
ORIGINAL RESEARCH—INTERSEX AND GENDER IDENTITY

Sociodemographic Study of Danish Individuals Diagnosed with Transsexualism

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ABSTRACT

Introduction. Male-to-female (MtF) and female-to-male (FtM) individuals with transsexualism (International Classification of Diseases-10) may differ in core clinical and sociodemographic variables such as age, sexual orientation, marriage and parenthood, school, educational level, and employment. Assessing and understanding the implication of such differences may be a key to developing appropriate and effective treatment and intervention strategies for this group. However, research in the area remains sparse and is often on small populations, making the generalization of results from current studies on individuals diagnosed with transsexualism difficult.

Aims. (i) To describe and assess key sociodemographic and treatment-related differences between MtF and FtM individuals in a Danish population of individuals diagnosed with transsexualism; (ii) to assess possible implications of such difference, if any, for clinical treatment initiatives for individuals diagnosed with transsexualism.

Methods. Follow-up of 108 individuals who had permission to undergo sex reassignment surgery (SRS, meaning castration and genital plastic surgery) over a 30-year period from 1978 to 2008 through the Gender Identity Unit in Copenhagen, Denmark. The individuals were identified through Social Security numbers. Clinical and sociodemographic data from medical records were collected.

Results. The sex ratio was 1.16:1 (MtF : FtM). Mean age at first referral was 26.9 (standard deviation [SD] 8.8) years for FtM and 30.2 (SD 9.7) for MtF individuals. Compared with MtF, FtM had a significantly lower onset age (before 12 years of age) and lower age when permission for SRS was granted. Further, FtM individuals were significantly more often gynephilic (sexually attracted to females) during research period and less likely to start self-initiated hormonal sex reassignment (SR) (treatment with cross-sex hormones). The MtF and FtM groups did not differ in years of school, educational level, employment, or engagement in marriage and cohabitation.

Conclusions. As approximately half of MtF started cross-sex hormonal SR without attending a gender unit, future treatment needs to focus on this group of MtF individuals in order to accommodate the medical risks of self-initiated hormonal treatment. Earlier intervention with adolescents appears necessary since three-quarters of FtM individuals before age 12 had problems with their assigned sex. For both MtF and FtM, we found problems in areas of school, education, and employment and recommend further help in these core areas. **Simonsen R, Hald GM, Giraldi A, and Kristensen E. Sociodemographic study of danish individuals diagnosed with transsexualism. Sex Med 2015;3:109–117.**

Key Words. Transsexualism; Sociodemographic; Denmark

Introduction

In the World Health Organization classification system, International Classification of Diseases (ICD)-10, transsexualism is categorized in the group of “disorders of adult personality and behavior,” specifically in the subgroup of “gender identity disorders” [1]. Central to the condition is that an individual with normal somatic sexual differentiation is unalterably convinced that she/he belongs to the opposite sex [2,3].

According to the ICD-10, the following three criteria must be met before an individual may be diagnosed with transsexualism: (i) the person has the desire to live and be accepted as a member of the opposite sex; (ii) usually accompanied by a sense of discomfort with or inappropriateness of one’s anatomic sex; and (iii) a wish to have surgery and/or hormonal treatment to make one’s body as congruent as possible with one’s preferred sex [1].

The term “transsexualism” was used for the first time by Magnus Hirschfeld, a German doctor who referred the first Danish person for sex reassignment surgery (SRS) in 1930. However, it was the SRS in 1954 of U.S. soldier Christine Joergensen at the University Hospital of Copenhagen, Denmark, that delineated modern SRS using a combination of hormones and surgery [4]. This combination treatment prevails today.

Since the first SRS, several follow-up studies of individuals undergoing SRS have shown that the combination of hormones and SRS is an effective treatment and associated with many subsequent positive life changes, such as reduction in gender dysphoria and increased psychological well-being [4–10].

Cross-cultural research on transsexualism suggests country-specific variation in age at first requesting SRS as well as general differences in sociodemographic characteristics of male-to-female (MtF) vs. female-to-male (FtM) individuals. Studies from several European countries and one from Singapore investigating the age of requesting SRS show a variation between countries at what age the individuals are requesting SRS as well as a difference between MtF and FtM individuals. Overall, the studies show that in MtF individuals, the request is between the age of 25 and 37 years [9,11–22], while the FtM individuals are younger at their request, ranging from 20 to 30 years [11–13,23–25], for both groups with regional differences. This may reflect the individual differences but also different practices and legal issues in different countries.

