Mental health and gender dysphoria: A review of the literature

Cecilia Dhejne, Roy Van Vlerken, Gunter Heylens & Jon Arcelus

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ABSTRACT
Studies investigating the prevalence of psychiatric disorders among trans individuals have identified elevated rates of psychopathology. Research has also provided conflicting psychiatric outcomes following gender-confirming medical interventions. This review identifies 38 cross-sectional and longitudinal studies describing prevalence rates of psychiatric disorders and psychiatric outcomes, pre- and post-gender-confirming medical interventions, for people with gender dysphoria. It indicates that, although the levels of psychopathology and psychiatric disorders in trans people attending services at the time of assessment are higher than in the cis population, they do improve following gender-confirming medical intervention, in many cases reaching normative values. The main Axis I psychiatric disorders were found to be depression and anxiety disorder. Other major psychiatric disorders, such as schizophrenia and bipolar disorder, were rare and were no more prevalent than in the general population. There was conflicting evidence regarding gender differences: some studies found higher psychopathology in trans women, while others found no differences between gender groups. Although many studies were methodologically weak, and included people at different stages of transition within the same cohort of patients, overall this review indicates that trans people attending transgender health-care services appear to have a higher risk of psychiatric morbidity (that improves following treatment), and thus confirms the vulnerability of this population.

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Gender dysphoria; transsexualism; mental health; psychiatric disorders; depression; anxiety

Introduction
The Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People, version 7 (SOC-7) by the World Professional Association for Transgender Health (WPATH), provides clinical guidance in ‘how to assist transsexual, transgender, and gender nonconforming people with safe and effective pathways to achieving lasting personal comfort with their gendered selves, in order to maximize their overall health, psychological well-being, and self-fulfilment. This assistance may include primary care, gynaecological and urological care, reproductive options, voice and communication therapy, mental health services (e.g. assessment, counselling, psychotherapy), and hormonal and surgical treatments’ (Coleman et al., 2012). SOC-7 argues that the mental health professional should work within a multi-disciplinary team or in close contact with other gender specialists. The main roles of mental health professionals within gender care have been described as:

1. To facilitate the diagnosis of gender dysphoria
2. To assess for psychiatric co-morbidity
3. To explore the readiness for gender-confirming medical intervention (Coleman et al., 2012).
4. To support the trans person through the health pathway (Lev, 2009).

Although some professionals in the field have described the involvement of a mental health professional in the care of trans people as a responsible form of care (Selvaggi & Giordano, 2014), it could be argued that this is the direct result of transsexualism or gender dysphoria being considered a psychiatric diagnosis. The placement of the diagnoses (either gender dysphoria or transsexualism) within the Diagnostic and Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 2013), and within the Mental and Behavioural Disorders chapter of the International Classification of Diseases and Health Related Problems (World Health Organization, 1992), has been subject to continuing debate. The first appearance of these diagnoses in the aforementioned publications (using different
terms) may be related to the social and medical attitudes at the time when Harry Benjamin started to describe and treat trans people (Drescher et al., 2012). Whether incongruence with one’s gender is a natural variation or a pathology, and how this view may influence discrimination, stigma and access to medical treatment, is well discussed in a paper by Meyer-Bahlburg (2010).

The WHO’s proposal for the next edition of the ICD (ICD-11) is to replace the current diagnostic term ‘transsexualism’ with ‘gender incongruence’, and to move this diagnosis from chapter 5 to a new chapter entitled ‘Conditions related to sexual health’ (Drescher et al., 2012). This will support the view of many that a diagnosis describing trans people should not be part of a psychiatric category (Richards et al., 2015). This could help to remove some of the stigma which trans people currently encounter. However, by doing so, it also raises questions concerning the future role, if any, of mental health professionals in transgender care.

One of the roles may be connected to the high prevalence of psychiatric morbidity among trans people described in the literature (Gomez-Gil et al., 2009; Hepp et al., 2005; Heylens et al., 2014a; Mazaheri Meybodi et al., 2014a), which may require assessment and management by a mental health professional. The literature in this area is confusing, as different prevalence rates of psychiatric co-morbidity have been described.

With this in mind, this paper has two aims:

1. To review the available literature that looks at the prevalence of psychiatric disorders and psychopathology among trans people
2. To review the available literature describing the psychiatric outcome following gender-confirming medical interventions (GCMI), either cross-sex hormone treatment (CHT) and/or gender-confirming genital surgery (GCGS)

As the terminology in this field has changed over the years, the term ‘trans people’ will be used in this review to refer to individuals with gender dysphoria attending transgender health-care services and, in most cases, seeking gender-confirming medical interventions.

**Methodology**

**Eligibility criteria**

Studies were selected only if participants were diagnosed by health professionals, and/or had been accepted for gender-confirming interventions, and had empirical data relating to the prevalence of psychiatric morbidity or psychopathology pre- or post-treatment. Articles dealing exclusively with self-harm (non-suicidal self-injury), suicidality, autism, eating disorders or individuals under 18 years old were not included, as they are part of other reviews within this special edition. Only studies in English and with more than 10 participants were selected.

