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Risk Factors and Clinical Correlates of the Treatment Pathway for People with Gender Dysphoria

Walter Pierre Bouman

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RISK FACTORS AND CLINICAL CORRELATES OF THE TREATMENT PATHWAY FOR PEOPLE WITH GENDER DYSPHORIA

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"Jonentzat,
nire begiak irekitzen
ditudanetik ametsetan murgiltzen
naizen arte zoriontsu egin eta betetzen
nauena.
Eskerrik asko denagatik."

“Zoveel soorten van verdriet,
ik noem ze niet.
Maar één, het afstand doen en scheiden.
En niet het snijden doet zo’n pijn,
Maar het afgesneden zijn.”

M Vasalis (*Vergezichten en Gezichten* – 1983)

ABSTRACT

There is an increasing awareness and visibility of transgender people, particularly in Europe and North America. Compared to the non-trans general population transgender people remain a vulnerable group with higher levels of mental health problems due to existing discrimination and victimization as well as lack of adequate treatment options and legal protection in most countries.

This thesis consists of 5 studies to examine risk factors and clinical correlates of the treatment pathway of transgender people. The studies looked specifically at prevalence of transsexualism and mental health correlates, including Non-Suicidal Self-Injury (NSSI), body dissatisfaction and anxiety in transgender people as a population, but also as separate groups (young and older transgender people).

An overall meta-analytical prevalence for transsexualism of 4.6 in 100,000 individuals was found; 6.8 for trans women and 2.6 for trans men, which suggests a sex ratio of trans females to trans males of 2.62 to 1. More importantly, time analysis found a clear increase in reported prevalence over the last 50 years, which highlights the need to plan for expansion of transgender health services and training and education for a future workforce in this field.

A lifetime presence of Non-Suicidal Self-Injury (NSSI) of nearly half of all young transgender patients was founds and more than a quarter reported current NSSI.
Risk factors for current and lifetime Non-Suicidal Self-Injury (NSSI) in young transgender people are being a trans male and having greater psychopathology. General psychopathology could be predicted by transphobic experiences, low self-esteem, and interpersonal problems.

Transgender individuals exhibit greater body dissatisfaction than cisgender controls and, importantly, transgender men have comparable body dissatisfaction scores to cisgender men with an eating disorder. In relation to the roots of their body dissatisfaction, both transgender men and transgender women experience greatest dissatisfaction not only with gender-identifying body parts, but also with body shape and weight. Transgender men may be at particular risk for the development of maladaptive eating behaviours and other body image-related behaviours.

The vast majority of older people presenting at transgender health services over the age of 50 years old are transgender females, with a sex ratio of transgender females to transgender males of 23.7:1. The use of cross-sex hormones prior to seeking treatment is widespread among transgender females and appears to be associated with psychological benefits.

There are high rates of possible (32.8%) and probable (36.0%) current anxiety disorder in untreated transgender people attending a transgender health service. Transgender people have an almost 3-fold increased risk of probable anxiety disorder compared with the cisgender general population. Trans males show higher rates of possible and probable anxiety disorder (71.1%) than trans females. Low self-esteem and interpersonal functioning are predictors of anxiety disorder in the transgender population, which highlights the importance of psychological intervention and support.

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I deeply appreciate all the support I have received from my family and friends, old and new, with origins from across the world: The Netherlands, Spain, Belgium, United Kingdom, Australia, Sweden, Germany, United States, Canada. In particular, I would like to thank mr drs Robert Zomer, who has taught me many a wise saying, but whose saying "als je ergens aan begint, komt er op een gegeven moment een einde in zicht; als je nooit begint, komt het ook nooit af" has been a first step towards registering to do this thesis. There are many more wise sayings I could share with you from Robert, but I will refrain from these here and now.

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If there is one thing this thesis has taught me, it is never a one man's band, but a true collaborative and developmental process with continuous multi-agency input. Don't ever try this alone at home!!

The reason for this thesis, ultimately, is to serve my patients and their families (of choice) and to hope that research might help to improve their quality of life. Hence, I feel forever indebted to all patients who have shared their lives, their stories and their journeys with me.

And finally, to leave you all with the motto of the Christoffelaars: "Op de liefde die ons bindt!".

INDEX

LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
APA	American Psychiatric Association
BMI	Body mass index
CHT	Cross-sex hormones treatment
CI	Confidence interval
CST	Cross-sex hormone treatment
DoH	Department of Health
DSD	Differences of Sex Development
DVT	Deep vein thrombosis
EDI	Eating Disorder Inventory
ENT	Ear, nose & throat
ETS	Experiences of Transphobia Scale
FTM	Female to Male
GAS	Gender affirming surgery
GICs	Gender identity clinic service
GIDAANT	Gender Identity Disorder of Adolescents and Adulthood
GCMI	Gender confirming medical interventions
GCS	Gender confirming surgery
GCT	Gender Confirmation Treatment
GD	Gender Dysphoria
GID	Gender identity disorder
GnRH-A	Gonadotropin-releasing Hormone Analogue
GNC	Gender non-conforming
GP	General Practitioner
GRA	Gender Recognition Act
GRC	Gender Recognition Certificate
GRP	Gender Recognition Panel
GRS	Gender reconstructive surgeries
GSI	Global Severity Index
HADS	Hospital Anxiety and Depression Scale
HDBS	Hamburg Body Drawing Scale
HIV	Human immuno virus
HRA	Health Research Authority
ICD	International Classification of Diseases
IIP	Inventory of Interpersonal Problems
IPT	Interpersonal Psychotherapy
LGB	Lesbian, Gay and Bisexual
LGBT	Lesbian, gay, bisexual, and transgender
MANCOVA	Multivariate analysis of covariance
MSPSS	Multidimensional Scale of Perceived Social Support
MTF	Male to Female
NCGD	Nottingham Centre for Gender Dysphoria
NICE	National Institute for Clinical Excellence
NHS	National Health Service
NSSI	Non-Suicidal Self-Injury
PE	Pulmonary embolism
PSA	Prostate-specific antigen
RSE	Rosenberg Self-esteem scale
SCL	Symptom Checklist

SD	Standard deviation
SE	Standard error
SIQ	Self-injury questionnaire
SLT	Speech and language therapist
SoC	Standards of Care
SPSS	Statistical Package for the Social Science
SRS	Sex Reassignment Surgery
TG	Transgender
TM	Trans men
TS	Transsexualism Gender non-conforming
TW	Trans women
USA	United States of America
WHO	World Health Organization
WPATH	World Professional Association of Transgender Health

PREFACE

This thesis was presented to the University of Barcelona in fulfilment of the requirements for a Doctor's degree. Five articles are included, conducted at the Nottingham Centre for Transgender Health (previously called Nottingham Centre for Gender Dysphoria (Nottingham, United Kingdom) in collaboration with other research centres, including part of the CIBERobn research network. The articles have been published in international scientific journals, and achieve a global impact factor (IF) score of **12.50**. The IF of overall published collaborations accumulates to **48.86**. [Science Citation Index, 2015]

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COLLABORATING INSTITUTIONS

Bellvitge Hospital
Institut Català de la Salut

IDIBELL
Institut d'Investigació Biomèdica de Bellvitge

ciberobn
Centro de Investigación Biomédica En Red
Fisiopatología de la Obesidad y Nutrición

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CHAPTER 1. INTRODUCTION

1.1. *Legislation for Transgender People*[1]

The year 2003 signified an important step forwards for the legal rights and clinical care needs of transgender people in the United Kingdom (UK). The UK Government published a Draft Gender Recognition Bill (Great Britain, 2003) leading to the enactment of the Gender Recognition Act 2004 (Mahendra, 2004; Sohrab, 2004). The Act gives legal recognition to the acquired or reassigned gender of a transgender person. Prior to the enactment of the GRA on 1 July 2004 transgender people had been treated in UK law as belonging to the biological sex of their birth. The fact that they had lived for many years in the opposite gender to which they were assigned at birth, or had received cross-sex hormone treatment and/or gender confirming surgery was immaterial. The case of *Corbett v. Corbett*, decided more than four decades ago, confirmed biological features as the legal determinants of gender (Sandland, 2009). In *Corbett*, a case concerning the validity of a marriage between a male petitioner, Arthur Corbett, and a transgender woman,[2] April Ashley, judge Ormrod held that sex is determined at birth and by a congruence of chromosomal, gonadal and genital factors. In doing so he ignored the importance of psychological and hormonal factors in the development of gender identity (Bouman & Arcelus, 2017a; Garcia-Falgueras & Swaab, 2008; Kreukels & Guillamon, 2016). The legal test for determining whether an individual is female from birth was based on the simultaneous presence of XX chromosomes, ovaries and female genitalia. Following *Corbett* the English courts have applied these biological criteria in cases concerning birth certificates, social security, sex discrimination, unfair dismissal, equal pay, marriage and criminal law (Sharpe, 2002).

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[1] Transgender is broadly defined and used as an umbrella term to refer to a diverse group of individuals who cross or transcend culturally defined categories of gender; this group includes transsexual people (who feminize or masculinize their body through hormone treatment and surgery), cross dressers (who wear clothing associated with the other sex for varied reasons), drag queens and kings (female and male impersonators) and individuals self-identifying as bi-gender (both man and woman), gender queer, gender variant or transgender (Bockting, W.O., 2009). At the same time I recognize that not all individuals within this diverse group self-identify as transgender and this may be independent of whether they have received cross-sex hormone treatment and/or gender confirming surgery or not.

[2] In medical and legal discourse the prefix 'post-operative' is often used before [a] transgender [person] to denote the normative concept that a woman has female genitalia. I shall not be using this prefix as it labels the transgender person and is discriminatory because it is never used in relation to a range of other surgical interventions and because it encourages the view that gender confirming surgery is the proper end of a transgender person's journey.

Consequently, transgender people had not been able to obtain a birth certificate in their acquired gender. They faced significant and embarrassing intrusion into their private lives when they had to produce one in the course of their employment or when seeking State benefits. Furthermore, transgender people had been unable to marry in their acquired gender. A transgender woman, for example, could not marry her male partner because in law she remained a man, and same-sex marriages were not permitted at that time. These difficulties were further compounded by the practical problems faced by transgender people who were in 'legal limbo'. By way of illustrations, if a transgender woman required hospital admission she may have been placed on a male ward (DoH, 2007); in the workplace employers may have insisted that until transgender people have had gender-confirming surgery they use either the toilets and changing facilities of their birth sex or the disabled facilities (Whittle, 2007). The enactment of the Gender Recognition Act 2004 in the United Kingdom has assured that transgender people are now legally recognised in their acquired and/or experienced gender.

1.2. Standards of Care for Transgender People

Also in 2003, the Royal College of Psychiatrists established an Intercollegiate Committee to develop good clinical practice guidance for the delivery of professional Standards of Care [3] (SoC) for people with gender dysphoria [4] in the United Kingdom. The Intercollegiate Committee conducted the largest ever consultation involving representatives from the Royal College of Psychiatrists, Royal College of Physicians, Royal College of Surgeons, Royal College of Obstetricians and Gynaecologists, Royal College of General Practitioners, Royal College of Nursing, Royal College of Paediatricians, Royal College of Speech and Language Therapists, Association of Hypnotherapists and Psychotherapists, National Association of Councillors and UK

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[3] Standards of care are clinical guidelines outlining the usual treatment pathway for transgender people who wish to undergo cross-sex hormone treatment and/or gender-confirming surgery.

[4] Gender dysphoria refers to a symptom, which denotes the personal experience of dissonance between one's gender and phenotype. Gender dysphoria (as a symptom) is not mentioned in the *International Classification of Diseases* (ICD) version10 of the World Health Organization (WHO) at all, whilst it was introduced in the *Diagnostic and Statistical Manual of Mental Disorders* Fourth edition (DSM-IV) of the American Psychiatric Association (APA) as previously defined (p.536). When the DSM-5 was published in 2013 Gender Dysphoria (GD) was also introduced as one overarching diagnosis, replacing Gender Identity Disorder (GID) in the DSM-IV, with separate developmentally appropriate criteria sets for children and for adolescents and adults (APA, 2013).

Council for Psychotherapy, the World Professional Association of Transgender Health (WPATH) Standards of Care Committee and the independent (private healthcare) sector. Independent service users participated alongside user representatives from the Gender Trust, Press for Change (PFC), FTM (Female to Male) Network and the Gender Identity Research and Education Society (GIRES). Furthermore, other professionals were consulted for specific advice where expertise was not available within the core committee (Wylie, 2008). A wide consultation followed the drafting of the guidelines, which attracted a substantial number of responses. These were then considered further by the committee and, where considered appropriate, assimilated within the guidance. During the years since its inception the Intercollegiate Committee met on many an occasion to develop Standards of Care specific to a nationalized social healthcare system like the National Health Service (NHS) in the UK, where healthcare is free at the point of access. The UK Standards of Care entitled "Good practice guidelines for the assessment and treatment of adults with gender dysphoria" were published in 2013 (Royal College of Psychiatrists, 2013; Wylie, Barrett, Besser, Bouman, Bridgman et al., 2014). The overall goal of the *Good Practice Guidelines* is to provide clinical guidelines for health professionals 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, gynecological and urological care, reproductive options, voice and communication therapy, mental health services (e.g., assessment, counselling, psychotherapy), and hormonal and surgical treatments (Wylie et al., 2014). Furthermore, the *Good Practice Guidelines* sets out standards of care to adhere to with the aim to strive towards a certain standardization of care so that all clients and patients with gender dysphoria within a certain large geographical region receive a similar service (Bouman, 2014).

1.3. Diagnostic Classification for Gender Dysphoria

Terminology and diagnosis are important elements in the provision of clinical care, which can offer a mutual language and framework, both clinical and bureaucratic, within which we can expediently work together for the benefit of our patients. Two clinical diagnostic classification systems for gender dysphoria exist. The *International Classification of Diseases* (ICD-10; WHO, 1992) of the World Health organization (WHO) and the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; APA, 2013) of the American Psychiatric Association (APA) both classify people with gender dysphoria within their diagnostic framework. The ICD-10 uses the term transsexualism, which it defines as: A desire to live and be accepted as a member of the opposite sex, usually accompanied by a sense of discomfort with, or inappropriateness of, one's anatomic sex, and a wish to have surgery and hormonal treatment to make one's body as congruent as possible with one's preferred sex (World Health Organization (1992) *International Classification of Diseases*, 10th revision (ICD-10), Geneva, WHO, pp. 215-217).

The DSM-5 utilises the term 'Gender Dysphoria' (GD) instead of transsexualism[5]. The following criteria must be met for the diagnosis of GD in Adolescents and Adults to be made: A marked incongruence between one's experienced/expressed gender and assigned gender, of at least six months' duration, as manifested by at least two of the following: (1) A marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics (or in young adolescents, the anticipated secondary sex characteristics); (2) A strong desire to be rid of one's primary and/or secondary sex characteristics because of a marked incongruence with one's experienced/expressed gender (or in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics); (3) A strong desire for the primary and/or secondary sex characteristics of the other gender; (4) A strong desire to be of the other gender (or some alternative gender different from one's assigned gender); (5) A strong desire to be treated as the other gender (or some alternative gender different from one's assigned gender); (6) A strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender). The condition is associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning (APA, 2013, pp. 451-459).

The *Diagnostic and Statistical Manual of Mental Disorders* of the American Psychiatric Association and the *International Classification of Diseases* of the World Health Organization not only determine how mental disorders are defined and diagnosed globally, it also impacts on how people see themselves; how we see each other and how society sees us. And it is here that the controversy lies, for while diagnostic terms facilitate clinical care

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[5] I do not agree with the fact that Gender Dysphoria and Transsexualism are classified as a mental disorder. I have made my position clear elsewhere. See, for example, Bouman, Bauer, Richards et al., 2010 and Richards, Arcelus, Barrett, Bouman, Lenihan et al., 2015. However, I shall use the terminology Gender Dysphoria and Transsexualism in this thesis as defined within the existing psychiatric classification systems and thus adhere to current general use of Gender Dysphoria and Transsexualism in medical and legal discourse, where required.

and access to insurance coverage for mental health difficulties in the USA and some other countries, these terms can also have a stigmatising effect (Bouman & Richards, 2013). The DSM-5 claims to avoid stigma and ensure clinical care for individuals who see and feel themselves to be a different gender than which they were assigned at birth. It makes several important clarifications in the criteria, chief of which is arguably the replacement of the diagnostic name *Gender Identity Disorder* with *Gender Dysphoria.* This situates the pathology within the dysphoria rather than within the gender identity itself and is consequently rather more palatable to many transgender people. It does not, however, remove the problem of having a diagnosis related to this condition within a manual of mental disorders which, irrespective of the name used, many transgender people take umbrage with due to the stigma surrounding having a diagnosis of mental disorder (Bouman & Richards, 2013; Pilgrim, 2005).

Interestingly, the World Health Organization (WHO) has been increasingly questioning the veracity of a mental health diagnosis for being transgender. The WHO is a specialized agency of the United Nations (UN) representing 194 countries that is concerned with public health. It is also responsible for developing and publishing the ICD (the current edition being the ICD-10, WHO, 1992) which provides a system of diagnostic codes for classifying diseases, including nuanced classifications of a wide variety of signs, symptoms, conditions, abnormal findings, complaints, social circumstances, and external causes of injury or disease. This system is designed to promote international comparability in the collection, processing, classification, and presentation of health care statistics. The ICD is used throughout most of the world, including the United Kingdom.