In terms of marriage, relationships, and parenting, research suggests that individuals diagnosed with transsexualism at a group level have difficulties in establishing and maintaining marriage and intimate partnership [13,16,20,26,27]. Furthermore, marriage and parenting are significantly more common among MtF individuals as compared with FtM individuals. Having biological children ranges from under 2% [28] to 10% [26] in FtM populations and from zero [29] to 57% [30] in MtF populations [22,31,32]. FtM individuals have been found to more often live in a stable relationship with a same-sex partner as compared with MtF individuals [13,16,20,26,27]. Research on sexual orientation has shown that FtM compared with MtF significantly more often report sexual attraction to same assigned sex [11,12,18,20,22,24–26,28,30,33–35].

Regarding educational differences between the FtM and MtF populations, studies indicate that FtM individuals achieve a higher educational level as compared with MtF individuals [18]. For example, a Japanese study found that although only 1.6% of the general population of Japan did not attend school, 27% of FtM and 31% of MtF individuals did not attend school [36].

Individuals with transsexualism in general hold low employment status [16,20,28] and are often socially marginalized [16,37,38] with MtF populations generally experiencing higher rates of unemployment as compared with FtM individuals [16].

Critical limitations to existing research on transsexualism include small sample sizes, use of nonrepresentative transsexual samples, and/or limitations to the array of variables investigated [28,39,40]. In comparison, the cohort included in the current study comprises almost all Danish individuals with transsexualism who have received permission to undergo SRS during a period of 30 years. They were all diagnosed by a trained psychiatrist at the only Gender Identity Unit in Denmark, Sexological Clinic, University Hospital of Copenhagen (GIUUC). All participants had following sessions with psychiatrist and trained psychologist, psychological testing, and physical examination.

Accordingly, the present study seeks to extend current knowledge about characteristics of transsexualism related to onset age of gender identity problems, referral age, age at permission to undergo SRS, age at start of hormonal sex reassignment (SR), marriage, parenthood, sexual orientation, school, education, and employment by investigating differences between MtF and FtM individuals included. Assessing and understanding

the implication of such differences may be a key to developing appropriate and effective treatment and intervention strategies for this group.

Methods

Participants

The study is a follow-up study of the majority (98%) of individuals in Denmark, diagnosed with transsexualism, who in the period from 1978 to 2008 received permission from the Danish Health and Medicines Authority to undergo SRS, and all were included prior to SRS. Four of the 108 individuals did not make use of the permission to undergo SRS. Individuals were referred to GIUUC by GP, and all cost of the treatment were paid by the Danish health care system. In Denmark, all individuals with transsexualism who want SRS are referred to the GIUUC for assessment and clinical evaluation before they can apply for permission to undergo SRS. A diagnose of transsexualism is obligatory in order to be able to get permission for SRS.

The sample comprised 58 MtF (assigned males) and 50 FtM (assigned females) individuals. All participants were diagnosed with transsexualism by a psychiatrist according to ICD-8/ICD-10 criteria [1].

Procedure

The study was approved by The Danish Data Protection Agency and the Danish Health and Medicines Authority. Permission was obtained from The Civil Law Board to identify names and Social Security numbers of all individuals who had received permission to undergo SRS from 1978 to 2008 and who were treated at the GIUUC.

Data on family background, education, employment, partnership, sexual orientation, biological children, and process of SR were obtained from medical records. Medical record data were obtained based on interviews performed by a specialized psychiatrist, psychologist, and medical doctor at the GIUUC during the treatment period.

Measures

Sexual Orientation

Participants were divided into two groups. Group 1 consisted of participants who had sexual contacts with partners of the same assigned sex. Group 2 consisted of participants who had sexual contacts with partners of the opposite assigned sex or with

both opposite and same sex partners measured at referral and when they received permission for SRS [18,41].

Cohabitation

Cohabitation was measured at the time of permission to undergo SRS. Participants were divided into two groups based on length of cohabitation, with group 1 consisting of participants who had lived with a partner for 6 or more months and group 2 consisting of participants who lived with a partner less than 6 months or not at all.

Marital Status

The two groups for this comparison were based on official registration of marriage/same-sex partnership at the time of referral. Group 1 consisted of participants who were married, in a registered partnership, or widowed/widowed, and group 2 consisted of participants who were not married/same-sex partnership or who were divorced.

Biological Children

Participants were divided into two groups based on self-reported information about being a biological parent or not (groups 1 and 2, respectively). The data were collected at the time of permission to undergo SRS.

