natal male groups for the nonheterosexual males in our study may again be explained by the heterogeneity within the natal male control groups. Compared to the heterosexual control females, the variance in UGDS scores was higher among the heterosexual control male participants. As a result, it may have been harder to detect a difference between the heterosexual and homosexual/bisexual control male participants. As Deogracias et al. (2007) and Singh et al. (2010) did find a difference in reported gender dysphoria between the heterosexual and homosexual/bisexual men, this explanation seems more likely than that there were no real differences between the two groups.

When looking at the UGDS on item level, most of the items appeared to behave in accordance with the total score outcomes. There were, however, a few exceptions, which were mostly easy to understand. Examples are the lack of difference in scores between the GID and subthreshold GID groups and the significant difference between the lesbian/bisexual and heterosexual control females with regard to the felt pressure to behave in a sex typical feminine way. Taking the physical consequences in some DSD conditions (e.g. due to genital surgery, growth problems, or absence of pubic hair), and the frequently reported sexual problems in DSD into account (e.g. Köhler et al. 2012; Minto et al. 2003; Schober 2004; Schönbacher et al. 2010), it is equally understandable why females with DSD did not like looking at their naked body in the mirror and/or behaving sexually as a girl/woman, compared to heterosexual and lesbian/bisexual control females. The finding that lesbian/ bisexual control females and females with DSD report not to like menstruating more often than heterosexual females may be related to having more problems with menstruation per se. For the DSD females menstrual problems are sometimes inherent to the DSD, for the lesbian/bisexual females the problems may be related to a higher incidence for conditions such as polycystic ovaries or polycystic ovary syndrome (Agrawal et al. 2004). The only difference that was less easily explainable, however interesting, was the finding that homosexual / bisexual control males more often seemed to prefer to urinate in a sitting position than heterosexual males.

Limitations and suggestions for future research

Although this study reported on a fairly high number of participants, the size of samples was not particularly high for the subthreshold GID groups and the male DSD participants. Future validation studies preferably should incorporate larger subsamples and other instruments, measuring gender dysphoria (e.g. GIDYQ-AA), in order to assess the convergent validity.

Conclusion

The UGDS appears to be a reliable scale with satisfactory sensitivity and specificity.

The UGDS scale is short and easy to fill out, measures gender dysphoria in a dimensional way and discriminates well between clinical and non-clinical groups. Within gender dysphoric groups it also discriminates between individuals with less and more extreme gender dysphoria. From follow-up studies it was already known that gender dysphoria, as measured by the UGDS, disappeared post gender reassignment. These qualities make the instrument useful for clinical and research purposes.