The DSM seen above, although limited only to mental and behavioural disorders, is therefore analogous to the ICD. In contrast to the DSM, however, the WHO Working Group on the Classification of Sexual Disorders and Sexual Health for the forthcoming ICD-11 has recommended abandoning a psychopathological model of transgender identity in favour of a model that reflects current scientific evidence and best practice, responds better to the needs and rights of this vulnerable population, and is more supportive of the provision of accessible and high-quality health care services. The WHO Working Group has therefore recommended reconceptualizing categories related to transgender identity with this in mind. Thus, in addition to recommending a name change from *Transsexualism* to *Gender Incongruence*, the WHO Working Group has strongly recommended that the diagnosis be removed from the ICD-11's section on mental and behavioural disorders (Drescher, Cohen-Kettenis, & Winter, 2012). The proposals have been field-tested (Beek, Cohen-Kettenis, Bouman, de Vries, Steensma et al., 2016, 2017) and are open to public review and comment (WHO, 2013). Unfortunately, the ICD-11 is not expected to be published until 2018, which means that, despite various calls for harmonization between the DSM and ICD this is unlikely to materialize for Gender Dysphoria (and Gender Incongruence) in the near future. Consequently, gender dysphoria *as a diagnosis* will be considered a mental health condition in the DSM (as are all diagnoses in this manual), but not in the next version of the International Classification of Diseases (ICD-11).

More than a decade after the introduction of legislation to safeguard the rights of people with gender dysphoria in the UK and following the publication of the Good practice guidelines for the assessment and treatment of adults with gender dysphoria (Wylie, Barrett, Besser, Bouman, Bridgman et al., 2014) this thesis examines risk factors and clinical correlates of the treatment pathway for people with gender dysphoria. In order to contextualize the findings of the various studies in this thesis, and to facilitate readability of the entire manuscript the next and second chapter of this thesis describes language and terminology in transgender health. Terminology has changed significantly over a relatively short period of time and many new terms have been introduced, whilst some older ones have fallen in disrepute. Chapter 3 discusses the increase in the number of people with gender dysphoria who seek assessment, support and treatment at transgender health services. It also gives an overview of the treatment pathway for people with gender dysphoria within the National Health Service (NHS) in the United Kingdom. Chapter 4 describes the aims and objectives of the thesis. Chapter 5 describes the methodology of the thesis. Chapter 6 constitutes the results of the thesis and hence five papers are presented that make up this thesis. The first paper (study 1) concerns a systematic review and meta-analysis of prevalence studies in transsexualism. The second paper (study 2) is a matched control study of body image dissatisfaction and eating-related psychopathology in trans individuals. The third paper (study 3) entitled 'Risk Factors for Non-Suicidal Self-Injury Among Trans Youth' explores the prevalence of Non-Suicidal Self-Injury (NSSI) in young trans people and identifies risk factors for this group. The fourth paper (study 4) focuses on older trans people who seek treatment at transgender health services and is named 'Sociodemographic Variables, Clinical Features, and the Role of Preassessment Cross-Sex Hormones in Older Trans People'. The last paper (study 5) reports a study, which examines anxiety in a treatment-seeking population of adult transgender people and compares the findings with the general population. Chapter 7 concerns the general discussion of the findings of the various studies, whilst chapter 8 discusses the limitations of the studies. Chapter 9 lists the main findings and conclusions of this thesis. The references are found in chapter 10. The thesis concludes with appendices, which include documentation regarding ethical approval for the studies and a curriculum vitae of the author.

Finally, transgender people, needing to access assessment and treatment at National Health Services (NHS) transgender health services, continue to face significant challenges in the United Kingdom. Access to treatment remains difficult. There are various factors, which contribute: lack of transgender health services, chronic lack of funding, lack of available psychological, endocrine and surgical expertise and clinical capacity. Waiting lists are excessively long. A first appointment at a transgender health services takes on average more than one year in the UK. Non-suicidal self-injury (NSSI) and anxiety and depressive symptomatology is high in transgender patients prior to treatment (Arcelus, Claes, Witcomb, Marshall, & Bouman, 2016; Bouman, Claes, Brewin, Crawford, Millet et al., 2017; Claes, Bouman, Witcomb, Thurston, Fernandez-Aranda, & Arcelus, 2015). There is an overall agreement that mental health symptoms and specific behaviours such as NSSI, reduce considerably following gender confirming medical interventions (GCMI), such as cross-sex hormone treatment and surgery, and reach the same values as in the cisgender[6] population (Arcelus & De Cuypere, 2017; De Cuypere et al., 2006; Johansson et al., 2010; Pimenoff & Pfäfflin, 2011; Ruppin & Pfäfflin 2015). This is likely to be a response to the GCMI itself, although the effect of being validated and accepted for gender confirming medical treatment may also play an important role (Nuttbrock et al., 2011). Post-surgical long-term follow-up in a transgender health service is often not available, partly due to the lack of clinical resources, compounded by long waiting lists. Undertaking long-term follow-up studies is vital, but presents real challenges (Arcelus & Bouman, 2016). It is costly and time consuming and focuses on transgender people who only seek medical treatment. It can also be argued that many people who transition successfully may simply disappear and 'blend into' our binary society, removing the transgender 'label or marker', with no wish or need for further input from transgender health services. Looking at protective and risk factors of mental

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[6] Cisgender or Cis: A person whose assigned gender is in line with their gender identity. Cisgender women and cisgender men (the Latin cis means "same") live in and identify with the same body in which they were born.

health problems in transgender people who are and are not receiving treatment should also be a focus of further research. Understanding the protective and risk factors of mental health problems may help us to develop support structures and psychosocial interventions to prepare transgender people for a successful transition and life post transition and post GCMI (Arcelus & Bouman, 2016; Arcelus & De Cuypere, 2017).

CHAPTER 2. LANGUAGE AND TERMINOLOGY

2.1. Introduction

There are many terms associated with being transgender and with transitioning (the process of changing one's gender presentation permanently to accord with one's internal sense of gender identity) that will be used in this thesis and hence this chapter explains and defines the various terms. It is important to have a clear understanding of the meaning of the terminology used in this field. Terminology has changed significantly over the years and many new terms have been introduced, whilst older ones have been discarded and are no longer deemed politically correct (Bouman, Suess Schwend, Motmans, Smiley et al., 2017). The community often referred to as the transgender or transgender community is an extraordinarily diverse group of people. Defining and quantifying the transgender population is problematic as there are currently few measurable and/or standardized criteria (e.g. physical, social, political, etc.) regarding what might or should constitute a transgender person. Furthermore, there is a relative invisibility in which many transgender people exist in their daily lives (Meier and Labuski, 2013). So I acknowledge (and apologize in advance) that the terminology used and described in this thesis does not necessarily completely capture everyone who identifies as transgender or gender non-conforming. Moreover, I have also gone though (and continue to go) through a developmental process in the use of language in transgender healthcare. This is visible in the published articles in this thesis over time. Nevertheless, terminology, and therefore vocabulary, are highly relevant when we connect with transgender people and their families (of choice) and friends. In addition, terminology and vocabulary are important when attempting to address and target a community for access to healthcare and education, health promotion, and disease prevention (Wylie, 2015).

The term transgender has become increasingly popular in the past decade and reflects and includes people with a less restrictive or binarized set of beliefs. More specifically, transgender (as an adjective) describes anyone whose gender identity, expression or behaviour is different from the assigned gender at birth based on the sexual characteristics. The term trans is also used as an abbreviation for transgender. People in this category may feel as if they are in the wrong gender, but this perception may not necessarily correlate with a desire for cross-sex hormone treatment or gender confirming surgery. So, it is fair to say that the field of transgender health remains in transition too as the associated terminology and vocabulary continue to evolve.

2.2. Gender

The Oxford Dictionary of English (Stevenson, 2010) states that the word ‘gender’ has been used since the 14th century as a grammatical term, referring to classes of noun designated as *masculine*, *feminine*, or *neuter* in some languages. The sense ‘the state of being male or female’ has also been used since the 14th century, but this did not become common until the mid 20th century. Although the words ‘gender’ and ‘sex’ both have the meaning ‘the state of being male or female’, they are typically used in slightly different ways: ‘sex’ tends to refer to biological differences, whilst ‘gender’ refers to cultural, social and/or psychological ones. In other words, biological ‘sex’ includes indicators such as sex chromosomes, anatomy of an individual's reproductive system, and secondary sex characteristics (for definitions see below), whilst ‘gender’ refers to one’s personal identification of one's own gender, based on an internal awareness (gender identity) and/or one’s social gender role and expression. In some people, the body they are born with does not align with their gender assigned at birth, and the person may identify, sometimes from a very early age onwards, as transgender, gender-nonconforming, non-binary, or any other term which one feels applies correctly to one’s experienced gender identity.

Gender is the central theme of this thesis. It therefore seems apt to start describing what we mean by the word ‘gender’. The traditional concept of ‘gender’ as a noun refers to the state of being male or female (typically used with reference to social and cultural differences rather than biological ones). The word ‘sex’ refers to the biological and physiological characteristics that define men and women, and ‘gender’ refers to the socially constructed roles, behaviours, activities, and attributes that a given society considers appropriate for men and women. Therefore, it is often stated that sex is something that does not change, whilst gender can change according to social structure (and of course according to how one experiences one’s own gender(identity)). I must, however, also state that gender is increasingly recognised and experienced as more than a binary concept of being male or female. Many people feel their gender does not fit within a binary model (E.g., see Richards, Bouman, & Barker, 2017). There are many people who identify their gender outside the traditional concept of male and female (Richards, Bouman, Seal, Barker, Nieder et al., 2016).

The sex and gender distinction is not universal. In ordinary speech, *sex* and *gender* are often - erroneously - used interchangeably and synonymously. Some dictionaries and academic disciplines give *sex* and *gender* different definitions while others do not.

2.3. Gender Role

John Money was a New Zealand psychologist, sexologist and author, who is well known for his research into sexual orientation and gender identity. From the 1950s onwards he was a professor of paediatrics and medical psychology at the Johns Hopkins University in Baltimore, Maryland, USA, where he set up the gender identity clinic. John Money coined the term 'gender role', and defined this as "all those things that a person says or does to disclose himself or herself as having the status of boy or man, girl or woman, respectively…………..Gender role is appraised in relation to the following: general mannerisms, deportment and demeanour; play preferences and recreational interests; spontaneous topics of talk in unprompted conversation and casual comment; content of dreams, daydreams and fantasies; replies to oblique inquiries and projective tests; evidence of erotic practices, and, finally, the person's own replies to direct inquiry" (Money, 1955). Although a person's sex as male or female is considered a biological fact, which is identical in any culture, what that specific sex means in relation to a person's gender role as a man or a woman in society varies in different cultures according to what things are considered to be masculine or feminine. Gender roles are learned from various, intersecting sources such as parental and familial influences, the socialization a child receives in and out of school, what is portrayed in the various media, the social, cultural, religious, and political values held by society and our direct environment, and many other external contacts or sources. It is also important to note that learning gender roles starts from birth and includes seemingly simple things like what colour outfits a baby is clothed in or what toys they are given to play with. However, the gender roles we learn and are expected to adhere to may not necessarily reflect how we want to act and behave. Many transgender and cisgender people report feeling uncomfortable with the gender roles they are expected to follow and live in ways that purposely and consciously challenge the often restrictive categories of male and female gender roles.

John Money made the concept of *gender* a broader, more inclusive concept than one of solely masculine or feminine, male or female. Gender included not only one's status as a man or a woman, but was also a matter of personal recognition, social assignment, and legal determination. In other words, gender was not only attributed and recognized on the basis of one's external genitalia (private parts), but also on the basis of other physical and behavioural criteria that go way beyond genital differences. Broadening the concept of gender, as John Money described innovatively all those years ago, may now seem rather trivial and outdated, but the concept of gender (and gender roles) continues to be broadened as well as critically examined. What many boys and men like to wear today may be something girls and women will want to wear tomorrow. Conversely, what many girls and women like to do today may be something boys and men will also like tomorrow. Many people, including clinicians and academics, do not support the notion that certain behaviours, activities, and attributes in our society are specifically male or female, or considered appropriate for, and applicable to, men or women only. Women can play soccer and lead large companies, whilst men may choose to be house fathers and have knitting as a hobby, to name but a few of the endless endeavours people may choose to undertake. The times when transgender women were expected to wear skirts or dresses and men trousers when attending transgender healthcare services are long gone, and such attitudes are nowadays – rightly - deemed inappropriate and offensive. The concept of gender is as much in flux as are all of us and our society. They are continuously evolving and developing. In this context, society's constructed rules are increasingly at a crossroads with regard to the assignment of a specific gender to an individual. Gender ambiguity deals with having the freedom to choose, manipulate and create a personal niche within any defined socially constructed code of conduct, whilst gender fluidity is outlawing all the rules of cultural gender assignment. It does not accept the existence of the rigidly defined binary gender of a man and a woman and believes in freedom to choose any kind of gender with no rules, no defined boundaries and no fulfilling of expectations associated with any particular gender. Population studies show that a small percentage of the population identifies as non-binary (for further reading see Richards, Bouman and Barker, 2017).

Nonetheless, most societies have only two distinct classes of gender, male and female, that correspond with the biological sexes of male and female. When a baby is born, society allocates the child to a gender, on the basis of their external genitalia. The assigned gender is subsequently specified on one's birth certificate and passport and most countries require that a passport gender marker is either female or male. A few countries, such as Australia, Bangladesh, Denmark, India, Nepal and New Zealand allow passports to have a non-binary gender marker, called X (unspecified), T (transgender or third gender), E (eunuch), or O (other), depending on the country. Having a non-binary marker on one's passport may make it difficult to travel to a country whose passports do not give that option. Also, some societies explicitly incorporate people who adopt the gender role opposite to their biological sex. For example, the two-spirit people amongst different indigenous North Americans – including the Winkte of the Lakota, the Nàdleehi of the Navajo, and the Badés of the Sioux, amongst others (Epple, 1998). Other societies include well-developed roles that are explicitly considered more or less distinct from archetypal female and male roles in those societies. Sometimes the gender of these people is referred to as a third gender. One such gender role is that adopted by the Hijras of India, Bangladesh and Pakistan (Nanda, 1990). Another example may be the Muxe found in the state of Oaxaca, in southern Mexico (Stephen, 2002). The Bugis people of Sulawesi, Indonesia have a social system accommodating five gender categories (Graham, 2004). There are many more examples, which go beyond the scope of this chapter (see for instance Bacigalupo, 2010; Herdt, 1993). The point is that, historically, there have been and are, many different expressions of gender in different societies all over the world. Some of these gender expressions are embedded and well accepted within their culture and society, whilst others are less so.

2.4. Description of the various terms

The definitions of the following terms are based on the currently available literature. The terms are listed in alphabetical order so they can easily be found when reading the different chapters of this thesis.

1- **Affirmed Gender:** This term is becoming more common and is used to describe *transgender people* post-*transition*. This term indicates that the *gender identity* is now in line with the *gender role* and the appearance of the person.

2- **Androphylic:** A person who feels a sexual attraction to masculinity or who has a sexual interest in physically adult males.

3- **Assigned Gender:** This term is used to describe the gender that a person is assigned to when they are born, based on the genital appearance. In some people this gender may be in line with their *gender identity (*which is the case in *cisgender people),* but in others it is not.

4- **Bi-gendered**: A person who has a *gender identity* that encompasses both *binary genders*, male and female. In some case they may feel that one gender is stronger than the other. See *non-binary* definition and the specific chapter in this book for more information.

5- **Binary Gender:** This term is used to classify sex and gender into two opposite and distinct groups, masculine and feminine. In the majority of societies gender is only divided into female or male (in a *binary* way). Gradually, we are becoming aware that there are people whose *gender identity* does not fall into those two categories. This is when the term *non-binary gender* is used.

6- **Bisexuality:** Also 'bi'. A person who is attracted to two sexes or two genders, but not necessarily simultaneously or equally. This used to be defined as a person who is attracted to both genders or both sexes, but since there are not only two genders (see *transgender*), this definition is inaccurate.

7- **Bottom Surgery**: This term is used colloquially to describe gender confirmation genital surgery. See *gender confirmation genital surgery.*

8- **Chest Reconstructive Surgery:** A gender confirming surgery that involves the creation of a contoured, male-looking chest in a *transgender man*. The term "*top surgery*" is also used colloquially.

9- **Cisgender** or **Cis**: A person whose *assigned gender* is in line with their *gender identity.* Cis women and cis men (the latin cis means "same") live in and identify with the same body in which they were born.

10- **Coming out:** Recognising one's sexual orientation, or gender identity, and being open about it with oneself and with others.

11- **Cross-dress:** A verb used to describe the action of dressing using clothing of the opposite *binary gender.*

12- **Cross-dresser:** A person who cross-dresses (dresses in clothes that a society considers to be stereotypical from the opposite *binary gender).* This person does not aim to live full-time as the other gender and is happy with their *gender identity* and *assigned gender*. The older term "*transvestite*" is considered derogatory by many and should be avoided.

13- **Differences of Sex Development (DSD):** Refers to people born with a sexual anatomy and/or chromosome pattern that does not fit the typical sexual anatomy and/or chromosome pattern of male and female. In some cases, the appearance of the genitalia at birth may not be clear and the assigned gender and gender role (boy or girl) given may not be consistent with the gender identity of the person. The inconsistencies in the development of the sexual organs may be associated with atypical sex chromosomes such as Klinefelter syndrome (XXY), or Jacob's syndrome (XYY). The term *Intersex* has also been used instead of

DSD, although many people are of the opinion that DSD is a more appropriate term to use. This rgesis does not address DSD.

14- **Drag King:** A female performer who cross-dresses as a man with the sole aim of entertaining others at bars, clubs, or similar events.