Age of Onset of Transsexualism

Participants were divided into two groups based on onset age of transsexualism. Group 1 consisted of participants with self-reported information of start of transsexualism before age 12, and group 2 consisted of participants with self-reported onset age later than age 12 [11,17,25,42,43].

Self-Initiated Hormone Treatment

Participants were divided into two groups based on how the participant self-reported prescription of cross-sex hormones. Group 1 consisted of participants who started treatment with cross-sex hormones on the participant's own initiative and not prescribed by GIUUC. Group 2 consisted of participants who started treatment with cross-sex hormones prescribed by GIUUC after evaluation.

Years in School

The measure of years in school was dichotomized; group 1 consisted of participants with 11 or fewer years of education (primary school), and group 2 consisted of participants with 12 or 13 years of education (high school) [44].

Further Education

Participants were divided into three groups based on level of education after primary or secondary

school. Group 1 consisted of participants with no education. Group 2 consisted of participants who had completed an apprenticeship or had up to 3 years of education. Group 3 consisted of participants who had 4 or more years of education [44].

Employment

For employment status, group 1 consisted of participants with a paid job or who had student status. Group 2 consisted of participants receiving sickness or unemployment benefits or who were receiving social welfare or were pensioners.

Statistics

The statistical analyses were conducted in SPSS version 19.0 (SPSS, IBM). The sociodemographic and clinical variables were analyzed using descriptive statistics. Means and standard deviations (SDs) were calculated for continuous variables, and frequencies and percentages were generated for nominal and categorical variables. Differences between the MtF and FtM populations were analyzed using the chi-squared (categorical data) or Student's *t*-test (continuous data).

Results

The mean age of the total sample at first referral was 28.7 years (SD 9.4; range 14–53). For MtF individuals, the mean age at referral was 30.2 years (SD 9.7) and for FtM individuals 26.9 years (SD 8.8). The participants had an average of 34 interviews (range 2–115) at GIUUC before they had permission to undergo SRS. The average number of years of evaluation and treatment from the first referral to permission to undergo SRS was 8.1 years for the MtF population and 5.9 years for the FtM group.

Tables 1 and 2 shows the results for the variables related to study aim 1: onset age, age at first referral, age at permission to undergo SRS, self-initiated cross-sex hormone treatment, sexual orientation, marriage, cohabitation, and parenthood. Significant differences between MtF and FtM were found in age at permission to undergo SRS, with MtF individuals being significantly older than FtM individuals ($P < 0.001$) and the FtM group being significantly younger at the age of onset of transsexualism than the MtF group ($P < 0.001$). Self-initiated hormonal SR was significantly more common in MtF individuals than in FtM individuals, with twice as many MtF participants starting cross-sex hormonal treatment on their own initiative ($P < 0.001$). A significant difference in sexual

orientation was found in the FtM individuals, which more often were gynephilic (attracted to females) both at the time of referral ($P < 0.01$) and at the time of permission to undergo SRS ($P < 0.001$). As seen from Table 2, MtF and FtM individuals did not differ in number of years of school, educational level, or employment status.

As the results may be influenced by changes of clinical procedures and guidelines over time as well as the cultural acceptance of transsexualism, data were checked for systematic differences between the first 15 years (1978–1993) and the next 15 years (1994–2008). No systematic differences were found.

Discussion

Using a unique sample of 98% of all Danish individuals who received permission to undergo SRS from 1978 to 2008, we found a significant difference in the FtM and MtF populations in terms of age at permission for SRS, with FtM individuals receiving permission on average 5 years earlier than MtF individuals. This result is in line with a majority of other previous studies, indicating that FtM persons seek treatment earlier than MtF [13,16,17,19–21,24].

We found a significant difference in the self-reported intake of cross-sex hormones, with twice as many MtF as FtM individuals initiating cross-sex hormonal SR on their own. This indicates that although MtF individuals seek professional treatment later, they are more inclined to start hormonal SR before consulting a gender unit as compared with FtM. This outcome likely explains why we found no difference in age when starting hormonal SR and suggests that the actual age when starting transformation to the opposite sex is similar for the MtF and FtM populations. As discussed by Gomez-Gil et al. [28] and Fischer et al. [32], the reason why MtF individuals start cross-sex hormone treatment on their own initiative may be that some MtF individuals have experienced difficulties, in some cases discrimination and stigma [45,46], in seeking medical help from gender units, but nonetheless felt intense discomfort with their assigned sex motivating them to start hormonal treatment on their own initiative. In this regard, data showed that the majority of self-initiated treatment with cross-sex hormones was prescribed by a GP or a private gynecologist.