**Information sources and search**

An electronic literature search was conducted between January 2000 and April 2015 using PubMed. Articles in the *International Journal of Transgenderism* (not in PubMed) were also included, in order to identify more studies. Additionally, reference sections of identified articles were also examined for further relevant publications. The search used the following words in the title and/or abstract.

1. For terms referring to trans people: transsexualism, transsexual, transgender, gender dysphoria, gender identity disorder, trans*
2. For psychiatric disorders and psychopathology: mental health, psychopathology, psychiatric, depression, anxiety

Every term used for trans people was combined using the ‘or’ and the ‘and’ operator with every term used for psychiatric disorders and psychopathology.

**Study selection**

A total of 647 studies were identified. By the screening of titles and abstracts, 47 studies fulfilled the eligibility criteria and were selected for more in-depth analysis. Out of these 47 studies, nine were excluded because they did not provide data regarding psychiatric disorders or psychopathology, but focused primarily on quality of life or sexual health, thus a total of 38 studies were selected for this review. Data extraction was performed using a standardized table with the following categories: title, authors, date of publication, participants, age at assessment, study design, diagnostic criteria used, control group, measurements related to psychiatric disorder and/or psychopathology, prevalence rates of psychiatric disorders, and conclusions of the study. For those papers investigating outcome, information regarding follow-up was also included, as well as the outcome on psychopathology and/or psychiatric disorders. The data is summarized in two tables: Table 1 shows cross-sectional studies describing prevalence rates of psychiatric disorders and/or psychopathology in trans people (27 studies). This table includes trans people at different stages of treatment. Table 2 shows longitudinal studies describing psychiatric outcome of post gender-confirming medical interventions (11 studies).
## Table 1. Cross-sectional studies investigating psychiatric disorders and psychopathology in trans people.