15- **Drag Queen:** A male performer who cross-dresses as a woman with the sole aim of entertaining others at bars, clubs, or similar events.

16- **Family of Choice:** Persons or group of people an individual sees as significant in their life. It may include none, all, or some members of their family of origin. In addition, it may include individuals such as significant others, domestic partners, friends, and co-workers.

17- **FTM:** A person who transitions from a female assigned gender to a male gender as they identify themselves as male.

18- **Gender:** Is about three things, namely; (1) our biology (*sex chromosomes*, anatomy of the reproductive system and secondary sex characteristics); (2) *gender expression*, and (3) *gender identity*. Gender is about who someone is. There are lots of different genders. No one can tell another person how they feel on the inside.

19- **Gender Binary:** *See binary gender*

20- **Gender Confirmation Treatment (GCT):** *Transgender people* who wish to *transition* permanently to their experienced gender in order to *affirm their gender* may undergo treatment. This treatment is known as gender confirmatory or confirming treatment. GCT includes hormone treatment and gender confirming genital surgery.

21- **Gender Confirmation Surgery:** This term is used to describe the surgical procedures required in order for a *transgender* person to change their body to reflect their *gender identity*. This may include *chest reconstructive surgery*, breast augmentation surgery, *gender confirmation genital surgery* and other surgeries such as vocal cord surgery, facial surgery, and so on.

22- **Gender Confirmation Genital Surgery:** The surgical procedures required in order for a *transgender* person to change their genitals to reflect their gender identity. In the past the term *sex reassignment surgery* (SRS) has been used. The term *gender surgery* is also used. Colloquially *"bottom" surgery* can be used.

23- **Gender Dysphoria:** The distress that some transgender people feel due to the discrepancy between their assigned gender at birth and their gender identity. This distress can include high levels of disgust with their sex characteristics, as these may contradict their gender identity. The distress can also be due to the interpersonal prejudice and discrimination from society. The same term (Gender Dysphoria) is also used as a diagnosis.

24- **Gender Expression:** The way a person expresses one's *gender identity* to others. A person can express their gender through their behaviour, mannerism, clothing, hairstyle, voice or body characteristics. Some of those expressions are culturally bound, for example, outside of Western cultures, it is not uncommon for men to wear skirts and skirt-like garments; however, in North America and much of Europe, the wearing of a skirt is usually associated with being a woman. Other stereotypical gender expectations are that men should not cry and women are gentle.

25- **Gender Fluid:** A person whose gender identity varies over time. A gender fluid person may at any time identify as male, female, *neutrois*, or any other *non-binary identity* or some combination of identities. See *non-binary.*

26- **Gender Identity:** The psychological identification of oneself or the internal sense of being (the way we feel inside, in our hearts and in our minds) in relation to gender. How people feel about their gender is very personal. Only the individual knows this. Traditionally, in western societies, there is a presumption that the gender identity of a person is *binary* (male of female) and will match the assigned gender at birth. This is not always the case. Although gender identity may be powerfully influenced by the sex of the genitalia and the gender of rearing (including the *role* and *expression* of the gender), it is not solely determined by these factors.

27- **Gender Neutral,** or **Non-gender:** A person who may regard themselves as not having a gender. This is part of the *non-binary* spectrum.

28- **Gender Non-conforming:** Any individual whose *gender expression* is different from what society expects of them, due to their assigned gender at birth. See *Gender Variance* too.

29- **Gender Surgery:** See *gender confirmation genital surgery.*

30- **Gender Queer:** This term is used for people who identify themselves as neither entirely male nor entirely female. The term "non-binary" is also used. See *non-binary* for more information.

31- **Gender Recognition Certificate:** In the United Kingdom transgender people who have undergone a permanent change of social gender status can obtain legal recognition in the form of a Gender Recognition Certificate (GRC), which allows them to change their birth certificate. Obtaining a GRC does not necessarily require hormone treatment or gender confirmation surgery.

32- **Gender Role:** This term is similar to *gender expression* and is used to describe the gender social role, which is based on societal and cultural rules. There are rules in society that dictate what a man or a woman should wear, feel, and do in society. This is learned very early on, when we are children. For example, boys should not wear pink, boys should not play with dolls, girls should not climb trees, etc. In spite of the greater gender equality in some Western cultures there are still 'rules' in our society about what is appropriate for a man or a woman, a boy or a girl, especially in terms of appearance. A significant departure from those rules often causes anxiety to others, which can be reflected onto the gender nonconforming person, causing distress and *dysphoria.*

33- **Gender Variance:** This term is used to describe the fact that some people dress and/or behave in ways that are perceived by others as being outside of the cultural and societal gender expressions. Another term used to describe the same is *gender nonconformity.*

34- **Gynaephylic:** A person who feels a sexual attraction to femininity or who has a sexual interest in physically adult women.

35- **Intersex:** Refers to people born with a sexual anatomy and/or chromosome pattern that does not fit the typical sexual anatomy and/or chromosome pattern of male and female. Many people feel that DSD is a more appropriate term. See DSD for more information.

36- **MTF:** A person who transitions from the assigned gender of Male to Female as they identify themselves as female.

37- **Mx:** Is an English-language honorific for use alongside Mr, Ms, etc. that does not indicate gender. It is often the only option for non-binary people, as well as those who do not wish to reveal their gender.

38- **Neutrois:** Refers to people who consider themselves to have a neutral gender or not to have a gender. It is part of the *non-binary gender.*

39- **Non-binary Gender:** This term is used to describe people who don't see themselves as being part of the binary gender (male or female). As part of the non-binary spectrum people can identify themselves as *gender queer*, *neutrois, pan-gender, poly-gender, third gender*, etcetera. The pronouns that non-binary people often prefer is "they" and the title "*Mx*".

40- **Non-gender:** A person who considers themselves not to have a gender. It is part of the *non-binary gender*.

41- **Pan-gender:** A person who identifies oneself as having an infinite number of genders that goes beyond the knowledge we have currently about genders. It is part of the *non-binary gender*.

42- **Poly-gender:** A person who identifies oneself as having several genders, either simultaneously or not. It is part of the *non-binary gender*.

43- **Queer:** This is an umbrella term to cover people who are not heterosexual or *cisgender*. A term used to refer to lesbian, gay, bisexual and, often also transgender, people. It can have a derogatory connotation.

44- **Secondary Sex Characteristics:** Are any of a number of manifestations, such as development of breasts or beard, muscularity, distribution of fat tissue and change of pitch in voice, specific to the male and female body, starting and developing at puberty, but not essential to reproduction.

45- **Sex (1):** When a child is born, the first question that parents ask (unless they know it in advance) is whether the child is a boy or a girl. The midwife or the doctor will look at whether the child has a penis or a vagina and, based on this, they will tell them whether the baby is a boy or a girl. This is the *sex* of the baby, not the *gender*. Sex and Gender are often used interchangeably, as if they mean the same, but sex refers to the biological differences (penis or vagina) between male and female. Based on this the child will be assigned as male or female. When the child is born, the sex of the infant is based on the genitals but internal reproductive organs, physical characteristics, (musculature or fat distribution when they are older) and the brain, are all sex differentiated. And of course, the *sex chromosomes* (XX for a woman or XY for a man) will usually be related to the genitals of the person.

46- **Sex (2):** Refers to the biological characteristics that define humans as female or male. While these sets of biological characteristics are not mutually exclusive, as there are individuals who possess both, they tend to differentiate humans as males and females. In general use in many languages, the term *sex* is often used to mean "sexual activity", but for technical purposes in the context of sexuality and sexual health discussions, the above definition is preferred.

47- **Sex Chromosomes:** Either of a pair of chromosomes, usually designated X or

Y, that combine to determine the sex and sex-linked characteristics of an individual, with XX resulting in a female and XY in a male.

48- **Sexual Orientation:** Is an enduring pattern of romantic or sexual attraction (or a combination of these) to persons of the opposite sex or gender, the same sex or gender, or to both sexes or more than one gender.

49- **Sex Reassignment Surgery:** See *gender confirmation genital surgery*.

50- **Top Surgery:** This term may be used colloquially to describe *chest reconstructive surgery*. See *chest reconstructive surgery*.

51- **Third Gender:** A person who is not considered by themselves or others to be male or female. Some societies have recognized the existence of a third gender. A third gender in those cultures represents an intermediate state between man and woman, a state of being both, or neither. The term "third gender" has gained legal identity in India, Bangladesh and Pakistan.

52- **Trans:** See *Transgender*

53- **Transgender:** This term has been used as the most inclusive umbrella term to include anyone who is not *Cis*. In other words, the asterisk used at the end of *transgender* indicates inclusion of all nonconforming (gender queer) groups and includes non-binary people who self-describe or self-identify in a number of ways (e.g., as pangender, polygender, bigender, neutrois, and so on).

54- **Transgender:** An umbrella term to describe anyone whose gender identity, expression or behaviour is different from the assigned gender at birth based on the sexual characteristics. The term *Trans* is also used as an abbreviation for transgender.

55- **Transgenderism:** Refers to a state or condition in which a person's identity does not conform unambiguously to conventional ideas of male or female gender. Many trans people object to this term, as it constitutes an '-ism'.

56- **Transgender Man:** A person who was assigned a female gender at birth based on their sexual characteristics, but who identifies as male.

57- **Transgender Woman:** A person who was assigned a male gender at birth based on their sexual characteristics but who identifies as female.

58- **Transsexual:** The term transsexual (as an adjective) has been used since 1949 to refer to people who had a clear sense of being "[born] in the wrong body" (Cauldwell, 1949). This term is largely confined to legislation and to medical literature. As the terms '*transsexual*' and '*transsexualism*' are and have been used as a diagnosis in the *International Classification of Diseases and Health Related Problems* (ICD-10; WHO) and in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III: APA), they are thought to pathologize transgender people. The terms '*transsexual*' and *'transsexualism'* are often considered old-fashioned and stigmatizing, and this terminology is increasingly being replaced with terms, such as '*transgende*r' and '*trans*', which many people deem more acceptable. Language is political and depends on place, time, and sometimes, age group. Older trans people seem more inclined to use "transsexual," and to distinguish between this binary identity and other non-binary or intermittent gender expressions. Also, after physically transitioning, many transsexual people consider themselves men or women and no longer identify as a transsexual person.

59- Transvestite: This is a medical term, which has been used to describe a person who cross-dresses (dresses in clothes that a society considers to be stereotypical from the opposite *binary gender).* This person generally does not aim to live full time as the other gender. This is an old term, which is not used as it is considered derogatory by many people. See *cross-dresser.*

60- Transition: Is the process of changing one's gender presentation permanently to accord with one's internal sense of one's gender. It is usually the time when a person begins to live as their experienced gender. This can take the form of social transition (by coming out to people, asking them to use the right pronoun and name, changing the name legally, changing the way one looks, etcetera). Transitioning may or may not include *gender confirming medical treatment.*

I want to conclude this chapter by making a number of final remarks. In order to encompass the largest population of gender variant individuals, the broader term 'transgender' will be used to refer to persons who wish to be socially recognized as a gender distinct from their assigned sex, with or without the desire for body modification. For reasons of order and containment, the content of this thesis is limited to populations—however inconsistently defined—that have either transitioned from one gender to another or who present with a desire to do so. The first paper (study 1) in chapter 6 specifically investigates the prevalence of the narrowly defined diagnosis *Transsexualism*, whilst study 2 in chapter 6 investigates populations with a diagnosis of *Transsexualism.* The other 3 papers, however, move away from using a specific diagnosis and define populations of transgender people based on self-identification, their gender assigned at birth or natal sex (study 3).

I have aimed to be as consistent and comprehensive as possible with the use of language and terminology. However, as the papers published in this thesis have been written over a period of a number of years, there is no firm consistency in the use of language and terminology for which I apologise in advance. In a similar vein, it is highly likely that by the time this thesis is published, another term or set of terms may have emerged, rendering those described in this chapter irrelevant or even politically incorrect (Arcelus & Bouman, 2017; Bouman, Suess Schwend, Motmans, Smiley et al., 2017).

CHAPTER 3. TREATMENT PATHWAYS FOR PEOPLE WITH GENDER DYSPHORIA IN THE UNITED KINGDOM

3.1. Introduction

The number of people with gender dysphoria who seek assessment, support and treatment at transgender health services has increased substantially over the years in Europe and North-America (Aitken et al., 2015; de Vries et al., 2015). There is also a significant increase in people who self-diagnose as having gender dysphoria. Two recent population studies have aimed to estimate the prevalence of people who identify as such. Kuyper & Wijsen (2014) examined self-reported gender identity and dysphoria in a large Dutch population sample (N=8,064, aged 15-70 years old), and found that 4.6% of people assigned male at birth and 3.2% of people assigned female at birth reported an 'ambivalent gender identity' (defined as equal identification with other sex as with sex assigned at birth) and 1.1% of people assigned male at birth and 0.8% of people assigned female at birth reported an 'incongruent gender identity' (defined as stronger identification with other sex as with sex assigned at birth). Similarly, Van Caenegem et al. (2015) reported results based on two population-based surveys, one of 1,832 Flemish persons and one of 2,472 sexual minority individuals in Flanders, Belgium examining the prevalence of 'gender ambivalence' and 'gender incongruence'. In the general population, gender ambivalence was present in 2.2% of male and 1.9% of female participants, whereas gender incongruence was found in 0.7% of men and 0.6% of women. In sexual minority individuals, the prevalence of gender ambivalence and gender incongruence was 1.8% and 0.9% in men and 4.1% and 2.1% in women, respectively.

The increase in prevalence of gender dysphoria (and gender incongruence) in the last decade is likely due to a number of interactively linked factors: the increased visibility of transgender people on television and in cinema, such as for instance Caitlyn Jenner, Transparent, and The Danish Girl. Their screening make being transgender enter societal conscience as an increasingly mainstream phenomenon and is likely to contribute to at least a partial de-stigmatization of being transgender; the wide availability of information on the Internet and other communication channels about gender dysphoria and gender incongruence, which also likely contributes to de-stigmatization; the increased awareness of the availability of biomedical treatment (Coleman, Bockting, Botzer, Cohen-Kettenis, De Cuypere et al., 2012; Wylie, Barrett, Besser, Bouman, Bridgman et al., 2014); and the development of societal tolerance towards transgender individuals (FRA, 2014; Keuzenkamp & Kuyper, 2013). Moreover, as being transgender enters societal conscience more people will reflect on their assigned, experienced and felt gender, and some may feel an incongruence and therefore possibly question their assigned cisgender status, which had previously always been taken for granted (Bouman, de Vries, & T'Sjoen, 2016a,b).

The percentages of people reporting ambivalence and incongruence with their gender identity in the aforementioned population studies are simply staggering. It also highlights the existence of people who explicitly identify as non-binary, that is, those people who identify and/or present in a way, which is outside the gender dichotomy of man/woman (Richards, Bouman, Seal, Barker, Nieder et al., 2016; Richards, Bouman, & Barker, 2017). It remains unclear how many people will seek assessment and treatment at transgender health services. Nevertheless, many transgender individuals require clinical services as they wish and decide to have cross-sex hormone treatment and surgery to alleviate their gender dysphoria. Some people may feel that a certain treatment is necessary for them (Beek, Kreukels, Cohen-Kettenis, & Steensma, 2015), whilst others do not feel the need to feminize or masculinize their body; for those changes in social gender role and expression can be sufficient to alleviate gender dysphoria and gender incongruence. Moreover, many transgender individuals may have socially transitioned with or without various treatment(s) through private means.

We should not underestimate the significance of the increase in prevalence of gender dysphoria, which is likely to indicate the level of further future demand for clinical services. In many countries there are no adequate services for transgender people, whilst in others, such as the United Kingdom, where all care and treatment is free at the point of access, transgender health services have been chronically underfunded, with waiting lists for a first appointment and access to cross-sex hormone treatment and gender confirming surgeries excessively long. Prompt access to care and treatment of seamless and interdisciplinary transgender health services for people of all ages are paramount. Clinicians must treat transgender people like any other people; there is no justification to obstruct access to care (Bouman, Richards, Addinall, Arango de Montis, Arcelus et al., 2014; Richards, Arcelus, Barrett, Bouman, Lenihan et al., 2015).

3.2. Who is it appropriate to refer to adult transgender health services?

Within the National Health Service (NHS) in the UK, healthcare providers may be primary (the General Practitioner (GP)) or secondary (specialist services accepting referrals from the GP), such as the local mental health team and transgender health services. So, transgender health services are secondary services and, as such, receive the vast majority of referrals from primary care, although secondary services, such as local mental health services do also refer. This is because until 5 years ago, all transgender patients seeking referral to transgender health services were required to undergo a psychiatric assessment before referral.

Referrals to transgender health services should be on the basis of the patient's reported history of gender discomfort, including a full description of the nature and extent of any coexisting mental and physical health diagnoses, if present. The following may all coexist with Gender Dysphoria, and are not considered contraindications to referral: disorders of mental or physical health, disorders of learning, development (including autistic spectrum) or personality, dependence on alcohol or other substances. It is the responsibility of the referrer to ensure that any such conditions are stabilised. Where there are significant elements of associated risk, these should be well managed by referrers and additional (including forensic) services involved as appropriate (Ahmad, Barrett, Beaini, Bouman, Davies et al., 2013). It is recommended that any clinically significant medical or mental health concerns are stabilised before physiological treatments are initiated. It is recognised, however, that some health concerns arise from the stress of dysphoria or transition and commonly diminish or disappear altogether with successful addressing and management of the Gender Dysphoria itself (Arcelus & DeCuypere, 2017; Dhejne, Van Vlerken, Heylens, & Arcelus, 2016).