Significantly more FtM than MtF participants had a sexual attraction to individuals of their

Table 1 Baseline demographics/sexual orientation/cross-sex hormones/parenthood for MtF and FtM individuals, n (%)

	MtF (n = 58)	FtM (n = 50)
Mean age at referral, years (SD)	30.2 (9.7)	26.9 (8.8)
Mean age at permission for SRS, years (SD)	37.4 (9.6)	32.6 (8.0)**
Mean age at initiating hormonal SR, years (SD)	32.0 (9.8)	29.9 (8.3)
Number of sessions at gender unit, n (%)		
1–30	30 (51.7)	23 (46.0)
31–60	21 (36.2)	23 (46.0)
>60	5 (8.6)	2 (4.0)
Unknown	2 (3.4)	2 (4.0)
Marriage, at referral, n (%)		
Yes	9 (15.5)	3 (6.0)
Widow	0	1 (2.0)
No	41 (70.7)	41 (82.0)
Divorced	8 (13.8)	5 (10.0)
Cohabitation >6 months, at permission for SRS, n (%)		
Yes	31 (53.4)	35 (70.0)
No	27 (46.6)	15 (30.0)
Attracted to one's own assigned sex orientation at referral, n (%)		
Yes	22 (37.9)	29 (58.0)*
No	35 (60.3)	21 (42.0)
Unknown	1 (1.7)	0
Attracted to one's own assigned sex at permission for SRS, n (%)		
Yes	26 (44.8)	43 (86.0)**
No	31 (53.4)	7 (14.0)
Unknown	1 (1.7)	0
Biological children at permission for SRS, n (%)		
Yes	13 (22.4)	5 (10.0)
No	45 (77.6)	44 (88.0)
Unknown	0	1 (2.0)
Onset age, n (%)		
Onset age < age 12	24 (41.4)	38 (76.0)**
Onset age > age 12	33 (56.9)	11 (22.0)
Unknown	1 (1.7)	1 (2.0)
Self-initiated hormone treatment, n (%)		
Yes	32 (55.2)	12 (24.0)**
Prescribed by GP/gynecologist	23 (39.7)	10 (20.0)
Brought via the Internet	2 (3.4)	1 (2.0)
Acquired through friends/family	7 (12.1)	1 (2.0)
No	22 (37.9)	37 (74.0)
Unknown	4 (6.9)	1 (2.0)

* $P < 0.01$; ** $P < 0.001$.

FtM = female-to-male; MtF = male-to-female; SRS = sex reassignment surgery.

assigned sex. We found that the number of both MtF and FtM participants reporting sexual attraction to individuals of their assigned sex increased from the time of first referral to the time of permission to undergo SRS. This finding corresponds with previous studies indicating that the MtF population may be more heterogeneous than the FtM population and the MtF individuals having a significant gynephilic orientation [10,12,18,20,22,24–26,28,30,33–35]. In this regard, we found that 60% of the MtF population was gynephilic, a relatively high number compared with other research, which may be attributed to the fact that we measured sexual orientation based on sexual behavior and not on sexual fantasies [18,41]. We found an increase in reported sexual attraction to individuals of their same assigned sex in both groups during treatment at GIUUC, indicating that sexual orientation may

change over time as noted by Lawrence [31]. This change is perhaps because of hormones, flexibility in sexual orientation caused by gender transitioning as noted by Daskalos [47], an effort to give socially desirable answers, and/or an overestimation by MtF individuals of androphilic attraction as indicated in studies from Italian and Spanish studies [28,32]. In this connection, it is important to acknowledge research suggesting that it may not be unusual for gynephilic MtF individuals to present themselves as being androphilic [32] to enhance their chances of SRS as suggested by Gomez-Gil et al. [28].