<table>
<thead>
<tr>
<th>Authors (year)</th>
<th>Country</th>
<th>Number of trans participants/diagnosis/mean age at assessment</th>
<th>Treatment status: (on CHT or post-GCGS)</th>
<th>Study design</th>
<th>Comparative groups</th>
<th>Outcome measure</th>
<th>Prevalence in trans</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haraldsen &amp; Dahl (2000)</td>
<td>Norway</td>
<td>35 FtM 51 MtF DSM-III-R DSM-IV 34.0 years FtM 33.3 years MtF</td>
<td>CHT NR GCGS Mixed pre- and post-surgery</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>CC 1068 Personality disorder (PD) 101</td>
<td>SCID-I SCID-II GAF SCL-90R</td>
<td>Axis 1 disorders (mostly depression and anxiety) 32.5% Axis 2 disorders 19.8% SCL-90R as per CC</td>
</tr>
<tr>
<td>Miach et al. (2000)</td>
<td>Australia</td>
<td>82 MtF: 48 GID 34 GIDAANT DSM-III-R DSM-IV 33.5 years</td>
<td>CHT NR GCGS 0%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>GID vs GIDAANT MMPI-2</td>
<td></td>
<td>Psycho-pathology: Low in 85% of GID High in 47% of GIDAANT</td>
</tr>
<tr>
<td>Kersting et al. (2003)</td>
<td>Germany</td>
<td>12 FtM 29 MtF DSM-IV 34.7 years</td>
<td>CHT NR GCGS 17%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>Psychiatric inpatients 115 Normative data</td>
<td>DES SCID-D</td>
<td>Dissociative symptoms: Trans similar to psychiatric inpatients</td>
</tr>
<tr>
<td>Hepp et al. (2005)</td>
<td>Switzerland</td>
<td>11 FtM 20 MtF DSM-IV 33.2 years</td>
<td>CHT 32% GCGS 23%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>SCID-I SCID-II HADS</td>
<td>Axis I disorder current (mostly anxiety) 38.7% Axis I disorder, lifetime (mostly mood disorder and substance abuse) 71% Axis II disorder 41.9%</td>
</tr>
<tr>
<td>Kim et al. (2006)</td>
<td>Korea</td>
<td>43 MtF DSM-IV 20.4 years</td>
<td>CHT 88% GCGS 26%</td>
<td>Single centre (Identified as part of the military service examination with gender dysphoria)</td>
<td>Cross-sectional</td>
<td>Cs men 47 Matched for age and education</td>
<td>BDI SADS SES</td>
<td></td>
</tr>
<tr>
<td>Gomez-Gil et al. (2008)*</td>
<td>Spain</td>
<td>56 FtM 107 MtF DSM-IV 27.3 years FtM 29.9 years MtF</td>
<td>CHT NR GCGS 0%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>Normative data</td>
<td>MMPI-2</td>
<td>MMPI: Within normal range</td>
</tr>
<tr>
<td>Gomez-Gil et al. (2009)*</td>
<td>Spain</td>
<td>159 MtF 71 FtM DSM-IV-TR ICD-10 27.3 years FtM 29.7 years MtF</td>
<td>CHT 49% GCGS 0%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>MINI</td>
<td>Psychiatric disorders Life time: Mood and adjustment disorders 56% (MtF) and 70.4% (FtM) Non-alcohol substance abuse/dependence 30.2% (MtF) Generalized anxiety disorder 8.8% (MtF) and 5.6% (FtM) Current: Social phobia 8.2% (MtF) and 11.3% (FtM)</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Authors (year)</th>
<th>Country</th>
<th>Number of trans participants/diagnosis/mean age at assessment</th>
<th>Treatment status: (on CHT or post-GCGS)</th>
<th>Study design</th>
<th>Comparative groups</th>
<th>Outcome measure</th>
<th>Outcome</th>
<th>Prevalence in trans</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madeedu et al. (2009)</td>
<td>Italy</td>
<td>34 MtF 16 FtM DSM-IV-TR31.7 years</td>
<td>CHT 36% GCGS 0%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>SCID-II</td>
<td>Axis II disorders 52%</td>
<td>No Axis II differences between genders</td>
</tr>
<tr>
<td>Weyers et al. (2009)</td>
<td>Belgium</td>
<td>50 MtF ICD-10 43.06 years</td>
<td>CHT 100% GCGS 100%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>Normative data</td>
<td>SF-36</td>
<td>Mental health problems: No difference to normative data</td>
<td>Less Psychopathology if in a relationship</td>
</tr>
<tr>
<td>Hoshiai et al. (2010)</td>
<td>Japan</td>
<td>349 FtM 230 MtF DSM-IV 26.5 years FtM 32.0 years MtF</td>
<td>CHT 32% GCGS 12%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>Clinical interview and clinical records</td>
<td>Axis I disorder 13.6%</td>
<td>Adjustment disorder 6.7% Anxiety disorder 3.6% Mood disorder 1.4%</td>
</tr>
<tr>
<td>Bandini et al. (2011)</td>
<td>Italy</td>
<td>109 MtF DSM-IV-TR 36.0 years</td>
<td>CHT 70.6% GCGS 25.7%</td>
<td>Single centre (Gender clinics)</td>
<td>Cross-sectional</td>
<td>Trans with and without childhood maltreatment (CM)</td>
<td>Psychiatric disorder (life time): 66.7% (CM) 37.2% (non-CM) SCL-90R: no difference between groups When compared to 1973-2003 controls: Mortality 2.8 HRadj Any psychiatry diagnoses: 2.8 HRadj Suicide attempts: 4.9 HRadj When compared 1989-2003 to controls: Mortality the same. Any psychiatry diagnoses: 2.8 HRadj Suicide attempts: the same</td>
<td>CM group higher body dissatisfaction and worse life time mental health</td>
<td></td>
</tr>
<tr>
<td>Dhejne et al. (2011)</td>
<td>Sweden</td>
<td>191 MtF 133 FtM ICD-8,-9,-10 33.3 years FtM 36.3 years MtF</td>
<td>CHT NR GCGS 100%</td>
<td>Multi centre (National register)</td>
<td>Cross-sectional</td>
<td>CC 3240 matched for age, natal and new assigned gender</td>
<td>Psychiatric morbid-ity and abuse</td>
<td>Psychiatric disorder: 66.7% (CM) 37.2% (non-CM) SCL-90R: no difference between groups When compared to 1973-2003 controls: Mortality 2.8 HRadj Any psychiatry diagnoses: 2.8 HRadj Suicide attempts: 4.9 HRadj When compared 1989-2003 to controls: Mortality the same. Any psychiatry diagnoses: 2.8 HRadj Suicide attempts: the same</td>