Individuals referred to a transgender health service are not required to have started living in their desired social gender role, and it is not necessary for them to have undertaken psychotherapy prior to referral. Equally, some people will already have taken steps in this direction before approaching their GP, including full social gender transition and obtaining cross-sex hormone treatment privately or via the Internet (Mepham, Bouman, Arcelus, Hayter, Wylie, 2014).

3.3. The role of primary care

Transgender people are usually required to present to general practitioners (GPs) before they can access transgender health services. The first disclosure to a health professional can be incredibly important for the transgender patient and it is important that health professionals have a basic understanding of transgender issues and know where to refer their transgender patients. Often transgender patients will have been thinking about their gender and treatment for a considerable length of time and seek help at a time when they feel ready to move forward with treatment (Murjan & T'Sjoen, 2017). Treatment may consist of psychological support, cross-sex hormones and gender confirming surgeries.

General Practitioners can affirm their patients' gender identities by acceptance of their stated identity and use of names and pronouns as requested by the patient. If the practitioner is in doubt then it is respectful and helpful to ask how the patient wishes to be addressed. If the patient has made a formal change of name and gender then their records need to be updated but if not, preferred name and pronouns can be highlighted in the records (Murjan & T'Sjoen, 2017).

An individual General Practitioner may have had had no prior experience of treating a transgender patient. They are also unlikely to have had any specific training in this area. However, they are well placed to make an initial assessment taking into account the physical health needs of their patient. Transgender people often prefer their treatment to take place in their local community in mainstream services, which are seen as not stigmatizing of the transgender patient. It should be remembered that many patients will undergo treatment that will need to be maintained for the rest of their lives and many do not want to be attending specialist transgender health services long after their transition and want to be treated as ordinary men and women rather than transgender men and women. As transgender people often have to travel some distance to access specialist transgender health services, they will want to access local care when possible to avoid unnecessary disruption to their lives (Murjan & T'Sjoen, 2017).

Whilst being transgender is not a mental illness and not associated with major mental illness, trans people may present with distress, self-harm, anxiety and depression (Arcelus & DeCuypere, 2017; Marshall, Claes, Bouman, Witcomb, & Arcelus, 2016; Millet, Longworth, & Arcelus, 2017). This is commonly related to marginalisation or minority stress (Meyer, 1995; 2003). There may be anxiety in relation to social gender role transition, disclosure to family, friends and work, as well as access to desired physical treatments. These may need treatment with medication such as antidepressants and/or with psychological approaches. The latter are often best provided locally through mainstream clinical services. Practitioners unfamiliar with treating transgender individuals may seek training and support from specialist transgender health services, but generally usual principles can be applied as to any people undergoing difficult social circumstances or change (Murjan & T'Sjoen, 2017).

Many transgender people approaching their general practitioners may be self-prescribing with hormones obtained from various sources including the Internet. Many transgender people are unaware of the risks or the appropriate preparations, doses and monitoring required (Mepham, Bouman, Arcelus, Hayter, & Wylie, 2014). They may not have given due consideration to issues such as loss of fertility and they may not be aware of the risks such as smoking on hormone therapy. Smoking not only increases the risk of thromboembolism i.e. deep vein thrombosis (DVT) and pulmonary embolism (PE) for patients on oestrogens, it also increases the risk of polycythaemia and stroke in patients on testosterone therapy (Seal, 2017). The GP can play an important role in health promotion, advice and risk reduction.

After assessment at the transgender health service, the GP is responsible for the initiation and ongoing prescribing of cross-sex hormone treatment and organising blood and other diagnostic tests as recommended by the specialist gender clinician. In the longer term, primary care is responsible for the life-long maintenance of their patient's well-being. This involves conducting simple monitoring tests, examinations and medication reviews as recommended, initially by the discharging gender specialist, and thereafter according to extant best practice. The GP is also responsible for making appropriate changes to patient record systems to reflect the patient's desired gender role and to ensure that such changes facilitate screening for physiologically appropriate risks. For transgender female patients, this includes a theoretical risk of breast and prostate cancer, but not cervical cancer. For transgender male patients, the GP should arrange for a suitably dignified gynaecological examination according to the patient's genital physiology. All such arrangements should take into consideration the need to ensure that the patients' gender histories are not disclosed (directly or indirectly) to third parties, in part because such disclosure can represent a criminal offence (Great Britain, 2004). Diligently kept and universally consistent records should minimise the risk of disclosure, but also of inadvertently addressing or referring to the patient inappropriately (Ahmad, Barrett, Beaini, Bouman, Davies et al., 2013).

3.4. The role of transgender health services

Anyone referred to a transgender health service will be assessed to confirm a diagnosis of or relating to Gender Dysphoria. A diagnosis is medical shorthand for a particular combination of symptoms (what the individual reports) and signs (what the clinician observes). In the United Kingdom, diagnoses are generally coded according to version 10 of the International Classification of Diseases (ICD-10) (WHO, 1992). The most common gender-related diagnosis is Transsexualism (F64.0). Some clinicians might also refer to the USA equivalent of ICD-10, the fifth edition of the Diagnostic and Statistical Manual (DSM-5), which uses the term Gender Dysphoria as a diagnosis for people who experience discomfort or distress about their assigned gender (APA, 2013).

The roles of the mental health professional are outlined in the World Professional Association of Transgender Health's and the United Kingdom's Standards of Care (Coleman et al., 2012; Wylie et al., 2014). The assessment of an individual presenting with symptoms of gender dysphoria requires careful gathering of information relating to gender and sexual development as well as exclusion of major mental illness that might be presenting as Gender Dysphoria. The latter is uncommon, but might include someone with a psychotic disorder such as schizophrenia, who holds delusional beliefs about their gender or body. Other examples might be someone with a severe personality disorder in which there is severe disturbance of identity or dysmorphophobia, which can be directed towards, for example, the genitals. There is no evidence to suggest that these conditions occur any more commonly in transgender people than in cisgender people, but nonetheless they are important to identify to avoid mistreatment. In those with a history of gender dysphoria, there needs to be an assessment of co-existing mental health issues. High rates of anxiety and depression, deliberate self-harm and suicidality have been reported (Bouman, Claes, Brewin, Crawford, Millet et al., 2017; Claes, Bouman, Witcomb, Thurston, Fernandez-Aranda et al., 2015; Haas, Eliason, Mays, Mathy, Cochran et al., 2013) which have been linked to gender-based discrimination and victimization (Claes, Bouman, Witcomb, Thurston, Fernandez-Aranda, & Arcelus, 2015; Clements-Nolle, Marx, & Katz, 2006). Similarly, transgender people present with higher levels of body dissatisfaction (which is not only related to their sex assigned at birth) and appear to be at a higher risk of developing maladaptive eating behaviours than cisgender people (Arcelus, Fernandez-Aranda, & Bouman, 2017; Bouman & Arcelus, 2016). Autistic spectrum disorders have been found to be over represented amongst children, adolescents and adults with gender dysphoria (De Vries, Noens & Cohen-Kettenis, 2010; Glidden, Bouman, Jones, & Arcelus, 2016; Parkes, Barrett, Beail, Bhasin, Bouman et al., 2016; Van der Miesen, Hurley, & De Vries, 2016), although the relationship is far from clear. When assessing a trans person with significant issues such as schizophrenia, bipolar affective disorder or even learning difficulties, issues to consider might be the stability of the gender identity and gender expression and the individual's ability to understand the treatment and give informed consent.

Generally treatment follows the principle of more reversible treatment followed by progressively more irreversible treatments and thus one would usually start with living in the desired gender role before starting hormones to effect the secondary sex characteristics of the preferred sex, and only after that considering sex reassignment surgeries such as breast removal (chest reconstructive surgery); breast enlargement (augmentation mammoplasty); the removal of reproductive capability (hysterectomy; salpingo-oophorectomy; orchidectomy); and the creation of a penis or vagina through genital reconstructive surgeries (GRS - phalloplasty; vaginoplasty) (Murjan & Bouman, 2015).

3.5. Transgender health services: initial assessment

Commonly, assessment takes place over at least two appointments, usually with two separate clinicians, effectively forming parts of a whole. Sometimes, individuals with complex circumstances or with a history of having de-transitioned (returned to a gender role in accordance with their birth sex) will require further assessment. Sometimes, as in the case of individuals who were previously known to the transgender health service or to other transgender health services, a second appointment may not be necessary in identifying and addressing their specific needs. Typically, there is an intervening gap between initial appointments, to allow for reflection and, if appropriate, initiation or consolidation of a social gender role change, interpretation of the results of blood and other investigations, etcetera. Ideally, there should be no more than four months between appointments (Ahmad, Barrett, Beaini, Bouman, Davies et al., 2013).

3.6. Blood tests

If required, routine blood tests are carried out after the first appointment, by the GP. The transgender health service should inform the GP if this is necessary. These blood tests typically consist of the following: Full Blood Count, Urea &Electrolytes, Creatinine, Liver Function Tests, Lipids including Cholesterol, Oestradiol, LH, FSH, SHBG, testosterone, prolactin, and prostate specific antigen (for transgender women older than 50 years). It is important for the transgender health service to review results of blood tests (preferably with the assistance of a specialist endocrinologist) before initiating cross-sex hormone treatment (Seal, 2017).

3.7. Smoking

Smokers are advised to stop. This is to minimise the overall risk of thrombo-embolism and polycythaemia, which are increased by oestrogens and testosterone, respectively. Moreover, surgical complications are significantly increased, and most surgeons expect patients to stop smoking before and after surgery to increase the quality of wound healing (Christopher, Ralph, & Garaffa, 2017; Selvaggi & Andreasson, 2017). Smoking is strongly discouraged and assistance to stop is offered via primary care services. As a general rule, hormones are not initiated, or hormone dosage increased, or surgery performed while the individual continues to smoke, though hormone replacements such as nicotine patches, gum or electronic cigarettes are acceptable.

3.8. Obesity

Obese individuals are advised that their weight increases thrombo-embolic and surgical risks, and may indeed prove a contraindication to surgery. They are encouraged at an early stage to lose weight. Most surgeons impose weight criteria expecting a Body Mass Index (BMI) between 18 and 30, before surgery can be carried out (Christopher, Ralph, & Garaffa, 2017; Selvaggi & Andreasson, 2017).

3.9. Official name change

If an official name change has not been made, the individual should be advised on how to go about this. It is possible for people of British nationality to make an official name change any time. An information sheet from the Gender Recognition Panel (GRP, 2012) sets out three ways of doing so. Sometimes it is not possible for people to make an official name change. Non-UK nationals, for example, may be unable to change their name in their country of origin and this should be taken into account by the gender specialist clinician. Clinicians may seek to confirm name change by asking to see relevant documentation.

3.10. Hormones

As a general rule, the prescription of exogenous hormones (oestrogens, androgens) is not endorsed until initial assessment is completed. This will take more than one appointment unless the individual is transferring from an appropriate child and adolescent or other gender service, or has showed documentary evidence of social gender role change for a significant period of time. If the individual is already taking hormones (having been started by a private gender specialist or through self-medication), it is generally not stipulated that they stop altogether, as there is emerging evidence that self-medication leads to better outcomes from a mental health perspective (Bouman, Claes, Marshall, Pinner, Longworth et al., 2016; Bouman, Claes, Brewin, Crawford, Millet et al., 2017). The focus is rather on safe use of hormones, and blood investigations inform this. If someone is taking doses or combinations that represent a risk, they will be advised of this and appropriate guidance given. Dependent on whether an individual has socially transitioned in the sense of living full time in their desired gender role (or is felt by the specialist gender clinician to be likely to do so imminently), it may be reasonable to recommend that the GP prescribe cross-sex hormones – oestrogen for transgender women and testosterone for transgender men – possibly in combination with a GnRH analogue (A gonadotropin-releasing hormone analogue is a synthetic peptide drug modeled after the human hypothalamic gonadotropin-releasing hormone. They work by temporarily "switching off" the ovaries in cisgender females. "Switching off" the ovaries can delay puberty in transgender youth. A more striking aspect of this therapy is the regression of secondary sexual characteristics and cessation of menstrual bleeding. GnRH analogues are also used to suppress testosterone levels in transgender women to ensure optimum feminization. The effects of therapy usually reverse when treatment is discontinued).

Important issues such as the storage of reproductive capacity i.e. sperm or ova/oocytes, should be considered before hormone prescribing as fertility will be lost, which may be irreversible even if the person stops hormone treatment (De Roo, Tillemans, & De Sutter, 2017; Seal, 2017). This may be more of an issue for younger people who may have difficulty considering these issues especially if their dysphoria is intense and the drive to start treatment as soon as possible is overwhelming.

Hormone treatment induces secondary sexual characteristics of the desired gender. Some of these effects are irreversible or partially irreversible (Gooren, 2017; Seal, 2017). In transgender men, irreversible effects include clitoral growth, voice deepening, male pattern baldness in those susceptible, increased body hair and facial hair development. In transgender women they include breast development. It is also useful to discuss the rationale for starting on a low dose of oestrogens and increasing in staged increments as this appears to lead to better outcomes in terms of breast growth (Hembree et al., 2009).

3.11. Other recommendations

If appropriate, the gender service clinician might make a referral to Speech and Language Therapy, either local or based at the gender service to the individual. Referral will usually depend on people having begun living full-time in their preferred gender role, as it is very difficult to practise the new vocal techniques consistently if switching between social gender roles (Antoni, 2017). Transgender women are entitled to facial hair removal by laser or electrolysis, which is more effective when testosterone levels are adequately suppressed.

3.12. Transgender health services: ongoing assessments

People are required to attend the transgender health service regularly (ideally, at least three times yearly) for review with one or more specialist gender clinicians. This might reasonably include: discussion of hormones; referrals to other services (for example, psychology, speech therapy, electrolysis providers, surgery, etcetera); support as necessary with social, occupational, family/relationship changes and other life event developments.

3.13. Transgender health services: surgical eligibility

Sometimes, when an individual first comes to a transgender health service having already lived in their preferred gender role for the requisite length of time, suitability for genital surgery might reasonably be considered. It is important to establish an understanding of surgical technique, a good understanding of risks and complications and realistic expectations of outcome. There is no set requirement for people to undergo surgical procedures in a particular pattern or order or, indeed, at all (Ahmad, Barrett, Beaini, Bouman, Davies et al., 2013). The following are, however, commonly requested.

3.14. Genderconfirming surgery for trans females

Social gender role transition is usually considered to have started from the point that the individual makes an official name change – assuming they have also established a changed social gender role. It is standard practice for people to be considered eligible for genital reconstructive surgery (vaginoplasty surgery) after a set period (usually, one year to 18 months) of social gender role transition in accordance with the UK Standards of Care (Wylie, Barrett, Besser, Bouman, Bridgman et al., 2014). This means living full-time as a woman, including official name change and documentary evidence of some sort of social occupational role, which may include paid or voluntary work or some educational endeavor. Some flexibility should be allowed to accommodate particular personal situations such as disability and for those with unusual occupations. Patients might reasonably be referred to specialist ear, nose & throat (ENT) surgeons after a year or so of living as a woman for phonosurgery (vocal cord surgery). ENT surgeons require both psychological/psychiatric and speech and language therapist (SLT) referral, so it is important to ensure that those pursuing phonosurgery have actively engaged with and are supported by an SLT, before and after surgery (Antoni, 2017). Facial feminisation at the present time, is not, generally speaking, funded within the NHS. It is not uncommon transgender women, in particular, to have undergone (or plan to undergo) facial feminising procedures in the private sector (Altman, 2017). Breast augmentation surgery is generally not funded within the NHS for those women who have very little breast development following at least one year of cross-sex hormone treatment (Yelland, 2017). A cricothyroid shave to reduce the 'Adam's apple' is also not funded within the NHS.

3.15. Genderconfirming surgery for trans males

In essence, the same eligibility requirements pertain as with genital reconstructive surgery for transgender women. A set period of social gender role transition, living full-time as a man, including proof of a social occupational role for at least 12 months. Genital reconstructive surgeries vary, but can be multi-stage (as is the case of phalloplasty surgery), with several separate surgical procedures over a period of one to two years (Christopher, Ralph, & Garaffa, 2017). Transgender men are eligible for this after having lived as a man and taken androgens for at least six months (Yelland, 2017).

The results of surgery are generally good with many studies indicating satisfaction, very low rates of regret, improved sexual and relationship functioning and improved quality of life (DeCuypere et al., 2005; Elaut, Weyers, Hoebeke, Stockman & Monstrey, 2017; Gijs & Brewaeys, 2007).

Despite good results of surgery, long-term follow-up of transgender women and men have found higher rates of mental health problems and suicide than in the general population after surgery (Dhejne, et al. 2011) which reinforces the vital role of the mental health professional in the care of transgender people.

3.16. Transgender health services: aftercare

Patients are discharged from transgender health services in the following circumstances: they have a stable gender identity in which they feel content; following endocrine and/or surgical interventions, their care can be transferred wholly to their GP; they request discharge; they fail to attend appointments; they are repeatedly unable to engage constructively with clinical services (Ahmad, Barrett, Beaini, Bouman, Davies et al., 2013). Upon discharge, the transgender health service will provide detailed recommendations and guidance to enable GPs to take full responsibility thereafter. This generally includes the advice that hormone treatment should be continued indefinitely to prevent osteoporosis with annual blood investigations including Full Blood Count, Liver Function Tests, Lipids and Cholesterol, Prolactin, Oestradiol/Testosterone and blood pressure measurement; annual PSA prostate cancer checks for those transgender women who started treatment later in life; routine breast screening; pelvic ultrasound scanning is recommended every two years, to exclude uterine/ovarian pathology for those transgender men who have not undergone hysterectomy; if individuals have retained a cervix, routine cervical screening is recommended.