The sex ratio in our sample was 1.16:1 (MtF : FtM). This ratio is in line with recent findings from Norway [37] and Sweden [19,48] but in contrast to findings from Belgium [16,18], the Netherlands [12,49], Germany [19], and Spain

Table 2 Sociodemographics by MtF and FtM, n (%)

	MtF (n = 58)	FtM (n = 50)
Years of primary and secondary education		
≤11	40 (69.0)	38 (76.0)
12–13 (completion of high school)	16 (27.6)	12 (24.0)
Missing information	2 (3.4)	0
Further education beyond primary and secondary school at time of referral		
None	29 (50.0)	30 (60.0)
≤3 or having received an apprenticeship	21 (36.2)	8 (16.0)
4 years or more	5 (8.6)	10 (20.0)
Unknown	3 (5.2)	2 (4.0)
Further education beyond primary and secondary school at the time when permission for SRS was granted		
None	25 (43.1)	25 (50.0)
≤3 or having received an apprenticeship	21 (36.2)	13 (26.0)
4 years or more	8 (13.8)	10 (20.0)
Unknown	4 (6.9)	2 (4.0)
Employment at time of referral		
Employment	36 (62.1)	31 (62.0)
Unemployment		
Sickness or unemployment benefits	12 (20.7)	7 (14.0)
Social welfare/pensioners	10 (17.3)	12 (24.0)
Employment at the time when permission for SRS was granted		
Employment	32 (55.2)	27 (54.0)
Unemployment		
Sickness or unemployment benefits	5 (8.6)	11 (22.0)
Social welfare/pensioners	20 (34.5)	11 (22.0)
Unknown	1 (1.7)	1 (2.0)

FtM = female-to-male; MtF = male-to-female; SRS = sex reassignment surgery.

[17,28] where, in general, the sex ratio of MtF to FtM is three to one (3:1). Also, for comparison, in the only larger scale Danish study [35] from 1982 of 37 individuals with permission to undergo SRS, the sex ratio of MtF vs. FtM was 3.6:1. This indicates that over time, there has been a change in the ratio of individuals who had permission to undergo SRS with an increase in the number of assigned FtM in Denmark, and future studies will show if the same trend will appear in other countries. We have no reason to believe that there has been an accumulation of MtF cases in recent years and that this predominance has only recently been reduced. Due to the heterogeneity of the MtF individuals, one could speculate if there has been a restraint in permission to undergo SRS for MtF individuals. These MtF individuals may have been led into private treatment abroad [50]. The present study may also indicate that when it comes to permission to undergo SRS, the sexes are equal, which is in line with a the study by Landen et al. on a Swedish population [48]. Thus, gender differences in sex ratio in initial phases of treatment found in other studies may be attributed to heterogeneity in the MtF group [25,41,51,52].

Overall, about 50% of our study group had no education further than primary and secondary school. We do not have a control group, but in

the Danish population 15–69 years of age, the percentage of individuals with no education beyond primary and secondary school was about 34% in 2003 [53]. Previous studies [18,26,54] suggest that FtM individuals on average are better educated than MtF individuals. No such difference was found in the current study. Accordingly, we do not know if the MtF individuals in our study were better educated than in other studies or if the FtM individuals were less well educated than in other studies. We encourage future research to explore this potential discrepancy in research findings.

Individuals on social welfare and pensioners, and the unemployment rate (16–19%) in our study group were equally high in FtM and MtF individuals and were elevated compared with the Danish population in general, in which the unemployment rate in the period 1978–2008 ranged from 4% to 7% [55,56]. This elevated unemployment rate may be caused by lack of schooling and education level, and/or, as it has been found in other studies [28,32,38], because of the marginalization and social exclusion that these persons may suffer [28,32,38]. The employment rates for the population in the present study (54–62%) were lower than the employment rates found in Italian [32] (76%) and Spanish (83%) [28] samples of individu-

als with transsexualism but comparable with the MtF populations in Belgium (55%) [18] and Sweden (63–70%) [20].

The present rates of unemployment/social welfare/pensioners were high compared with other studies, which may indicate that the Danish welfare system is more supportive than systems in some other European countries, given the lack of evidence suggesting that individuals with transsexualism are more discriminated against in Denmark than in other countries [32,38]. During treatment for transsexualism, we saw an increase in early retirees that was not the result of age because the maximum age for participants in our study who had permission to undergo SRS was 56 years and the mean age for retirement in Denmark is 61.3 years. Additionally, unemployment rates increased, indicating that these persons' working ability decreased during treatment. The present study cannot explain these changes.

Contrary to previous studies [14,18,20,22,31] indicating that more MtF individuals had been engaged in marriage and parenthood, we found no significant difference in marriage or parenthood in the two groups. However, this may very likely be the result of low statistical power in our sample arising from the fact that very few individuals in our group in fact had been married (i.e., nine MtF vs. three FtM individuals). Alternatively, it may be that individuals diagnosed with transsexualism and approved for SRS during the investigated time period represent a selected group of individuals with transsexualism in which marriage and parenthood are relatively uncommon as seen in a study from Singapore [57].