<td>Gender: no difference, natal or assigned gender Female or male control group: No difference</td>
</tr>
<tr>
<td>Simon et al. (2011)</td>
<td>Hungary</td>
<td>30 MtF 17 FtM DSM-V 28.0 years FtM 26.0 years MtF</td>
<td>CHT NR GCGS 0%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>CC= 157</td>
<td>SCL-90R</td>
<td>Psychopathology: SCL-90R: No differences compared to controls</td>
<td>MtF elevated levels of interpersonal sensitivity</td>
</tr>
<tr>
<td>Gomez-Gil et al. (2012)</td>
<td>Spain</td>
<td>74 FtM 113 MtF ICD-10 DSM-IV-TR 29.7 years</td>
<td>CHT 35.8% GCGS 42.2%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>Trans with and without treatment Normative data</td>
<td>SADS HADS A-HADD</td>
<td>Social anxiety, depression and anxiety: SADS, HADS scores normal range except for HAD-A Differences CHT or not: CHT group lower scores Depression: 25% significant scores in the BDI</td>
<td>Gender: No difference CHT: CHT group better when compared to not treated Limitation: Pre-/post groups were not the same Gender: no difference</td>
</tr>
<tr>
<td>Gorin-Lazard et al. (2012)</td>
<td>France</td>
<td>30 FtM 31 MtF DSM-IV-TR 29.9 years FtM 39.4 years MtF</td>
<td>CHT 72.1% GCGS NR</td>
<td>Multi centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>BDI</td>
<td>Psychopathology: SCL-90R: No differences compared to controls</td>
<td>Gender: No difference CHT: CHT group better when compared to not treated Limitation: Pre-/post groups were not the same Gender: no difference</td>
</tr>
<tr>
<td>Auer et al. (2013)</td>
<td>Germany</td>
<td>32 FtM 57 MtF ICD-10</td>
<td>CHT 100% GCGS 65%</td>
<td>Single centre (Endocrinology clinic)</td>
<td>Cross-sectional</td>
<td>CC 336 age and sex (natal and phenotype) matched</td>
<td>SCL-90R</td>
<td>Psychopathology: SCL-90R: No differences compared to controls</td>
<td>Gender: No difference CHT: CHT group better when compared to not treated Limitation: Pre-/post groups were not the same Gender: no difference</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Authors (year)</th>
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<th>Treatment status: (on CHT or post-GCGS)</th>
<th>Study design</th>
<th>Comparative groups</th>
<th>Outcome measure</th>
<th>Prevalence in trans</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fisher et al. (2013)</td>
<td>Italy</td>
<td>32.3 years FtM 47.9 years MtF</td>
<td>CHT 69.8% GCGS</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>SCID-I-II</td>
<td>Axis I disorders 18.7% Mood and adjustment disorder 10.8% Anxiety disorder 5% Axis II disorders 4.3%</td>
</tr>
<tr>
<td>Gorin-Lazard et al. (2013)</td>
<td>France</td>
<td>36 MtF 31 MtF</td>
<td>CHT 73.1% GCGS NR</td>
<td>Multi-centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>Trans with and without CHT</td>
<td>BDI SSEQI</td>
<td>Depression and self-esteem: Trans on CHT less depressive symptoms, better self esteem</td>
</tr>
<tr>
<td>Davey et al. (2014)</td>
<td>UK</td>
<td>63 MtF 40 FtM</td>
<td>CHT 78.6% GCGS 16.5%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>CC 103 Controlled by age</td>
<td>SCL-90R</td>
<td>Psychopathology: SCL-90R scores higher in trans</td>
</tr>
<tr>
<td>Duisin et al. (2014)</td>
<td>Serbia</td>
<td>21 MtF 9 FtM</td>
<td>CHT NR GCGS 0%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>CC 30</td>
<td>SCID-II</td>
<td>Axis-II diagnosis 66.6% (most frequent paranoid and avoidant)</td>
</tr>
<tr>
<td>Fisher et al. (2014)</td>
<td>Italy</td>
<td>59 FtM 66 MtF</td>
<td>CHT 0% GCGS NR</td>
<td>Multi-centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>Trans with and without CHT</td>
<td>SCL-90R BUT GSI</td>
<td>Psychopathology: No difference between both on SCL-90R BUT GSI: MtF with CHT group had less body uneasiness than not treated group</td>
</tr>
<tr>
<td>Judge et al. (2014)</td>
<td>Ireland</td>
<td>159 MtF 59 FtM</td>
<td>CHT 20.2% GCGS 1.6%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>Psychiatric assessment by mental health professional</td>
<td>Depression (lifetime) 34.4% Schizophrenia 3.67% Bipolar disorder 2.29%</td>
</tr>
<tr>
<td>Heylens et al. (2014a)</td>
<td>Belgium, Germany, Netherlands, Norway</td>
<td>182 MtF 123 FtM 22.8-31.2 years FtM 33.1-36 years MtF</td>
<td>CHT 0% GCGS 0%</td>
<td>Multicentre 4 countries</td>
<td>Cross-sectional</td>
<td>No</td>
<td>MINI SCID-II</td>
<td>Axis I diagnosis (current) 38% Affective problems 27% Anxiety problems 17% Axis I (current and lifetime) 70% Affective problems 60% Anxiety problems 28%Axis II diagnosis 15%</td>
</tr>
<tr>
<td>Mazaheri Meybodi et al. (2014a)</td>
<td>Iran</td>
<td>47 MtF 36 FtM</td>
<td>CHT 92.9% GCGS 0%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>SCID-I</td>
<td>Axis-I diagnosis 62.7% Major depressive disorder (33.7%) Specific phobia (20.5%) Adjustment disorder (15.7%)</td>
</tr>
<tr>
<td>Mazaheri Meybodi et al. (2014b)</td>
<td>Iran</td>
<td>39 MtF 31 FtM</td>
<td>CHT 92.9% GCGS 0%</td>
<td>Single centre (Gender clinic)</td>
<td>Cross-sectional</td>
<td>No</td>
<td>MCMI-II</td>
<td>Axis II diagnosis 81.4% (57.1% narcissistic)</td>
</tr>
<tr>
<td>Claes et al. (2015)</td>
<td>UK</td>
<td>103 MtF 52 FtM</td>
<td>CHT 0% GCGS 0%</td>
<td>No</td>
<td>SCL-90R RSE</td>
<td>Psychopathology: MIF reported significantly higher scores</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cross-sectional studies