It is the responsibility of the GP to monitor and manage the ongoing healthcare of transgender patients in exactly the same way as they would look after any other patient.

It is important to remember that trans people can become ill both mentally and physically, just as a cisgender person might. It is tempting for the inexperienced clinician to unduly attribute illness to the patient being trans and to give the trans identity undue attention when it is not relevant (Murjan & T'Sjoen, 2017). Moreover, it must not be assumed that relatively commonplace conditions (such as a urinary tract infection, brief depressive episode or even development of cancer) automatically necessitate re-referral to transgender health services. When making referrals to other clinical services, GPs should take care not to disclose the gender history unless it is relevant and appropriate to do so (Ahmad, Barrett, Beaini, Bouman, Davies et al., 2013).

CHAPTER 4. AIMS AND HYPOTHESES

4.1. *General Aims*

1) **To establish a meta-analytical prevalence for transsexualism**

Hypothesis: It is hypothesized that there is a higher meta-analytical prevalence of trans women compared to trans men.

2) **To identify the levels and nature of body dissatisfaction among transgender people**

Hypothesis: It is hypothesized that transgender people will present with high levels of body dissatisfaction.

3) **To investigate rates of Non-Suicidal Self-Injury (NSSI) in young trans individuals**

Hypothesis: It is hypothesized that NSSI will be higher than the prevalence reported in the general population.

4) **To describe the socio-demographic and clinical features of transgender people over the age of 50 years**

Hypothesis: It is hypothesized that the vast majority of older transgender people are transgender females, who have low levels of NSSI, and take cross-sex hormone treatment prior to referral to a transgender health service.

5) **To study levels of anxiety disorder in a non-treated transgender population**

Hypothesis: It is hypothesized that levels of anxiety will be higher in the transgender population compared to the general population.

4.2. *Specific Aims*

1) **To critically review the studies investigating prevalence of transsexualism and to report the meta-analytical prevalence for**

transsexualism based on previous studies

Hypothesis: Due to the nature of the study, no hypothesis is required.

2) **To establish a time series analysis of the available prevalence studies in transsexualism**

Hypothesis: It is hypothesized that there will be a clear increase in the prevalence of individuals diagnosed with transsexualism over time.

3) **To assess eating psychopathology, body dissatisfaction, and gender differences across a group of transgender people, and to compare the findings with those with a diagnosed eating disorder, and a cisgender, healthy control group**

Hypothesis: It is hypothesized that transgender individuals will have both a higher drive for thinness and a higher body dissatisfaction than healthy controls, but that this will be lower than seen in people with an eating disorder.

4) **To identify the nature of body dissatisfaction among transgender people by investigating the specific body parts (e.g. genitals, voice, head, body shape) that cause discomfort**

Hypothesis: It is hypothesized that specific gender identifying body parts, such as genitals, voice, head, body shape) will cause the greatest dissatisfaction.

5) **To investigate rates of Non-Suicidal Self-Injury (NSSI) in young trans individuals and compare this to previously reported prevalence rates in the general population**

Hypothesis: It is hypothesized that the levels of NSSI in this population will be higher than previously reported in the general population. No clear hypothesis regarding the prevalence according to gender in this transgender population is made.

6) **To identify risk factors for Non-Suicidal Self-Injury in young trans individuals**

Hypothesis: It is hypothesized that risk factors for NSSI constitute of victimization (transphobia experience), low self-esteem, lack of social support, high levels of psychopathology and lack of cross-sex hormone treatment.

7) **To compare levels of psychopathology between transgender people over the age of 50 years who are using cross-sex hormone treatment prior to referral to a transgender health service with those who did not**

Hypothesis: It is hypothesized that the use of cross-sex hormone treatment will be more prevalent in transgender females and associated with less anxiety and depression, lower NSSI and discrimination, and increased self-esteem, social support and interpersonal functioning.

8) **To compare levels of anxiety disorders among transgender people, not in treatment and to compare them to a matched controlled (by age and gender) general population sample**

Hypothesis: It is hypothesized that levels of anxiety will be higher in the transgender population compared to the general population.

9) **To investigate the predictive role of specific variables, including experienced gender, self-esteem, victimization, social support, interpersonal functioning and cross-sex hormone use regarding levels of anxiety symptomatology in a non-treated transgender population**

Hypothesis: It is hypothesized that assigned female gender at birth, low self-esteem, victimization, lack of social support and lack of cross-sex hormone treatment and poor interpersonal functioning are significant predictors of anxiety symptoms in non-treated transgender people.

10) **To investigate differences in anxiety symptomatology between transgender people on cross-sex hormone treatment and those who are not**

Hypothesis: It is hypothesized that the use of cross-sex hormone treatment will be associated with less anxiety.

4.3. Articles included in the thesis

In order to assess the hypotheses, the following studies were conducted:
Study 1: Arcelus, J., Bouman, W.P., Witcomb, G.L., Van den Noortgate, W., Claes, L., & Fernandez-Aranda, F. (2015). Systematic review and meta-analysis of prevalence studies in transsexualism. *European Psychiatry*, 30(6), 807-815.

Study 2: Witcomb, G.L., Bouman, W.P., Brewin, N., Richards, C., Fernandez-Aranda, F., & Arcelus, J. (2015). Body image and eating disorders psychopathology in trans individuals: A matched control study. *European Eating Disorders Review*, 23, 287-293.

Study 3: Arcelus, J., Claes, L., Witcomb, G.L., Marshall, E., & Bouman, WP. (2016). Risk Factors for Non Suicidal Self Injury among Trans Youth. *Journal of Sexual Medicine,* 13(3), 402-412.

Study 4: Bouman, W.P., Claes, L., Marshall, E., Pinner, G.T., Longworth, J., Maddox, V., Witcomb, G., Jimenez-Murcia, S., Fernandez-Aranda, F., & Arcelus, J. (2016). Socio-demographic variables, Clinical Features and the Role of Pre-assessment Cross-Sex Hormones in older trans people. *Journal of Sexual Medicine*, 13(4), 711-719.

Study 5: Bouman, W.P., Claes, L., Brewin, N., Crawford, J.R., Millet, N., Fernandez-Aranda, F., & Arcelus, J. (2017). Transgender and anxiety: A comparative study between transgender people and the general population. *International Journal of Transgenderism*, 18(1), 16-27.

CHAPTER 5. METHODS

5.1. Participants

The participants of the Studies 2-5 included in this thesis consisted of individuals who completed the assessment process at the Nottingham Centre for Gender Dysphoria in Nottingham, United Kingdom. Prior to appointment patients are sent a questionnaire pack as part of their clinical assessment, which patients are asked to fill out and return by pre-addressed and stamped envelope. The questionnaire pack consists of questions regarding demographic data, disclosure of gender dysphoria and social gender role transition, experiences of trans phobia and the following questionnaires: SCL-90-R (Derogatis, 1977), SF-36v2 (Ware, 1993; Ware et al., 2000), RSE (Crandal,1973; Rosenberg, 1965), HDBS (Appelt & Strauss, 1988), EDI-2 (Garner, 1991), MSPSS (Zimet et al., 1988; Zimet et al., 1990), IIP-32 (Barkham et al., 1996), AQ-short (Hoekstra et al., 2011), HADS (Zigmond & Snaith, 1983), and SIQ-TR (Claes & Vandereycken, 2007). Participants with eating disorders were recruited from a clinical database of the Leicestershire Eating Disorders Service in Leicester, United Kingdom (Study 2). The control group for Study 2 was recruited from an ongoing database at Loughborough University, Loughborough, United Kingdom, and the control group for Study 5 was recruited from an ongoing database at the Department of Psychology of Aberdeen University, Aberdeen, United Kingdom.

Ethical approval for the studies was awarded by the National Health service (NHS) research ethics committee. In addition, collection of data from each group was approved by the relevant research and development departments; the Nottinghamshire Healthcare NHS Foundation Trust for the transgender participants and Leicestershire Partnership NHS Trust for the eating disorders participants. Recruitment of control participants was approved by the Loughborough University Ethics Committee and by the Psychology Ethics Committee of the University of Aberdeen, respectively. The studies were conducted in accordance with the Declaration of Helsinki.

5.2. Measurements

The questionnaire pack consists of questions regarding demographic data, disclosure of gender dysphoria and social gender role transition, experiences of trans phobia and the following questionnaires:

Self-esteem-related questionnaires - **RSE** (Crandal,1973; Rosenberg, 1965)

The Rosenberg Self-Esteem Scale (RSE) is a self- report measure of global self-esteem. Items are rated on a four-point rating scale ranging from 0 ("strongly disagree") to 3 ("strongly agree"). Ten items produce a global score, which is considered in the normal range when between 15 and 25. A global score lower than 15 indicates low self-esteem. The RSE has been empirically validated (Robins, Hendin, & Trzesniewski, 2001) and administered previously to transgender individuals (Skrapec & MacKenzie, 1981; Vocks, Stahn, Loenser, & Legenbauer, 2009).

Body image-related questionnaires - **EDI-2** (Garner, 1991)

The Eating Disorder Inventory-2 is a self-report questionnaire used to assess the presence of psychological and behavioural traits of eating disorders. It consists of 11 subscales; three measure eating-related symptoms and the remainder measure psychological disturbances, characteristic of those with clinical eating disorders, for example, interpersonal distrust, fear of maturity and perfectionism. The three subscales that measure eating-related behaviours were used in Study 3. These were as follows: (1) drive for thinness—seven questions that assess the extent to which an individual exhibits an excessive concern with dieting, preoccupation with weight and fear of weight gain (for example, 'I am terrified of gaining weight'); (2) bulimia—seven questions that assess whether and how often an individual reports episodes of binge eating and purging (for example, 'I have gone on eating binges where I felt that I could not stop'); and (3) body dissatisfaction—nine questions that assess the extent to which an individual is not satisfied with their physical appearance (for example, 'I feel satisfied with the shape of my body'). Responses are made using a 6-point scale from 'never', 'rarely', 'sometimes', 'often', 'usually' to 'always'. This questionnaire has been used widely in the literature and has been validated in the USA (Garner, 1991).

HDBS (Appelt & Strauss, 1988)

The Hamburg Body Drawing Scale (HBDS) is a pictorial measure that asks participants to indicate how (dis)satisfied they are with specific parts of their body. Thirty-three different body characteristics (e.g., voice, skin, arms, chest, or breasts) are identified on a body drawing and participants are asked to rate each on a five-point Likert scale ranging from 1 ("very satisfied") to 5 ("very dissatisfied"). In addition, they are asked to give a rating for their overall whole body (dis)satisfaction and "other," if applicable. The HBDS was purposely developed for use within transgender populations and has been used widely in transgender research (e.g. Kreukels et al., 2012; Becker et al., 2016)

Social support related questionnaires - **MSPSS** (Zimet et al., 1988; Zimet et al., 1990)
The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item, self-report scale designed to tap social support from family, friends, and significant others. Items are rated on a seven-point Likert scale ranging from 1 ("very strongly agree) to 7 ("very strongly disagree"). The instrument includes three subscales to address these three types of support (family, friends, significant others). The mean total and subscale scores range from 1 to 7, and a higher score indicates greater perceived social support. This scale has been previously used in the transgender population (Davey et al., 2014).

IIP-32 (Barkham et al., 1996)
The Inventory of Interpersonal Problems-32 (IIP- 32) consists of 32 items to be rated on a five-point Likert scale ranging from 0 ("not at all") to 4 ("extremely"). It consists of eight subscales of interpersonal problems: hard to be assertive, hard to be sociable, hard to be supportive, hard to be involved, too dependent, too aggressive, too caring, and too open. Higher subscale scores indicate greater interpersonal difficulties. The IIP-32 is a shortened version of the original questionnaire, yet the psychometric properties are retained. The IIP-32 has been used successfully in both nonclinical (Berry et al., 2006) and clinical samples (Davey et al., 2015).

Mental Health-related questionnaires - **SCL-90-R** (Derogatis, 1977)
The *Symptom Checklist-90-Revised* (SCL-90-R) is a 90-item self-report symptom inventory, which assesses general psychopathology and provides a global score, referred to as the Global Severity Index (GSI, Derogatis, 1977). This is calculated from scores across nine primary symptoms dimensions: *depression, anxiety, obsessive-compulsive, phobic anxiety, somatisation, interpersonal sensitivity, paranoid ideation, hostility, and psychoneuroticism.* Higher scores indicate greater psychopathology. The SCL has good construct validity and reliability (Derogatis & Unger, 2010), and it has been used frequently across the literature on transgender individuals (De Cuypere et al., 2006; Haraldsen & Dahl, 2000; Simon et al., 2011; Smith et al., 2005).

HADS (Zigmond & Snaith, 1983)
The Hospital Anxiety and Depression Scale (HADS) is a 14- item self-report screening

scale originally developed to indicate the possible presence of anxiety and depression states in the setting of a medical nonpsychiatric outpatient clinic. HADS consists of 2 subscales, HAD-Anxiety (HAD-A) and HAD- Depression (HAD-D), each with seven items, rated on a 4- point Likert scale (ranging from [0], as much as I always do; [1] not quite so much; [2] definitely not so much; to [3] not at all), indicating either symptoms of anxiety or depression during the preceding week. A score of 0 to 7 on either scale is regarding as being in the normal range (no symptoms), a score of 8 to 10 is suggestive of the presence of a mood disorder (possible symptoms), and a score of 11 or higher indicates the probable presence of a mood disorder (symptoms) of the respective state. Maximum subscales scores are 21 for depression and anxiety, respectively. Items referring to symptoms that may have a physical cause are not included in the scale. The HADS was found to perform well in assessing the symptom severity and caseness of anxiety disorders and depression in both somatic, psychiatric, and primary- care patients, and in the general population (Bjelland et al., 2002) and it has been used previously with trans individuals (Gómez-Gil et al., 2012; Hepp et al., 2005).

SIQ-TR (Claes & Vandereycken, 2007)

Self-cutting and its characteristics were assessed by means of the Self-Injury Questionnaire (SIQ). Participants were asked whether they had ever deliberately cut themselves (yes/no) and if they had, how long ago they last did this (in the last week, month, several months ago, more than a year ago, or never). If they injured themselves during the last week or month, they were also asked to indicate which body parts were injured; how many days/month and times/day the cutting occurred; and how often and how much pain they felt during the cutting.

CHAPTER 6. RESULTS

6.1. Study 1: Systematic review and meta-analysis of prevalence studies in transsexualism

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ABSTRACT

Background: Over the last 50 years, several studies have provided estimates of the prevalence of transsexualism. The variation in reported prevalence is considerable and may be explained by factors such as the methodology and diagnostic classification used and the year and country in which the studies took place. Taking these into consideration, this study aimed to critically and systematically review the available literature measuring the prevalence of transsexualism as well as performing a meta-analysis using the available data.

Methods: Databases were systematically searched and 1473 possible studies were identified. After initial scrutiny of the article titles and removal of those not relevant, 250 studies were selected for further appraisal. Of these, 211 were excluded after reading the abstracts and a further 18 after reading the full article. This resulted in 21 studies on which to perform a systematic review, with only 12 having sufficient data for meta-analysis. The primary data of the epidemiological studies were extracted as raw numbers. An aggregate effect size, weighted by sample size, was computed to provide an overall

effect size across the studies. Risk ratios and 95% confidence intervals (CIs) were calculated. The relative weighted contribution of each study was also assessed.
Results: The overall meta-analytical prevalence for transsexualism was 4.6 in 100,000 individuals; 6.8 for trans women and 2.6 for trans men. Time analysis found an increase in reported prevalence over the last 50 years.
Conclusions: The overall prevalence of transsexualism reported in the literature is increasing. However, it is still very low and is mainly based on individuals attending clinical services and so does not provide an overall picture of prevalence in the general population. However, this study should be considered as a starting point and the field would benefit from more rigorous epidemiological studies acknowledging current changes in the classification system and including different locations worldwide.

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1. Introduction

Transsexualism, as defined by the International Classification of Disease (ICD-10) [WHO, 1992] and the previous editions of the Diagnostic and Statistical Manual of Mental Disorders [APA, 1980; APA, 1987], describes individuals who experience discomfort or distress caused by the discrepancy between their gender identity and the sex they were assigned at birth. When this distress is sufficiently intense, individuals wish to transition from one point on a notional gender scale to another – most commonly from a man to a woman (people known as trans women) or from a woman to a man (people known as trans men) [Ahmad el al., 2013; Wylie et al., 2014]. The diagnosis of transsexualism according to the ICD-10 [WHO, 1992] is currently under revision. It is proposed that the new edition of the ICD (ICD-11) will include a new diagnostic term and will also include individuals who do not fit into the gender binary category [Drescher et al., 2012], as is the case in the DSM-5 [APA, 2013].

To estimate the prevalence of trans individuals is relevant for health service development and policymaking, although this can be complex due to several factors. Some of those factors relate to the complexity of undertaking general prevalence studies, i.e. the fact that diagnoses change over the years or that results differ depending on the period of time used to collect data. For example, point prevalence is a measure of the proportion of people in a given population at an exact time point, such as a particular date, which is in contrast to period prevalence that measures the proportion of people in a given population over a specific time period, for example several years [Gerstman, 2003].

Other factors that also add to the complexity of undertaking epidemiological studies relate to the subject studied; in this case the number of transsexual individuals in the community. For example, the terminology and classification systems used have varied over the years, and authors have used some of this terminology inconsistently, for example, gender identity disorder, gender dysphoria, or transsexualism.