The length of treatment for MtF and FtM (8.1 and 5.9 years, respectively) cannot be explained by the present study but may reflect different evaluation and clinical procedures over time. Conceptualization, evaluation, and treatment of individuals with GID have undergone substantial changes over the last 30 years, and the current scheduled length of treatment is aimed at being 1.5–2 years to permission for SRS moving more toward a "informed consent model." Another explanation may be that some individuals had several referrals to GIUUC before having permission for SRS, and the length of treatment was calculated from their first contact with the clinic.

The strength of this study lies in the unique cohort included. Thus, on a national basis and over a 30-year period, 98% of all individuals with transsexualism approved for SRS were included in this study. This gives unique insights into the

sociodemographic nature of this sample, core aspects of information related to treatment, and a unique position to assess differences between MtF and FtM on these variables.

The study does have some limitations. First, several of the items assessed were based on self-report and therefore perhaps not accurate [32]. Second, although we had a very large cohort for this type of study, still, some of our statistics and especially comparisons between MtF and FtM may suffer from low statistical power, thus increasing the changes for type II errors. Third, we are unsure how/if the results may generalize to individuals with transsexualism not attending a public clinic specializing in gender identity disorders.

Despite these limitations, the present study reports the sociodemographic and clinical characteristics of a unique cohort of 108 Danish individuals with transsexualism. It provides different profiles for the MtF and FtM populations and suggests differences in age at onset and permission to undergo SRS, sexual orientation toward own assigned sex, and self-initiated hormonal SRS. This information is important for facilitating attention to and understanding and choice of appropriate treatments and interventions for individuals diagnosed with transsexualism. Providing easier access for MtF individuals to receive cross-sex hormonal SR could avoid intake of cross-sex hormones before psychiatric and psychological evaluation at GIUUC and the possible resulting dangerous and negative side effects. Our research reveals that 76.0% of FtM and 41.4% of MtF individuals who later had permission to undergo SRS had an onset age of transsexualism before 12 years, indicating a need for advisory and treatment facilities for children and adolescents. The average time of treatment from first referral to permission for SRS was 7 years, which seems a long time period compared with recommendations from the World Professional Association for Transgender Health [3] but does not reflect the practice at the GIUUC today. Issues related to school, education, and employment status may require attention by political and/or health personnel in order to provide adequate help and possibilities to alleviate problems related to these core areas of life.