The 27 studies were all conducted in different transgender health-care services or gender identity clinic services, using data collected as part of the assessment (whether prospectively or retrospectively). The diagnosis was made according to DSM criteria (ranging from DSM-III-R to DSM-5) (American Psychiatric Association, 1987, 1994, 2000, 2013) and, in six studies, according to the ICD-10 (World Health Organization, 1992). The remainder of the studies included people at different stages of treatment for gender dysphoria, or the treatment status was unknown or not reported. Only five studies were multi-centred and, with the exception of one (Kim et al., 2006), participants were all recruited through transgender health-care services.

The studies concluded that the prevalence of psychiatric co-morbidity and psychopathology was high. However, only seven studies used a control group, and only four of them matched the cis controls with the trans population studied for factors known to affect psychopathology (such as age). Most studies used normative data to reach a conclusion as to whether the prevalence found was high or not. The most commonly used measurement to assess for psychiatric disorders was the Structured Clinical Interview for DSM (SCID) (First et al., 2002), and for psychopathology, the Symptom Checklist -90 (SCL-90) (Derogatis et al., 2010). For more details, please see Table 1.

Longitudinal studies

The 11 longitudinal studies evaluate changes in psychiatric disorders and/or psychopathology following gender-confirmed medical interventions. Nine studies following cross-sex hormonal therapy and two following gender-confirming genital surgery. Six of the studies also provide cross-sectional data pretreatment compared with normative values. The information regarding follow-up time was recorded in all of the studies and ranged from six months (Udeze et al., 2008) to 13.3 years (Ruppin & Pfafflin, 2015). Lost to follow-up ranged from 0% (Colizzi et al., 2013, 2014) in 49.3% (Ruppin & Pfafflin, 2015). For more information about these studies, see Table 2.
Table 2. Follow up studies investigating outcome of psychiatric disorders and psychopathology post gender treatment in trans people.

<table>
<thead>
<tr>
<th>Authors (year)</th>
<th>Country</th>
<th>Number of trans participants/ diagnosis/ mean age at assessment</th>
<th>Treatment status: (on CHT or post GCGS)</th>
<th>Study design</th>
<th>Comparative groups</th>
<th>Length of follow-up post-treatment</th>
<th>Lost to follow-up</th>
<th>Outcome measure</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slabbekoorn et al. (2001)</td>
<td>Netherlands</td>
<td>47 FtM 54 MtF DSM-III-R 25.7 years FtM 32.9 years MtF</td>
<td>CHT 100% GCGS 0%</td>
<td>Single centre (Gender Clinic)</td>
<td>Prospective</td>
<td>Pre-vs post-CHT</td>
<td>14 weeks post-CHT</td>
<td>0</td>
<td>AIM SAQ</td>
</tr>
<tr>
<td>Smith et al. (2001)</td>
<td>Netherlands</td>
<td>13 FtM 7 MtF DSM-III-R 16.6 years</td>
<td>CHT 100% GCGS 100%</td>
<td>Single centre (Gender clinic)</td>
<td>Prospective</td>
<td>Pre-vs post-GCGS Control; 21 patients who have been denied/ declined GCGS</td>
<td>1–4 years post-GCGS 1–7 years controls</td>
<td>17%</td>
<td>Dutch Short MMPI SCL-90</td>
</tr>
<tr>
<td>Smith et al. (2005)</td>
<td>Netherlands</td>
<td>71 FtM 117 MtF DSM-IV 29.6y FtM 38.6y MtF</td>
<td>CHT 100% GCGS 100%</td>
<td>Single centre (Gender clinic)</td>
<td>Prospective</td>
<td>Pre-vs post-GCGS</td>
<td>1–4 years post-GCGS</td>
<td>16%</td>
<td>UGDS Dutch Short MMPI SCL-90</td>
</tr>
<tr>
<td>De Cuypere et al. (2006)</td>
<td>Belgium</td>
<td>27 FtM 35 MtF Diagnosis: NR 26.9 years FtM 37.8 years MtF (pre-GCGS)</td>
<td>CHT 100% GCGS 100%</td>
<td>Single centre (Gender clinic)</td>
<td>Retrospective</td>
<td>Pre-vs post-GCGS</td>
<td>4.1 years MtF 7.6 years FtM</td>
<td>42%</td>
<td>UGDS SCL-90</td>
</tr>
<tr>
<td>Udeze et al. (2008)</td>
<td>UK</td>
<td>40 MtF DSM-IV 47.3 years</td>
<td>CHT NR GCGS 100%</td>
<td>Single centre (Gender clinic)</td>
<td>Prospective</td>
<td>Pre-vs post-GCGS</td>
<td>0.5 years post-GCGS</td>
<td>NR</td>
<td>SCL-90 Psychiatric clinical interview for ICD-10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 FtM 18 MtF Multicentre (2 gender clinics)</td>
<td>CHT 88% GCGS 100%</td>
<td>Pre-vs post-GCGS</td>
<td>9 years post-GCGS</td>
<td>30%</td>
<td>Psychiatric symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors (year)</td>
<td>Country</td>
<td>Number of trans participants/diagnosis/ mean age at assessment</td>
<td>Number of trans participants/diagnosis/ mean age at assessment</td>
<td>Treatment status: (on CHT or post GCGS)</td>
<td>Study design</td>
<td>Comparative groups</td>
<td>Length of follow-up post-treatment</td>
<td>Lost to follow-up</td>
<td>Outcome measure</td>
</tr>
<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Johansson et al. (2010)</td>
<td>Sweden</td>
<td>ICD-10 27.8 years Fm 37.3 years MtF</td>
<td>ICD-10 27.8 years Fm 37.3 years MtF</td>
<td>Prospective</td>
<td>Global outcome patient and clinician</td>
<td>Anxiety, 7.1% received ongoing psychiatric treatment. Differences pre-/post-treatment: Global clinician outcome: Improved 62%, Unchanged 24%. Global patient outcome: Improved 95%, Worse 5%. Gender: no differences Age of onset: no differences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pimenoff &amp; Pfaefflin (2011)</td>
<td>Finland</td>
<td>17 FtM 15 MtF Diagnosis NR 37.5 years Fm 44.4 years MtF</td>
<td>17 FtM 15 MtF Diagnosis NR 37.5 years Fm 44.4 years MtF</td>
<td>CHT 100% GCGS 100%</td>
<td>Pre- vs post-GCGS</td>
<td>Single centre (Gender clinic) Retrospective</td>
<td>5 years Post-GCGS</td>
<td>16.2%</td>
<td>University of Minnesota Questionnaire</td>
</tr>
<tr>
<td>Colizzi et al. (2013)*</td>
<td>Italy</td>
<td>25 FtM 45 MtF DSM-IV-TR 26.7 years Fm 29.2 years MtF</td>
<td>25 FtM 45 MtF DSM-IV-TR 26.7 years Fm 29.2 years MtF</td>
<td>CHT 100% GCGS 0%</td>
<td>Pre- vs post-CHT</td>
<td>Single centre (Gender clinic) Prospective</td>
<td>1 year Post-CHT</td>
<td>0</td>
<td>PSS</td>
</tr>
<tr>
<td>Colizzi et al. (2014)*</td>
<td>Italy</td>
<td>29 FtM 78 MtF DSM-IV-TR 26.7 years Fm 29.2 years MtF</td>
<td>29 FtM 78 MtF DSM-IV-TR 26.7 years Fm 29.2 years MtF</td>
<td>CHT 100% GCGS NR</td>
<td>Pre- vs post-CHT</td>
<td>Single centre (Gender clinic) Prospective</td>
<td>1 year Post-CHT</td>
<td>0</td>
<td>SCID-1, SAS, SDS, SCL-90R</td>
</tr>
<tr>
<td>Heylens et al. (2014b)</td>
<td>Belgium</td>
<td>11FtM 46 MtF DSM-IV-TR NR</td>
<td>11FtM 46 MtF DSM-IV-TR NR</td>
<td>CHT 100% GCGS 81%</td>
<td>Pre- vs post-CHT</td>
<td>Single centre (Gender clinic) Prospective</td>
<td>3–6 months Post-CHT</td>
<td>75–26.3%</td>
<td>SCL-90, Psychosocial questionnaire</td>
</tr>
<tr>
<td>Ruppin &amp; Pfafflin (2015)</td>
<td>Germany</td>
<td>36 MtF 35 MtF ICD-10 14.1 years Fm 13.7 years MtF</td>
<td>36 MtF 35 MtF ICD-10 14.1 years Fm 13.7 years MtF</td>
<td>CHT 100% GCGS 97.1%</td>
<td>Pre- vs post-treatment</td>
<td>Single centre (Gender clinic) Retrospective</td>
<td>13.3 years Post-GCGS</td>
<td>49.3%</td>
<td>SCL-90R, IIP, FPI, R</td>
</tr>
</tbody>
</table>