Nevertheless, it is reassuring (in relation to performing this meta-analysis) to find that there are many epidemiological studies that have used the term "transsexualism" and which have followed the ICD or DSM diagnostic criteria [Ahmad et al., 2013; Aitken et al., 2015; APA, 1980; APA, 2013; Bakker et al., 1993; Benjamin, 1966; Bockting, 2008] or the definition developed by Benjamin in 1966 [Benjamin, 1966], which requires all of the following:

1) a sense of belonging to the opposite sex, of having been born into the wrong sex, or being one of nature's extant errors;
2) a sense of estrangement from one's own body: all indications of sex differentiation are considered as afflictions and repugnant;
3) a strong desire to resemble physically the opposite sex via therapy, including surgery;
4) a desire to be accepted by the community as belonging to the opposite sex.

The definition of transsexualism is different in the DSM-IIIR [APA, 1987]. This edition of the diagnostic criteria did not include those individuals who were not interested in undergoing sex reassignment surgery and who received the alternative diagnosis of Gender Identity Disorder of Adolescents and Adulthood, Nontranssexual Type (GIDAANT). This great variation in how transsexualism is defined in different studies (based on the diagnostic criteria used at the time that the study took place) will clearly affect the reported prevalence.

A second complexity in developing true epidemiological studies of transsexualism relates to the methods used to identify this population. For example, the country where the study takes place can influence the prevalence of individuals found, as trans people tend to live in larger cities and especially in areas, or countries, which are defined as "trans friendly" [Garrels et al., 2000]. Therefore studies from specific countries may describe a high prevalence of transsexual individuals, which may not be generalizable to other countries. Thirdly, the timing of the study may also affect the findings. The fact that in some countries tolerance to trans individuals has improved over the years has allowed trans people to "come out" more easily in order to access clinical services [FRA, 2014; Keuzenkamp and Kuyper, 2013]. This may be reflected by the fact that older studies [Pauly, 1968] report lower prevalence than more recent ones [Dhejne et al., 2014]. Finally, the recruitment process used to collect epidemiological data will also influence the findings. Many studies are based on clinical populations of individuals, which, by definition, only include those who have the capacity and motivation to ask for help, but, importantly, can also access clinical services [Eklund et al., 1988]. This is reflected in the large number of studies from the Netherlands [Eklund et al., 1988; Kuyper and Wijsen, 2014] where trans services have been available for many years and where society is generally tolerant [FRA, 2014; Keuzenkamp and Kuyper, 2013].

Therefore, as highlighted by the WPATH Standards of Care [Coleman et al., 2012] and other authors' [Zucker and Lawrence, 2009] efforts to formally calculate the prevalence of transsexualism present with enormous difficulties, due to the differences in cultural manifestation of gender behavior. It is because of this that researchers who have studied prevalence rates have focused on the most easily counted subgroup of gender non-conforming people - those who present for gender transition-related care at specialist gender identity clinics [Zucker and Lawrence, 2009]. As a consequence, many prevalence studies published in this field have their origins in the Western world [Wålinder, 1971]. There is only one prevalence study from the Eastern world [Tsoi, 1988], which is surprising given that many countries like Thailand, India and Pakistan are known to have an apparently tolerant culture towards trans* identities, although there are many ethnographic related studies [Nanda, 1985; Nanda, 1998; Reddy, 2005].

The large number of studies investigating prevalence of transsexual individuals, and reviewed in this study, provide the best available insight into the rates of transsexualism, and vary from 0.45 [Wålinder, 1971] to 23.6 [Tsoi, 1988] per 100,000 people. Although prevalence studies are welcome, such a great variation in findings leaves the reader confused. Therefore, the aim of this study was to respond to the reported variation in prevalence by critically and systematically reviewing prevalence studies in transsexualism. Where data were available, a meta-analysis of the studies was carried out which took population, diagnosis, the time period studied and gender into consideration.

2. Methods

2.1. Search strategy

This meta-analytic review adheres to the guidelines detailed in the PRISMA statement [Moher et al., 2009]. A systematic literature search, appraisal and meta-analysis was conducted using a broad range of subject headings in order to identify relevant prevalence studies in the field. The following databases were used: Web of Sciences, Medline/Pubmed, Biosis, Science Direct, and Scielo. For each database, combinations of the following search components were used: transsexual, transgender, gender dysphoria, gender identity disorder, gender non-conforming, gender variant, epidemiology, incidence, and prevalence. Studies published between 1945 and June 2014 were selected. Two researchers independently selected the studies, extracted the data, cross-checked them and resolved disagreements. Case studies or studies describing small populations of individuals which could not be proved to reflect the prevalence of a given area, region or country were excluded. Only studies describing adolescent or adult populations were included. Reference lists of relevant articles were screened for further potential studies and citation searches were conducted. Only studies describing transsexualism as per Benjamin [Benjamin, 1966], ICD [WHO, 1978; WHO, 1992] or DSM [APA, 1980; APA, 1987; APA, 1994; APA, 2000; APA, 2013] definitions were selected. Table 1 details the criteria for search used for this review.

Table 1

Criteria for searches on prevalence of Transsexualism

Category	Criteria
Study population	All races, ethnicities, and cultural groups Adults (>18 years) or adolescents (18-15 years); no children (<15 years)
Study settings and geography	All nations
Time period	Published from 1954 through June 2014
Publication criteria	Included All languages Articles in print or online Excluded Articles in grey literature or non-peer-reviewed journals or unobtainable during the review period

Admissible evidence (study design and other criteria)	Transsexualism, gender identity disorder or gender dysphoria must be diagnosed according to DSM-III, DSM-IIIR, DSM-IV, DSM-IV-TR, DSM-V, ICD-9, ICD-10, or Benjamin criteria. Prevalence must be available or be able to be extracted from the data. Country, number of years used to extract the data, number of trans individuals, natal or preferred gender, mean age, general population of the studied area (divided by natal males and female), to be recorded when possible Eligible study designs include: Observational studies including descriptive studies, evidence that the population described belongs to a defined area, region or country

When the study did not describe some of the above information, whenever possible, this was calculated by the authors. For example, in some cases the mean population of the studied area was calculated. Studies were excluded where there was ambiguity in the number of individuals with a clear diagnosis or studies that primarily included individuals who were self-diagnosed or had not been diagnosed by a professional [Kuyper and Wijsen, 2014; Veale, 2008].

2.2. Procedure

Studies meeting the inclusion criteria were examined. The study collected the available information for the following outcomes of interest:

- prevalence of transsexual individuals in general per 100,000 individuals;
- prevalence of trans women per 100,000 individuals;
- prevalence of trans men per 100,000 individuals;
- sex ratio between males and females;
- country or region where the study took place;
- number of years during which information was collected;
- information regarding methods used to identify trans individuals;
- the change in the trans men/trans women ratio as a function of time (descriptive information).

2.3. Included and excluded studies

Studies were screened in three phases, namely title, abstract, and full text. In the first instance the titles were screened (*n*= 1724). The number of studies found using the above search terms were: transgender (TG) plus epidemiology (259), TG plus incidence (28) and TG plus prevalence (257); transsexualism (TS) plus epidemiology (143), TS plus incidence (51) and TS plus prevalence (130); gender dysphoria (GD) plus epidemiology (24), GD plus incidence (4), GD plus prevalence (11); gender identity disorder (GID) plus epidemiology (390), GID plus incidence (41) and GID plus prevalence (384); Gender non-conforming (GNC) plus epidemiology (1), GNC plus incidence (0) and GNC plus prevalence (1). Duplicates were removed (*n*=251), and the two independent reviewers (J.A. and G.W.) independently screened and coded the remaining titles (*n*=1473). Based on the titles, 1223 papers were excluded. The main reason for exclusion was that the studies did not describe prevalence of transsexualism, gender identity disorder or gender dysphoria, but prevalence of other disorders such as mental health problems or HIV in trans individuals. Out of the 250 studies selected to be screened in detail, 211 were excluded after reading the abstracts. The reasons for the exclusions were:

- inadequate sample size (case studies);
- no prevalence data;
- no specific area, region or country covered by the study.

Out of the 39 papers retrieved for more detailed evaluation, five were excluded as there was no exact epidemiological information or they were not covering a specific, identifiable area (these were not excluded in the previous stage as this information was not identifiable by reading the abstract). Four more studies were excluded as they only described the prevalence of psychiatric co-morbidity, and a further five studies were excluded as the population was self-identified or it was unclear as to whether the participants fulfilled diagnostic criteria. In addition, a case study, a general review on the etiology of transsexualism (with no new data), and two studies that described only children were also excluded. In total 21 studies were systematically reviewed (Fig. 1)

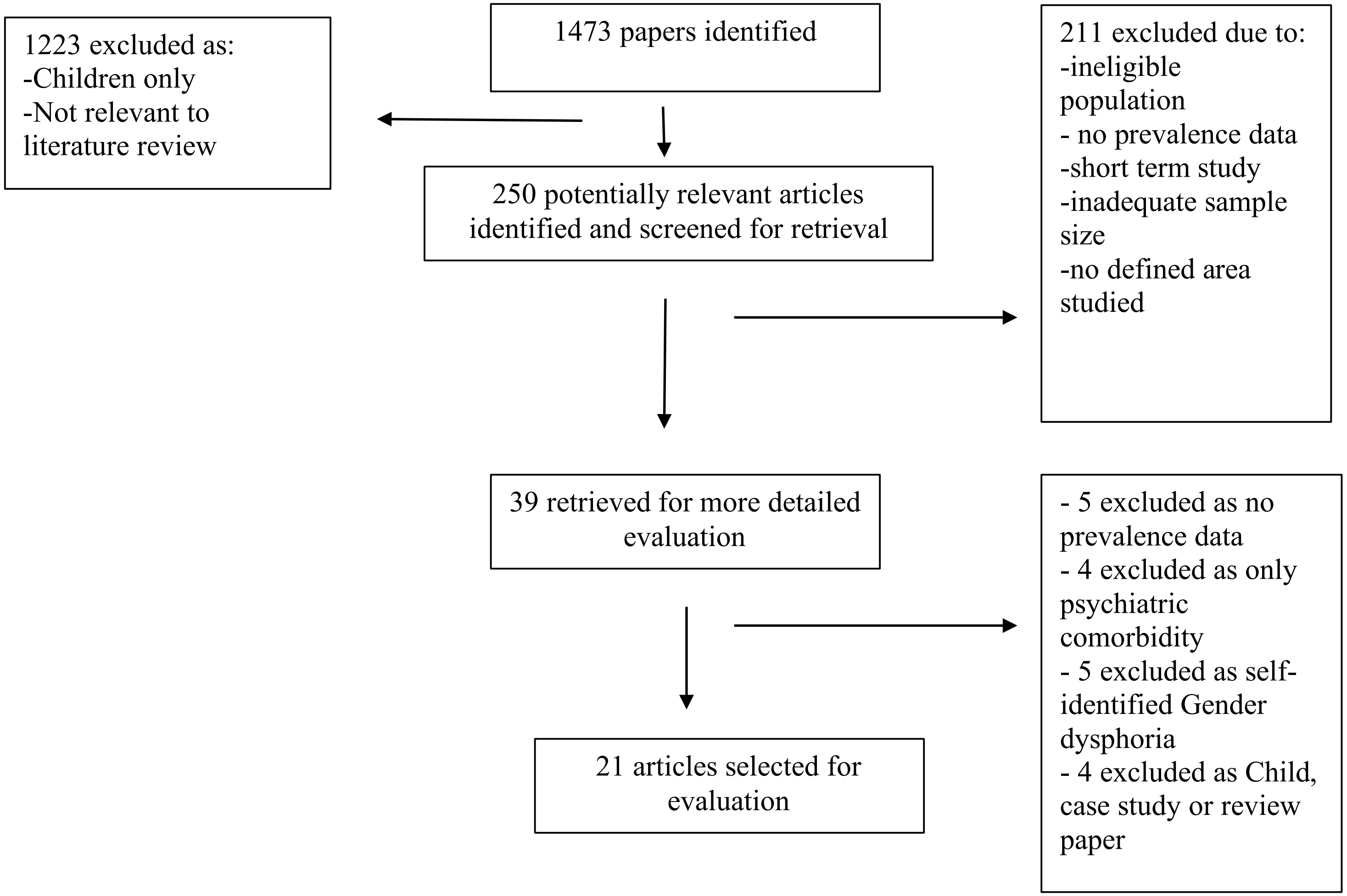

Fig 1. Literature review method used.

2.4. Assessment of quality

The study used a checklist for cross sectional studies based on the NICE checklists [NICE, 2007] developed by Gilbert [Gilbert, 2009] and used in previous studies [Arcelus et al., 2013]. The NICE rating system rates the studies from good quality (when all or most of the criteria have been fulfilled; [++]), reasonable quality (when some of the criteria have been fulfilled; [+]), to poor quality (when few or no criteria are fulfilled; [-]). The review and scoring was based on the quality of the study reporting prevalence of transsexualism. Some of the studies were qualitatively excellent but reported prevalence of sex reassignment surgery instead of transsexualism. In these cases, studies were scored as +* to indicate this.

2.5. Statistical analysis

To calculate the meta-analytical prevalence, only studies that reported new data were included. When several studies used the same data but at different times (i.e., data from clinical databases across years), only the newest *point* prevalence data was selected. In contrast, to calculate time series analysis, information from studies describing *period* prevalence were included and the mean year of the studied period was used as a moderator for the analysis. For studies that spanned several years, the total number of cases (trans men, trans women) were divided by the number of years covered by the study in order to calculate the prevalence per year. Any missing information was estimated.

The primary data of the epidemiological studies were extracted as raw numbers. An aggregate effect size, weighted by sample size, was computed to provide an overall effect size across the studies. Homogeneity among studies was computed using the Q statistic and the I^2 statistic. A significant Q statistic suggests that the distribution of effect size around the mean is greater than would be predicted from sampling error alone, whereas I^2 provides an estimate of the proportion of the variance in the aggregate effect size that is attributable to between-studies heterogeneity [Higgins and Green, 2011]. Random effects models were fitted if there was heterogeneity. Risk ratios and 95% confidence intervals (CIs) were calculated. The relative weighted contribution of each study was also assessed. Meta-analysis was performed using the Comprehensive Meta-Analysis software programme-2 for Windows [Borensteim et al., 2005] according to the Cochrane reviewers' handbook [Higgins and Green, 2011]. Significance was set at $P < 0.05$.

3. Results

3.1. Study characteristics

Most of the studies published were from Europe (18; 85.7%): five from Sweden [Dhejne et al., 2014; Landén et al., 1998; Olsson and Moller, 2003; Wålinder, 1967; Wålinder, 1971], three from the Netherlands [Bakker et al., 1993; Eklund et al, 1988; Van Kesteren et al., 1996], three from the United Kingdom [Hoenig and Kenna, 1974; O'Gorman, 1981; Wilson et al., 1996], two from Germany [Garrels et al., 2000; Weitze and Osburg, 1996] and one each from Spain [Gómez-Gil et al., 2006], Belgium [De Cuypere et al., 2007], Serbia [Vujovic et al., 2009], Ireland [Judge et al., 2014], and Poland [Godlewski, 1988]. There was only one study from the United States of America (USA), which was also the oldest [Pauly, 1968], only one from Singapore [Tsoi, 1988], and only one from Australia [Ross et al., 1981]. Most of the studies from the same country, such as the Dutch and the Swedish studies, used the same data but at different periods therefore covering different years. Other studies from the same country focused on different areas, regions or counties within the country, such as East and West Germany, and Northern Ireland, Scotland or England (three from the United Kingdom). The study period varied from three years [Wålinder, 1971] to an impressive 50 years [Dhejne et al., 2014].

Employing the NICE rating system described above, there were four studies that were scored as (-). This was because they were particularly old studies reporting epidemiological data calculated from approximations [Pauly, 1968], or from information collected from third parties (such as psychiatrists via questionnaires) [Wålinder, 1968], or from primary care [Wilson et al., 1999]. They were also rated as (-) if the information regarding how individuals could access the gender clinic and whether the clinic covered a specific geographical area was unclear [Godlewski, 1988]. Six studies scored (+) as although methodologically strong, the information was gathered from third parties (courts or government) [Veale, 2008; Weitze and Osburg, 1996], endocrinologists [Judge et al., 2014] or surgeons [De Cuypere at al, 2007], or the geographical area covered was unclear [Hoenig and Kenna, 1974; O'Gorman, 1981]. Two studies that focused specifically on sex reassignment surgery were scored as (+*) [Dhejne et al., 2014; Vujovic et al, 2009]. The rest of the studies scored (++) as they were methodologically strong and provided clear epidemiological information regarding the prevalence of transsexualism in the specific country, based on individuals attending a gender identity clinic. Most of the studies were from the same countries, such as the Netherlands and Sweden.

3.2. Population studied

All of the 21 studies selected for the systematic review defined the population studied as transsexual individuals. The majority of the studies used data gathered retrospectively from gender identity clinics. The clinics covered the whole of their countries, such as the Netherlands [Eklund et al., 1988], or a specific geographical area within the country, such as Catalonya in Spain [Gómez-Gil et al., 2006]. The studies used the ICD [WHO, 1992], DSM [APA, 1980; APA, 1987] or Benjamin's [Benjamin, 1966] criteria to define the population.

The reviewed studies provided reliable data and identified a population of transsexual individuals in the following way: seven studies described individuals referred to a gender identity clinic (who fulfilled diagnostic criteria), four studies described individuals who were treated with cross-sex hormones who fulfilled the diagnosis, five studies described individuals who had or were referred for sex reassignment surgery (SRS) and five studies collected information regarding the possible number of transsexual individuals by accessing Governmental organizations, i.e. the bureau of records or virtual statistics. In spite of the complication of reaching a clear diagnosis, most studies were able to provide the estimate of the number of transsexual individuals, trans men and trans women from the age of 15 years.