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References

- 1 WHO collaborating Centre for Research and Training in Mental Health. WHO ICD-10. 1995.
- 2 Lobato IM, Koff WJ, Schestatsky SS, Chaves C, Petry A. Clinical characteristics, psychiatric comorbidities and sociodemographic profile of transsexual patients from an outpatient clinic in Brazil. 2 ed. *Int J Transgenderism* 2007;10:69–77.
- 3 The World Professional Association for Transgender Health. Standards of Care. WPATH; 2011.
- 4 Roberto LG. Issues in diagnosis and treatment of transsexualism. *Arch Sex Behav* 1983;12:445–73.
- 5 Krege S, Bex A, Lummen G, Rubben H. Male-to-female transsexualism: A technique, results and long-term follow-up in 66 patients. *BJU Int* 2001;88:396–402.
- 6 Lobato MI, Koff WJ, Manenti C, da Fonseca SD, Salvador J, da Graca Borges FM, Petry AR, Silveira E, Henriques AA. Follow-up of sex reassignment surgery in transsexuals: A Brazilian cohort. *Arch Sex Behav* 2006;35:711–5.
- 7 Michel A, Anseau M, Legros JJ, Pitchot W, Mormont C. The transsexual: What about the future? *Eur Psychiatry* 2002;17:353–62.
- 8 Murad MH, Elamin MB, Garcia MZ, Mullan RJ, Murad A, Erwin PJ, Montori VM. Hormonal therapy and sex reassignment: A systematic review and meta-analysis of quality of life and psychosocial outcomes. *Clin Endocrinol (Oxf)* 2010;72:214–31.
- 9 Rakic Z, Starcevic V, Maric J, Kelin K. The outcome of sex reassignment surgery in Belgrade: 32 patients of both sexes. *Arch Sex Behav* 1996;25:515–25.
- 10 Smith YL, van Goozen SH, Kuiper AJ, Cohen-Kettenis PT. Sex reassignment: Outcomes and predictors of treatment for adolescent and adult transsexuals. *Psychol Med* 2005;35:89–99.
- 11 Smith YL, van Goozen SH, Kuiper AJ, Cohen-Kettenis PT. Transsexual subtypes: Clinical and theoretical significance. *Psychiatry Res* 2005;137:151–60.
- 12 Verschoor AM, Poortinga J. Psychosocial differences between Dutch male and female transsexuals. *Arch Sex Behav* 1988;17:173–8.
- 13 van Kesteren PJ, Gooren LJ, Megens JA. An epidemiological and demographic study of transsexuals in The Netherlands. *Arch Sex Behav* 1996;25:589–600.
- 14 Herman-Jeglinska A, Grabowska A, Dulko S. Masculinity, femininity, and transsexualism. *Arch Sex Behav* 2002;31:527–34.
- 15 Tsoi WF. Male and female transsexuals: A comparison. *Singapore Med J* 1992;33:182–5.
- 16 De Cuypere G, Van HM, Michel A, Carael B, Heylens G, Rubens R, Hoebeke P, Monstrey S. Prevalence and demography of transsexualism in Belgium. *Eur Psychiatry* 2007;22:137–41.
- 17 Weitze C, Osburg S. Transsexualism in Germany: Empirical data on epidemiology and application of the German Transsexuals' Act during its first ten years. *Arch Sex Behav* 1996;25:409–25.
- 18 De Cuypere G, Janes C, Rubens R. Psychosocial functioning of transsexuals in Belgium. *Acta Psychiatr Scand* 1995;91:180–4.
- 19 Dhejne C, Lichtenstein P, Boman M, Johansson AL, Langstrom N, Landen M. Long-term follow-up of transsexual persons undergoing sex reassignment surgery: Cohort study in Sweden. *PLoS ONE* 2011;6:e16885.
- 20 Landen M, Walinder J, Lundstrom B. Clinical characteristics of a total cohort of female and male applicants for sex reassignment: A descriptive study. *Acta Psychiatr Scand* 1998;97:189–94.
- 21 Olsson SE, Moller AR. On the incidence and sex ratio of transsexualism in Sweden, 1972–2002. *Arch Sex Behav* 2003;32:381–6.
- 22 Okabe N, Sato T, Matsumoto Y, Ido Y, Terada S, Kuroda S. Clinical characteristics of patients with gender identity disorder at a Japanese gender identity disorder clinic. *Psychiatry Res* 2008;157:315–8.
- 23 Esteve de Antonio I, Giraldo F, Bergero de Miguel T, Cano Oncala G, Crespillo Gomez C, Ruiz de Adana S. Evaluacion endocrinologia y tratamiento hormonal de la transexualidad en la Unidad de Trastornos de Identidad de Genero en Andalucia (Malaga). 2001.
- 24 Kockott G, Fahrner EM. Male-to-female and female-to-male transsexuals: A comparison. *Arch Sex Behav* 1988;17:539–46.
- 25 Burns A, Farrell M, Brown JC. Clinical features of patients attending a gender-identity clinic. *Br J Psychiatry* 1990;157:265–8.
- 26 Dixen JM, Maddever H, Van MJ, Edwards PW. Psychosocial characteristics of applicants evaluated for surgical gender reassignment. *Arch Sex Behav* 1984;13:269–76.
- 27 Gomez-Gil E, Zubiaurre-Elorza L, Esteve de Antonio I, Guillamon A, Salamero M. Determinants of quality of life in Spanish transsexuals attending a gender unit before genital sex reassignment surgery. *Qual Life Res* 2014;23:669–76.
- 28 Gomez-Gil E, Trilla A, Salamero M, Godas T, Valdes M. Sociodemographic, clinical, and psychiatric characteristics of transsexuals from Spain. *Arch Sex Behav* 2009;38:378–92.
- 29 Tsoi WF, Kok LP, Long FY. Male transsexualism in Singapore: A description of 56 cases. *Br J Psychiatry* 1977;131:405–9.
- 30 Lawrence AA. Sexual orientation versus age of onset as bases for typologies (subtypes) for gender identity disorder in adolescents and adults. *Arch Sex Behav* 2010;39:514–45.
- 31 Lawrence AA. Sexuality before and after male-to-female sex reassignment surgery. *Arch Sex Behav* 2005;34:147–66.
- 32 Fischer A, Bandini E, Casale H, Ferruccio N, Meriggola M. Sociodemographic and clinical features of gender identity disorder: An Italian multicentric evaluation. *J Sex Med* 2013;10:408–19.
- 33 Blanchard R, Clemmensen LH, Steiner BW. Heterosexual and homosexual gender dysphoria. *Arch Sex Behav* 1987;16:139–52.
- 34 Hoening J, Kenna J, Youd A. Social and economic aspects of transsexualism. *Br J Psychiatry* 1970;117:163–72.
- 35 Sorensen T, Hertoft P. Male and female transsexualism: The Danish experience with 37 patients. *Arch Sex Behav* 1982;11:133–55.
- 36 Terada S, Matsumoto Y, Sato T, Okabe N, Kishimoto Y, Uchitomi Y. School refusal by patients with gender identity disorder. *Gen Hosp Psychiatry* 2012;34:299–303.
- 37 Kreukels BP, Haraldsen IR, De Cuypere G, Richter-Appelt H, Gijs L, Cohen-Kettenis PT. A European network for the investigation of gender incongruence: The ENIGI initiative. *Eur Psychiatry* 2012;27:445–50.
- 38 European Union Agency for Fundamental Rights. European Union lesbian, gay, bisexual and transgender survey. EU publishing office; 2013.
- 39 Cohen-Kettenis PT, Gooren LJ. Transsexualism: A review of etiology, diagnosis and treatment. *J Psychosom Res* 1999;46:315–33.
- 40 Cohen-Kettenis PT, Pfafflin F. The DSM diagnostic criteria for gender identity disorder in adolescents and adults. *Arch Sex Behav* 2010;39:499–513.
- 41 Blanchard R. Early history of the concept of autogynephilia. *Arch Sex Behav* 2005;34:439–46.
- 42 Doorn CD, Poortinga J, Verschoor AM. Cross-gender identity in transvestites and male transsexuals. *Arch Sex Behav* 1994;23:185–201.
- 43 O'Gorman E. A Retrospective Study of Epidemiological and Clinical Aspects of 28 Transsexual Patients. 11 ed. 1982.