AIM, affect intensity measure; CHT, cross-sex hormonal treatment; FPI-R, Freiburg Personality Inventory; FtM, female to male subjects, trans men; GCGS, gender confirmation genital surgery; IIP, Inventory of Interpersonal Problems; MMPI-2, Minnesota Multiphasic Personality Inventory, second version; MtF, male to female subjects, trans women; NA, not applicable; NR, not reported; PSS, Perceived stress scale; SCID-I, Structured Clinical Interview for DSM-IV, Axis I disorders; SAS, Zung Self-Rating Anxiety Scale; SAQ, Short Anger Situation Questionnaire; SCL-90, Symptom Checklist-90; SCL-90R, Symptom Checklist-90 revised; SDS, Zung Self-Rating Depression Scale; UGDS, Utrecht Gender Dysphoria Scale.

*Studies using the same data.
Results

Cross-sectional studies

Psychopathology

Studies investigating prevalence rates of psychopathology range from rates that are comparable to the general population (Colizzi et al., 2014; Simon et al., 2011; Smith et al., 2005) to the trans group having worse scores than the cis controls (Auer et al., 2013; Davey et al., 2014; Heylens et al., 2014b). The prevalence and nature of psychopathology in trans women was found to be more comparable to cis women than to cis men, the former showing a two- to threefold higher occurrence of affective problems when compared with cis men (Auer et al., 2013).

Psychiatric disorders, Axis I

The Axis I diagnoses found in all the studies reviewed were mainly affective and anxiety disorders. The occurrence of severe psychiatric conditions, such as schizophrenia or bipolar disorder, was rare. Only one study looking at Axis I disorders compares a trans group with a cis control group matched for age, natal sex and new assigned sex (Dhejne et al., 2011). This study, which uses data from the national register in Sweden, focuses on trans people following gender-confirming medical interventions and found higher rates of psychiatric disorders and suicide in this group. It found, however, that there was an improvement over time, i.e. rates of psychiatric disorders and suicide became more similar to controls over time; for the period 1989–2003, there was no difference in the number of suicide attempts compared to controls.