3.3. Prevalence of transsexualism

Out of the 21 studies selected, 20 provided information on the number of transsexual individuals in their study and gave information about the population that the clinic or studied area covered. The American study [Pauly, 1968] provided only an approximation of trans individuals. Although it is historically important, it does not provide enough information for analysis. As explained above, studies using the same database, but at different time periods were removed for this analysis and only the most recent ones selected. Therefore out of the 20 studies, 12 provided enough new data on prevalence. Those studies provided point prevalence as they reported the number of transsexual individuals at the point when the study took place by reporting the number of individuals since the clinic opened or records began. The prevalence of trans individuals was studied in 12 countries with a total population of 95,141,541 individuals. The largest population studied was in West Germany with nearly 35 million individuals included [Weitze and Osburg, 1996]. There was a similar group of natal males and females within the overall general population with 30,651,864 males and 31,689,246 females.

The 12 studies identified a total of 4355 trans individuals. The largest number of trans individuals were identified in the German study that looked at gender identity clinics in specific areas of Germany, with a total of 1773 trans individuals [Garrels et al., 2000]. However, this study did not provide the highest prevalence of transsexual individuals per 100,000 people. Rather, this was reported in the Singaporean study (23.60 Singapore-born trans individuals per 100,000 people) [Tsoi, 1988]. This study may underestimate the total number of trans individuals in Singapore, as it only includes those who go for sex-reassignment surgery, which is only a proportion of all trans people. Not unexpectedly, more recent studies found higher prevalence rates than older studies. As an example, the recent Swedish study found a prevalence of 16.67 per 100,000 [Dhejne et al., 2014].

Meta-analysis found an overall prevalence of transsexualism using random effects meta-analysis of 0.000046 (95% CI= 0.000028-0.000077). Heterogeneity was high ($I^2 = 99.6\%$; Q value=3314.7) therefore the random effect was selected. This indicates a prevalence of transsexualism of 4.6 per 100,000 or 1 in every 21,739 individuals.

study	Statistics for each study				
	Event rate	Lower limit	Upper limit	Z-Value	p-Value
Hoenig & Kenna 1974	0.000019	0.000015	0.000024	-88.374312	0.000000
Ross et al 1981	0.000024	0.000021	0.000027	-175.566362	0.000000
O'Gorman 1982	0.000019	0.000013	0.000028	-57.492379	0.000000
Tsoi et al 1988	0.000237	0.000216	0.000259	-178.635953	0.000000
Van Kesteren et al 1996	0.000081	0.000076	0.000087	-297.482874	0.000000
Weitze and Osburg 1996	0.000021	0.000020	0.000023	-291.609808	0.000000
Wilson et al 1999	0.000048	0.000041	0.000056	-125.794153	0.000000
Gomez Gil et al 2006	0.000039	0.000034	0.000045	-137.007418	0.000000
De Cuypere et al 2007	0.000053	0.000048	0.000058	-199.916997	0.000000
Vujovic et al 2008	0.000023	0.000019	0.000027	-129.715639	0.000000
Dhejne et al 2014	0.000167	0.000155	0.000180	-226.985486	0.000000
Judge et al 2014	0.000068	0.000059	0.000077	-141.727714	0.000000

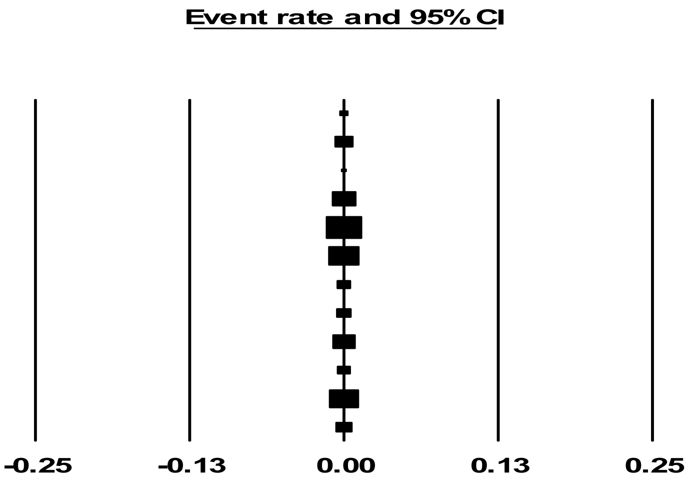

Fig. 2. Meta-analysis on the prevalence of transsexualism

3.4. Prevalence of trans women

All studies identified a higher prevalence of trans women compared to trans men, with the exception of the study by Godlewski [Godlewski, 1988] with a score of (-). Prevalence rates of trans women varied between 0.44 [Wålinder, 1971] and 35.2 per 100,000 [Tsoi, 1988].

As one of the studies did not report the number of female or male individuals in the population studied, this study was removed from subsequent analysis [Weitze and Obsurg, 1996]. Therefore, eleven studies were included in the meta-analysis. An overall prevalence rate of 0.000068 (95% CI= 0.00004 – 0.00010) of trans women was found. Heterogeneity was high (I^2 = 99.0%; Q value=1070.35) therefore random effect was selected. This indicates a prevalence of trans women of 6.8 per 100,000 or 1 in every 14,705 individuals (Fig. 3).

Model	study	Statistics for each study				
		Event rate	Lower limit	Upper limit	Z-Value	p-Value
	Hoenig & Kenna 1974	0.000030	0.000022	0.000039	-72.978449	0.000000
	Ross et al 1981	0.000042	0.000036	0.000048	-145.805211	0.000000
	O'Gorman 1982	0.000029	0.000019	0.000044	-47.947147	0.000000
	Tsoi et al 1988	0.000350	0.000315	0.000389	-147.330866	0.000000
	Van Kesteren et al 1996	0.000121	0.000113	0.000130	-243.491123	0.000000
	Wilson et al 1999	0.000078	0.000066	0.000093	-106.547824	0.000000
	Gomez Gil et al 2006	0.000055	0.000046	0.000065	-112.230595	0.000000
	De Cuypere et al 2007	0.000078	0.000069	0.000087	-161.694523	0.000000
	Vujovic et al 2008	0.000022	0.000018	0.000028	-90.222401	0.000000
	Dhejne et al 2014	0.000116	0.000105	0.000127	-187.715946	0.000000
	Judge et al 2014	0.000098	0.000084	0.000115	-116.323709	0.000000

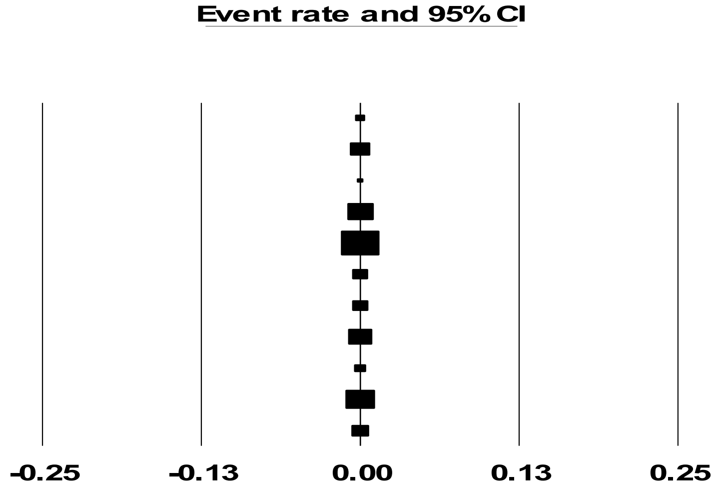

Fig. 3. Meta-analysis on the prevalence of trans women.

3.5. Prevalence of trans men

Most studies reported a smaller number of trans men when compared to trans women. Prevalence rates varied from 0.25 [Pauly, 1968] to 6.64 per 100,000 [Dhejne et al., 2014]. The trans women to trans men ratios varied from 6.1 trans women to every one trans men (6:1) [Reddy G, 2005] to 1 to 1 (1:1) [Vujovic et al., 2009].

Eleven studies were included in the meta-analysis. An overall prevalence rate of 0.000026 (95% CI= 0.000017 – 0.00004) was found. Heterogeneity was also high ($I^2 = 97.7\%$; Q value=435.1). This indicates a prevalence of trans men of 2.6 per 100,000 or 1 in every 38,461 individuals. Using meta-analytical prevalence rates, the ratio of trans women to trans men was found to be 2.6 trans women for every trans man (2.6:1) (Fig. 4 and Table 2).

study	Statistics for each study				
	Event rate	Lower limit	Upper limit	Z-Value	p-Value
Hoenig & Kenna 1974	0.000009	0.000006	0.000015	-47.810027	0.000000
Ross et al 1981	0.000007	0.000005	0.000009	-69.495292	0.000000
O'Gorman 1982	0.000010	0.000005	0.000021	-30.460159	0.000000
Tsoi et al 1988	0.000120	0.000100	0.000145	-96.769109	0.000000
Van Kesteren et al 1996	0.000043	0.000038	0.000048	-164.890182	0.000000
Wilson et al 1999	0.000019	0.000014	0.000027	-62.373363	0.000000
Gomez Gil et al 2006	0.000022	0.000017	0.000029	-76.557473	0.000000
De Cuypere et al 2007	0.000030	0.000025	0.000035	-114.211995	0.000000
Vujovic et al 2008	0.000023	0.000018	0.000028	-93.198522	0.000000
Dhejne et al 2014	0.000066	0.000059	0.000075	-152.689491	0.000000
Judge et al 2014	0.000036	0.000028	0.000047	-78.561306	0.000000

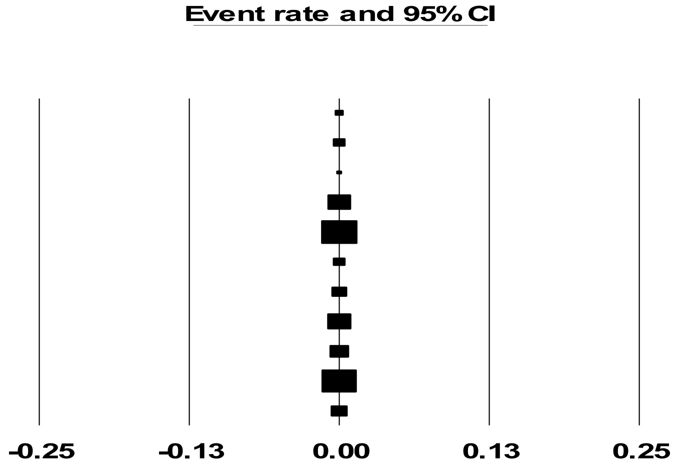

Fig. 4. Meta-analysis on the prevalence of trans men.

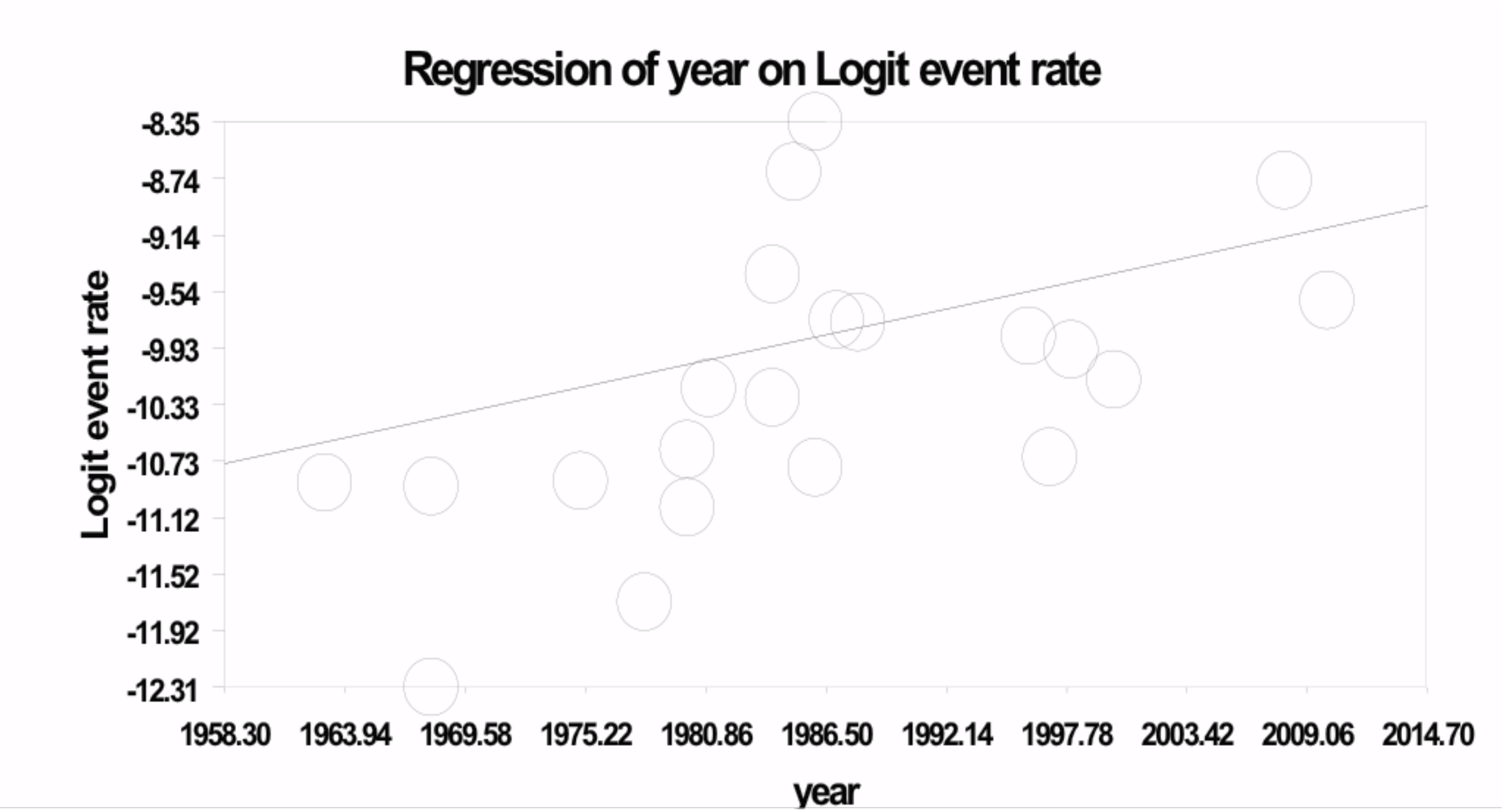

Fig. 5. Time series analysis on the prevalence of transsexualism according to date of study.

3.6. Change of prevalence rates over the years

For the time series analysis 17 studies that provided period prevalence data at different time points were included. Most of the studies provided data from a period of time between 4 and 10 years. In order to undertake time series analysis a regression analysis was undertaken with date as a moderator variable. The date selected was calculated as the mean of the numbers of years of the study period. Time series analysis showed a statistically significant effect for general transsexualism (z=23.45, $P < 0.001$), trans women ($z = 22.13$, $P < 0.001$), and trans men ($z = 8.00$, $P < 0.001$) suggesting a higher prevalence of transsexual individuals, trans women and trans men in more recent studies (Fig. 5).

Table 2

Studies reviewed for the systematic review on prevalence of transsexualism

Name	Date	Dates studied	Country	Age	Method	Total	Prevalence for 100,000	TW 100,000	TM 100,000	Sex ratio M/F (biological)
Pauly	1968	n/a	USA	n/a	Approximation	n/a	0.40	1	0.25	4 to 1
Wålinder [b]	1967	n/a	Sweden	>15	Ask all psychiatrists to inform them of all the transsexuals known to them. 3/4 replied	110	1.42	2.7	0.97	2.8 to 1
Wålinder [b]	1971	1967-1970	Sweden	>15	Referrals to gender clinic	27	0.45	0.44	0.44	1 to 1
Hoenig & Kenna [a.b]	1974	1958-68	England and Wales	>15	Referrals to gender clinic	66	1.92	2.94	0.92	3.2 to 1
Ross et al. [a.b]	1981	1979-1981	Australia	>15	Questionnaire to all psychiatrist in	272	2.40	4.16	0.66	6.1 to 1

					Australia via the journal				
O'Gorman [a.b]	1982	1968-1982	Northern Ireland	>15	Referrals to gender clinic	28	1.92	2.85	1	2.8 to 1
Eklund et al. [b]	1988	1976-1980	The Netherlands	>15	Treated at the gender clinic (with hormones)	120	1.22	2.22	0.5	3 to 1
		1976-1983	The Netherlands	>15	Treated at the gender clinic (with hormones)	233	1.58	3.84	1	3 to 1
		1976-1986	The Netherlands	>15	Treated at the gender clinic (with hormones)	538	2.77	5.55	1.85	3 to 1
Godlewski	1988	1974-78	Poland	>14	Referrals to sexology clinic	26	n/a	n/a	n/a	1 to 5.5
Tsoi [a.b]	1988	Alive in 1986	Singapore	>15	Sex reassignment surgery	458	23.60	35.2	12	3 to 1

Bakker et al. [b]	1993	1976-1990	The Netherlands	>15	Treated at the gender clinic (with hormones)	713	4.42	8.4	3.28	2.5 to 1
Van Kesteren et al. [a.b]	1996	1975-1992	The Netherlands	>15	Treated at the gender clinic (with hormones)	998	8.05	12.11	4.3	3 to 1
Weitze and Osburg [a.b]	1996	1981-1990	West Germany	n/a	Questionnaires to courts that handles legal registration of sex change	733	2.10	2.38	0.96	2.3 to 1
Landén et al. [b]	1996	1972-1996	Sweden	>15	Use of care and sex assignment	233	3.42	4.03	2.83	1.4 to 1
Wilson et al. [a.b]	1999	1998	Scotland	>15	Patients register in GP practice, via questionnaires, I selected those taking hormones or postoperative	160	4.79	7.82	1.92	4 to 1

Garrels et al.	2000	1964-1998	Germany	>14	Referrals to different gender services	1773	n/a	n/a	n/a	1.2 to 1 last 4 years.
Olsson and Möller. [b]	2003	1972-2002	Sweden	>15	Application for sex reassignment	402	5.91	7.34	4.54	1.61 to 1
Gómez-Gil et al. [a.b]	2006	1996-2004	Spain (Cataluña)	>15	Referral to gender clinic	182	3.88	4.75	2.07	2.6 to 1
De Cuypere et al. [a.b]	2007	1985-2006	Belgium	>15	All TS who underwent SR from plastic surgeons	412	4.28	7.75	2.95	2.43 to 1
Vujovic et al. [a.b]	2008	1987-2006	Serbia	>18	Referral to gender clinic	147	2.25	2.23	2.27	1 to 1
Dhejne et al. [a.b]	2014	1960-2010	Sweden	>17	Applications for legal and surgical sex reassignment	681	16.67	11.57	6.64	1.6 to 1
Judge et al. [a.b]	2014	2005-2014	Ireland	>15	Referral to endocrine clinic for hormones	218	6.77	9.84	3.61	2.7 to 1

TS: transsexuals; TW: trans women; TM: trans men

[a.] Studies for meta-analysis. Studies describing point prevalence

[b] Studies for time line. Studies providing information on period prevalence.