- 44 <http://www.eng.uvm.dk>. Overview of the Danish Education System. 2014. Available at: <http://eng.uvm.dk/Education/Adult-Education-and-Continuing-Training> (accessed July 11, 2014).
- 45 Poteat T, German D, Kerrigan D. Managing uncertainty: A grounded theory of stigma in transgender health care encounters. *Soc Sci Med* 2013;84:22–9.
- 46 Melendez RM, Pinto R. “It’s really a hard life”: Love, gender and HIV risk among male-to-female transgender persons. *Cult Health Sex* 2007;9:233–45.
- 47 Daskalos CT. Changes in the sexual orientation of six heterosexual male-to-female transsexuals. *Arch Sex Behav* 1998;27:605–14.
- 48 Landen M, Walinder J, Lundstrom B. Prevalence, incidence and sex ratio of transsexualism. *Acta Psychiatr Scand* 1996;93:221–3.
- 49 Bakker A, van Kesteren PJ, Gooren LJ, Bezemer PD. The prevalence of transsexualism in The Netherlands. *Acta Psychiatr Scand* 1993;87:237–8.
- 50 Bodlund O, Kullgren G, Sundbom E, Hojerback T. Personality traits and disorders among transsexuals. *Acta Psychiatr Scand* 1993;88:322–7.
- 51 Person E, Ovesey L. The transsexual syndrome in males 1. Primary transsexualism. 1 ed. *Am J Psychother* 1974;28:4–20.
- 52 Person E, Ovesey L. The transsexual syndrome in males 2. Secondary transsexualism. 2 ed. *Am J Psychother* 1974;28:174–93.
- 53 Klaus Fribert Jacobsen. *Befolkningens uddannelsesniveau*. Danmarks Statistiks Forlag; 2004.
- 54 Vujovic S, Popovic S, Sbutega-Milosevic G, Djordjevic M, Gooren L. Transsexualism in Serbia: A twenty-year follow-up study. *J Sex Med* 2009;6:1018–23.
- 55 Statistics Denmark. Registered Unemployment. 2014. Available at: <http://www.dst.dk/da/Statistik/emner/arbejdsloshed/registreret-ledighed.aspx> (accessed June 15, 2014).
- 56 Undervisningsministeriet. Den aktuelle ledighed og beskæftigelse. 2014. Available at: http://www.ug.dk/job/artikleromjobogarbml/ledighedsstatistik/den_aktuelle_ledighed_og_beskaeftigelse.aspx (accessed June 15, 2014).
- 57 Tsoi WF. Developmental profile of 200 male and 100 female transsexuals in Singapore. *Arch Sex Behav* 1990;19:595–605.