Psychiatric disorders, Axis II

Only one study (Duisin et al., 2014) used a (non-matched) control group when assessing Axis II psychiatric disorders. This found higher rates of personality disorders in the trans group, primarily paranoid and avoidant personality disorders. The study is limited by the small number of patients studied. The rest of the studies that assessed Axis II disorders did not use control groups. The prevalence rates of Axis II disorders ranged from 4.3% (Fisher et al., 2013) to 81.4% (Mazaheri Meybodi et al., 2014b). The type of personality disorder varied from predominantly cluster B (Hepp et al., 2005; Madeddu et al., 2009; Mazaheri Meybodi et al., 2014b) to predominantly cluster C (Heylens et al., 2014a).

Risk factors for psychopathology and psychiatric disorders

The majority of the studies comparing trans women and trans men found no differences in psychiatric disorders and psychopathology between the two groups. Four studies did find psychiatric disorders and psychopathology to be more prevalent among trans women than trans men (Claes et al., 2015; Duisin et al., 2014; Gomez-Gil et al., 2009; Hoshiai et al., 2010). Conversely, Haraldsen & Dahl (2000) found that trans women scored lower on the SCL-90R test than trans men.

One study (Heylens et al., 2014a) found no differences between the age of onset and psychiatric disorders.

As found in the general psychiatric literature, two studies investigating psychopathology among trans people also found that being in a relationship was a positive factor, associated with a reduction of psychopathology (Gorin-Lazard et al., 2012; Weyers et al., 2009).

Longitudinal studies

An improvement of psychiatric morbidity and psychopathology following GCMI was seen in all of the studies except one (Udeze et al., 2008). This study found no differences between pre- and post-SCL-90R scores, which is probably due to the low levels of psychopathology as measured by the SCL-90R pretreatment. The majority of the studies found post-treatment scores on questionnaires measuring psychopathology and gender dysphoria to be similar to normative data.

Predictors for positive outcome following GCMI

Four longitudinal studies explored post-treatment outcome predictors and found better outcomes for trans men (Smith et al., 2005) and those who were young on assessment (De Cuypere et al., 2006). Two studies did not find gender or age of onset to be predictors of outcome following GCGS (Johansson et al., 2010; Pimenoff & Pfafflin, 2011). Interestingly, one study compared patients who had been compliant with their treatment plan with those who had not, and found no differences in outcome (Pimenoff & Pfafflin, 2011).

Discussion

The aim of this review was to explore the literature in the field of mental health/psychiatry and gender dysphoria. Overall, it was found that trans people attending transgender health-care services present with a high prevalence of psychiatric disorders and psychopathology.
The review indicates that the level of psychopathology appears to be higher in this population than in cis controls, although it cannot reach firm conclusions as to whether the rate of psychiatric disorders is higher in trans people than in controls, due to the lack of well-matched controlled studies exploring psychiatric disorders.

The only study using a robust methodology concludes that trans people present with higher levels of psychiatric disorders post-GCMI than cis controls. However, this study looks at trans people who were treated in some cases more than 20 years ago, when society and interventions may have been very different. Studies investigating the outcome of trans people who transitioned a long time ago will be very different from those looking at individuals who transitioned in the 21st century, and although this study offers longer follow-up data, these will be affected by changes in the levels of transphobia and discrimination over time. Furthermore, surgical results were less good at that time, which is also known to affect transgender health negatively (Bauer et al., 2015; Lawrence & Zucker, 2012).

The studies reviewed in this paper include trans people at different stages of transition within the same cohort, which is confusing, and does not allow for clear conclusions to be drawn as to the levels of psychopathology and psychiatric disorders in non-treated trans people. Only one study (Heylens et al., 2014a) provides clear information regarding the rates of psychiatric disorders pretreatment. It found that, at the time of assessment and before treatment was commenced, 38% of those attending transgender health-care services presented with an Axis I diagnosis, and 15% with an Axis II diagnosis.

As all of the studies use data collected at the time of assessment at a transgender health-care service, the results regarding levels of psychopathology and psychiatric disorders cannot be generalized to trans people not in contact with clinical services. In order to clarify whether there is a difference between these groups it may be interesting to look at studies exploring lifetime psychiatric disorders. Four studies provide this information (Bandini et al., 2011; Gomez-Gil et al., 2009; Hepp et al., 2005; Heylens et al., 2014a). Of particular importance is the study by Heylens et al. (2014a), which showed clear differences between current (38%) and lifetime (70%) levels of psychiatric disorders. This shows that the rate and severity of psychiatric disorders and psychopathology may be underrepresented if data is taken only from trans people at the time they are being assessed at transgender health services; the rate may be considerably higher in those who are not on a pathway towards treatment.

The majority of the psychiatric problems detailed in the studies relate to affective disorders such as depression and anxiety. Major psychiatric problems (e.g. schizophrenia and bipolar disorder) were not found any more frequently in trans people than in the general population. Dissociative disorders were only evaluated in one study (Colizzi et al., 2015).

The results with respect to gender differences in both pre- and post-treatment cross-sectional studies were contradictory. The majority of the studies showed no differences between the genders, but, except for one study (Haraldsen & Dahl, 2000) those studies that did identify differences found that trans women were more prone to develop psychological/psychiatric problems than trans men (Colton-Meier et al., 2013; De Cuypere et al., 1995; Landén et al., 1998; Lothstein, 1984). This finding could indicate that trans women show a psychological and vulnerability profile for the development of affective disorders that resembles that of natal women (Auer et al., 2013). Biologically, this could be explained by recent findings using neuro-imaging that reveal that non-treated trans women have cerebral cortical thickness similar to cis women (Zubiaurre-Elorza et al., 2012). However, the increased levels of psychiatric disorders in trans women could also be explained by the higher risk of stigma and discrimination within this group; this may contribute to the interpersonal problems that one study found made trans women more hypersensitive to rejection (Davey et al., 2015; Simon et al., 2011).

The fact that some studies that included trans people who had been treated with GCMI found higher levels of psychopathology and psychiatric disorders (Dhejne et al., 2011) than cis controls cannot be used as evidence for the efficacy (or otherwise) of GCMI. Studies that compared different cohorts of patients (pre CHT/GCGS versus post CHT/GCGS) are only helpful in this regard when they are well controlled for psychopathology and known factors affecting psychopathology, between both groups (Gomez-Gil et al., 2012; Gorin-Lazard et al., 2013; Fisher et al., 2014).

The effect that gender-confirming medical interventions have in improving mental health can only be concluded from longitudinal studies. This review found that longitudinal studies investigating the same cohort of trans people pre- and post-interventions showed an overall improvement in psychopathology and psychiatric disorders post-treatment. In fact, the findings from most studies showed that the scores of trans people following GCMI were similar to those of the general population. Although this is likely to be a response to the gender-confirming treatment itself, i.e. the sense of
the body being more aligned to the person’s experienced gender, it cannot be ruled out that it relates instead or as well to the benefits that accrue from being validated and accepted for treatment (Nuttbrock et al., 2011). In order to help clarify this it is important to look at follow-up studies that assess trans people a relatively long time after treatment. Five studies (De Cuypere et al., 2006; Johansson et al., 2010; Pimenoff & Pfafflin, 2011; Ruppin & Pfafflin, 2015; Smith et al., 2001) that followed trans people for more than 2 years (maximum 13.3 years) post-treatment showed encouraging results that point towards the benefits of treating trans people with GCMI.

Although it was not the main aim of this review, we also explored risk factors for psychiatric disorders among the trans population. Victimization (social stigma, discrimination, transphobia, sexual abuse, gender abuse), difficulties accessing health care and social services, gender (as explained above) and interpersonal problems were all found to put trans people at risk of developing psychiatric disorders, particularly depression. Trans individuals were also found to receive, or perceived themselves to receive, less social support from their family and friends than non-trans siblings and matched general population (Davey et al., 2014; Factor & Rothblum, 2007; Gooren et al., 2015; Kim et al., 2006; Simon et al., 2011). Social and parental support, completed medical transition, and disclosure of transgender identity were all protective factors (Bandini et al., 2011; Bauer et al., 2015; Bazargan & Galvan, 2012; Bockting et al., 2013; Clements-Nolle et al., 2006; Davey et al., 2015; Gehring & Knudson, 2005; Gooren et al., 2015; Lombardi et al., 2001; Nuttbrock et al., 2011, 2014; Rotondi, 2011).

Quality of the studies

Almost all of the studies reviewed showed selection bias. Since most included only individuals attending transgender health-care services, the results are not generalizable to the overall trans population. Many studies are also limited by the inclusion of trans people at different stages of treatment. Longitudinal studies are also limited by lost-to-follow-up data and short follow-up time; only registry-based studies do not have lost-to-follow-up data, but their cross-sectional design fails to measure improvement of psychopathology within the same individual following GCMI. Furthermore, they are limited by the lack of matching according to known risk factors for psychiatric disorders and psychopathology within the general population (Dhejne et al., 2011).

Implications for future research

Although the studies measuring the prevalence of psychiatric disorders in trans people attending clinical services are robust and reach firm conclusions, future studies could explore the rates among those trans people not attending clinical services. Future studies could also benefit from more detailed and better controlled longitudinal studies. Due to the low prevalence of trans individuals attending clinical services (Arcelus et al., 2015), larger cohort multicentre studies such as the European Network Initiative of Gender Incongruence (ENIGI) project (Kreukels et al., 2012) may strengthen recruitment rates. Studies such as this may be limited by several factors including the variability of the interventions provided and the levels of discrimination and transphobia in different countries.

Although psychiatric morbidity should be studied as a secondary outcome of gender-confirming medical interventions, studies should primarily explore the role of those interventions in reducing gender dysphoria. A robust measure is needed to relate the primary outcome for GCMI to gender dysphoria. The variability of tools to measure gender and body dysphoria does not allow firm conclusions to be drawn, and this suggests the need for a stronger measurement tool.

In summary, this review indicates that, although the levels of psychopathology and psychiatric disorders of trans people attending transgender health-care services are higher than the cis population at the time of assessment, they do improve following gender-confirming medical intervention, in many cases reaching normative values. Information on trans people not in contact with services is lacking. While gender-confirming medical intervention improves mental health, trans people are still a vulnerable group.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References


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