4. Discussion

This is the first study that has aimed to critically review and meta-analytically investigate the prevalence of transsexualism. Twenty-one studies were identified as having enough data and using similar diagnostic criteria suitable for a critical review, with 12 studies having enough data to perform a meta-analysis. Most epidemiological studies in this area have investigated the prevalence rates of HIV in this population [Nuttbrock et al., 2013; Operario et al., 2008; Poteat et al., 2014] and very few have investigated the number of trans people in the general population, which may be due to the complex methodology required to undertake such studies.

This study showed that there has been a clear increase in the prevalence of individuals diagnosed with transsexualism over time, with newer studies reporting statistically significant higher rates than older studies. Countries using the same database over the years have reported an increased prevalence of individuals attending clinical services, receiving prescribed cross-sex hormones, or applying for sex reassignment surgery. The overall meta-analytical prevalence of transsexualism was found to be 4.6 per 100,000, with the meta-analytical prevalence of trans women being higher (6.8 in 100,000) than that of trans men (2.6 in 100,000). Although the sex ratio has moved closer to 1:1, using the meta-analytical prevalence, the trans women to trans men ratio was calculated to be 2.6 to 1.

The increase in prevalence over the years is likely due to several factors: the increased visibility of trans people in the media, which likely contributes to at least a partial destigmatization of being trans [Aitken et al., 2015]; the wide availability of information on the Internet about transsexualism or gender dysphoria, which also likely contributes to destigmatization [Aitken et al., 2015]; the increased awareness of the availability of biomedical treatment [Ahmad et al., 2013; Coleman et al., 2012; Wylie et al., 2014]; and the development of societal tolerance towards trans individuals [Keuzenkam and Kuyper, 2013]. With regards to the latter, most of the studies investigating social attitudes to gender and sexual diversity have primarily explored peoples' attitudes towards gay, lesbian, and bisexual (LGB) individuals. The 2012 edition of the Eurobarometer however, included questions aiming at measuring the public attitudes to transgender people in European countries for the first time. The most tolerant countries appear to be Denmark, Luxembourg, Ireland, Sweden and the United Kingdom. Interestingly, the proportion of individuals who feel uncomfortable with trans people was larger than for

LGB people in all European countries. In six European countries the majority of people report to feel comfortable with a trans person as a government leader: Denmark, Sweden, Luxembourg, Spain, the United Kingdom and the Netherlands [Keuzenkamp and Kuyper, 2013]. This report is the first to specifically explore societal tolerance towards trans people.

Recent reports indicate that the number of individuals with gender dysphoria who attend clinical services for an assessment has increased substantially over the years in many European countries [Aitken et al., 2015; de Vries et al., 2015]. There is also a significant increase in people who self-diagnose as suffering from gender dysphoria [Kuyper and Wijsen, 2014]. Although this review did not include studies of people who self-diagnose, such studies are important as they may indicate the level of future demand for clinical services. For example, Kuyper and Wijsen [Kuyper and Wijsen, 2014] found that 4.6% of natal men and 3.2% of natal women in their Dutch population sample reported an ambivalent gender identity (equal identification with other sex as with sex assigned at birth) and 1.1% of the natal men and 0.8% of the natal women reported an incongruent gender identity (stronger identification with other sex as with sex assigned at birth). It remains unknown how many of their sample will seek assessment and treatment via a gender identity clinic service.

Many trans individuals require clinical services as they wish to have cross-sex hormone treatment and surgery to alleviate their gender dysphoria. However, some feel that only one of these treatment modalities is necessary for them, whilst others may decide to not take cross-sex hormones or undergo any operations [Bockting, 2008; Bockting, 2011]. Psychotherapy can be helpful for some individuals to integrate their transgender feelings into their gender role assigned at birth and do not feel the need to feminize or masculinize their body; for those changes in social gender role and expression can be sufficient to alleviate gender dysphoria [Bockting, 2008; Coleman et al., 2012]. Moreover, many trans individuals may have socially transitioned with or without partial treatment through self-prescribed cross-sex hormones or private means [Davies et al., 2013; Mepham et al., 2014].

The complex care pathway of trans individuals, makes the organization of service delivery difficult to plan ahead. The prevalence of people requiring assessment and treatment for gender dysphoria may be more accurately estimated by looking at community studies. Studies reporting prevalence rates of SRS are likely to underestimate the true prevalence of transsexualism in the community. Since one of the largest studies in this meta-analysis identified their participants via applications for SRS [Zucker and Lawrence, 2009] , the overall prevalence rate is likely to be higher than the one reported in this meta-analysis.

The main strength of this paper is the fact that this is the first study that summarizes and critically assesses all the available data in the subject of trans epidemiology taking into consideration the weight of the study in the analysis, in order to avoid biased results based on large studies. While studies have become methodologically stronger over the years, this review and meta-analysis is limited by the available data. The majority of the studies were conducted in Western countries, particularly in Europe, and the results may be related to the level of tolerance of society, the healthcare system available, legislation regarding the rights of trans people and the academic interest in the area of trans healthcare. This is clearly reflected by the large body of research originating from Europe, particularly in Sweden and the Netherlands. There are a limited number of reports regarding trans individuals from developing countries [Franz, 1996; Hahn, 2004; Ruan et al., 1989; Zhaoji et al., 1997]. This may simply indicate that while trans individuals do indeed have access to services, no epidemiological studies have been undertaken. Alternatively for some countries, it may indicate that there are no clinical services available and that trans individuals in these areas need to suppress their real self, the consequence of which may be the development of mental health problems [Claes et al., 2015; Davey et al., 2014; Heylens et al., 2014].

The study is limited by the high heterogeneity of the included studies, which is not surprising as there are clear differences between the methodology of the studies included in the review. This is reflected in the great variation of prevalence data from the different studies. We use a random effects model in an effort to incorporate heterogeneity between the studies in our analysis but recognize that this does not eliminate the fact that heterogeneity was present. In spite of the limitations of this meta-analytical study, and the majority of the prevalence studies reviewed, the existing data should be considered as a starting point. The field would benefit from more rigorous epidemiological studies acknowledging current changes in classification system and including different locations worldwide.

Statement of authorship

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Acquisition of Data: Jon Arcelus; Gemma Witcomb.

Analysis and Interpretation of Data: Jon Arcelus; Wim Van Den Noortgate; Laurence Claes.

Category 2

Drafting the Article: Jon Arcelus; Walter Pierre Bouman; Laurence Claes ; Gemma Witcomb ; Fernando Fernandez-Aranda.

Revising it for Intellectual Content: Jon Arcelus; Walter Pierre Bouman; Laurence Claes ; Gemma Witcomb ; Fernando Fernandez-Aranda.

Category 3

Final Approval of the Completed Article: Jon Arcelus; Walter Pierre Bouman; Wim Van Den Noortgate; Laurence Claes; Gemma Witcomb; Fernando Fernandez-Aranda.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

6.2. Study 2: Body Image Dissatisfaction and Eating-Related Psychopathology in Trans Individuals: A Matched Control Study

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Abstract

High levels of body dissatisfaction have already been reported in the trans population; however, the root of this dissatisfaction, and its association with eating disordered behaviours, has not been studied in-depth. This study aims to assess eating disorder risk by comparing 200 trans people, 200 people with eating disorders and 200 control participants' scores on three subscales of the Eating Disorders Inventory-2 (EDI-2) and to further explore dissatisfaction in the trans participants using the Hamburg Body Drawing Scale (HBDS). The results showed that overall participants with eating disorders scored higher than trans or control groups on all EDI-2 measures, but that trans individuals had greater body dissatisfaction than control participants and, importantly, trans males had comparable body dissatisfaction scores to eating disordered males. Drive for thinness was greater in females (cis and trans) compared to males. In relation to HBDS body dissatisfaction, both trans males and trans females reported greatest dissatisfaction not only for gender-identifying body parts but also for body shape and weight. Overall, trans males may be at particular risk for eating disordered psychopathology and other body image-related behaviours. Copyright © 2015 John Wiley & Sons, Ltd and Eating Disorders Association.

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Keywords
transsexual; trans; drive for thinness; body dissatisfaction; eating disorder risk

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Introduction

Trans people are those people who are not content to remain in the gender they were assigned at birth. Although a number of different terms have been used over the years to describe such individuals, the terms 'trans individuals', 'trans females' and 'trans males' will be used throughout this paper to describe this population. In contrast, the term cisgender is used to refer to those people who are content to remain the gender they were assigned at birth, that is, they are non-trans people.

Trans females are those people assigned male at birth but who identify as female and trans males are those people who were assigned female at birth and who identify as male. Both groups will live in their preferred gender and many, but not all, will have interventions such as hormones and surgeries to affect a body in line with their identity. There are diagnoses associated with this condition, although the place of diagnosis is contested by clinicians working in the field [Richards and Barker, 2013]. Nonetheless, it remains as Transsexualism, in the International Classification of Disease (ICD) 10th edition [World Health Organisation, 1992], and is under review in preparation for the new edition of the ICD (ICD-11), where it is expected that it will include individuals who do not necessarily wish to transition from one binary point on a notional gender scale to the other (male to female or female to male). This will put it in line with the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) diagnosis of gender dysphoria [American Psychiatric Association, APA, 2013].

Estimates of the prevalence of trans people in the general population range from 0.45

[Wålinder, 1971] to 23.6 [Tsoi, 1988] per 100,000 people, with the variation explained by factors such as methodology used, country in which the study took place, year in which the study took place, and the means of classification used. A recent meta-analysis of all appropriate studies found the prevalence for transsexualism to be 4.6 in 100,000 individuals; 6.8 for trans females and 2.6 for trans males, with time analysis finding an increase in reported prevalence over the last 50 years [Arcelus et al., 2015]. The prevalence of trans people within the clinical eating disorder population is unknown, although case studies do report trans people with eating disorder [Fernandez-Aranda et al., 2000; Hepp et al., 2004; Hepp et al., 2005; Winston et al., 2004].

Regardless of the desired gender, trans individuals may face a number of difficulties. For example, rates of mental health problems [McNeil et al., 2012] and self-harm are high [Claes et al., 2014; Clark et al., 2014; Liu and Mustanski, 2012], possibly because of limited social support [Davey et al., 2014]; as are experiences of harassment [Mitchell et al., 2014; Whittle et al., 2007]. Notwithstanding this, one of the roots of distress felt by trans individuals is a high level of body dissatisfaction [Cuzzolaro et al., 2006]. This is not surprising, of course, as almost by definition, trans people feel dysphoria about their bodies, especially sexual characteristics such as breasts, penis and so on. This dysphoria has been shown to reduce with the use of hormone and surgical treatments [Bandini, 2013]. For example, trans females taking oestrogens will experience finer and reduced facial and body hair growth; an increase in subcutaneous fat deposits and fat distribution around the hips and buttocks; breast growth; and reduced muscle bulk and definition - all of which help to promote a female appearance. Similarly, trans males taking testosterone will no longer experience menses and will experience a redistribution of fat; increased muscle mass; and a deepening of the voice - which helps to promote more male appearance [Seal, 2007].

However, there are other aspects of appearance that are difficult or impossible to change with hormones or surgery often relating to skeletal changes at puberty such as body shape and weight, shoulder size and so on, which may be a continued source of body dissatisfaction. This can make the trans individual at risk of dietary restriction in order to modify their body shape towards their desired gender form [Algars et al., 2012]. Consequently, it follows that trans individuals may represent a particularly vulnerable group for the development of disordered eating; both trans females who by birth sex tend to be larger and trans males who by birth sex have more fat stores. Furthermore, since internalisation of the ‘thin ideal’ (the message communicated through media and culture that to be beautiful is to be thin) has been implicated as a risk factor for the development of eating disorders in females [Kroon Van Diest and Perez, 2013; Witcomb et al., 2013], it is likely that trans females will internalise this message. If so, trans females may be particularly susceptible to developing disordered eating psychopathology, compared with trans males, because of their desire to not only achieve a congruent body but also one that conforms to the socially promoted thin ideal.

Until recently, little attention has been paid to the prevalence of disordered eating in the trans population. Studies investigating this association have either been case studies [Fernández-Aranda et al., 2000; Hepp et al., 2004; Hepp et al., 2005; Winston et al., 2004] or have been methodologically limited by the small numbers of individuals studied [e.g., Hepp and Milos, 2002; Murray et al., 2013] or the lack of matched controls.

An example of this is Khoosal, Langham, Palmer, Terry, and Minajaji [2009] who compared scores on the EDI between 40 trans females (mean age = 41.8 years), 147 female eating disorder patients (mean age = 27.0 years) and standardised group norms from 577 control participants (mean age = 19.9 years) [Garner et al., 1983]. They found that trans females scored similar to cisgender males, with lower drive for thinness, bulimia and body dissatisfaction scores than those of cisgender females. However, the authors of this study did not match both groups according to age, which limits the interpretation of the results, as eating disorder symptomatology has been associated to age [Hudson et al., 2007]. Furthermore, the study did not distinguish between trans individuals at different stages of transition (i.e. those who had not taken hormones and those who had), which is problematic in light of other studies that demonstrate how body image is altered by the use of cross sex hormones or surgery [e.g. Fisher et al., 2013].

Another limitation of previously conducted studies is the lack of strict criteria such as diagnosis being used to identify individuals. For example, Vocks, Stahn, Loenser, and Legenbauer [2009] concluded that although trans participants scored lower on various measures of eating psychopathology compared to those with diagnosed eating disorders, their (albeit non-significant) elevated scores in comparison to a control population suggest that they may still be at a higher risk of eating disturbances. However, the trans participants were all self-identified (as opposed to having a formal diagnosis), which may have given rise to such a differing range of presentations as to obviate the findings. Similarly, another study that reports differences in eating psychopathology is based on comparisons between controls and those who report "gender identity conflict" [assessed by the Gender Identity Scale for Males (amended to include female-appropriate questions); Freund et al., 1977], as opposed to patients with a strict diagnosis [Algars et al., 2010].

Confirming diagnoses and matching participants on gender allows these potential confounds to be controlled. However, in studies involving trans participants, whether to match by birth assigned or identified gender is a complex question. Auer et al. [2013] investigated psychopathological symptom profiles in trans participants, matched with controls both on identified and birth assigned gender. Trans participants were found to display psychopathological profiles more similar to their counterparts who shared their identified gender – leading the authors to conclude that this may reflect a more appropriate comparison than matching according to birth assigned gender. Therefore, in the research study that forms the centre of this paper, comparisons are made according to the trans participants' desired gender (i.e., cisgender female control participant and cisgender female eating disorder participant matched with a trans female participant).

After considering the existing literature, it was hypothesised that trans individuals will have both a higher drive for thinness and a higher body dissatisfaction than healthy eating controls, but that this will be lower than seen in eating disorder controls. Furthermore, it was hypothesised that trans females will be more similar to cisgender female controls and that trans males will be more similar to cisgender male controls, than to their natal gender counterparts. Therefore, one of the aims of the current study was to explore eating psychopathology, body dissatisfaction and gender differences across three groups of individuals matched on phenotypic gender - those who fulfill diagnostic criteria for transsexualism (ICD 10), those with a diagnosed eating disorder and a cisgender control group who do not have an eating disorder.

Although body dissatisfaction has been reported to be a risk factor for eating disorders [Stice and Shaw, 2002], elevated levels of body dissatisfaction that are driven by dissatisfaction with sexual characteristics may not pose such a risk. Understanding what is driving body dissatisfaction in trans individuals is important to understand when they might be at risk of developing eating disorders. In view of the above the second aim of the current study is to identify the nature of body dissatisfaction among trans individuals by investigating the specific body parts (e.g., genitals, voice, head, body shape) that cause discomfort.

Method

Participants

Participants were recruited in three ways. Trans participants were recruited prospectively from all eligible referrals to an National Health Service (NHS) Centre for Gender Dysphoria that spans all over the UK; eating disorder participants were recruited retrospectively from a clinical database at an NHS Adult Eating Disorder Service, covering a large county and control participants were recruited prospectively, with additional data taken retrospectively, as part of an ongoing database of healthy controls at Loughborough University recruited from all over the UK. All participants were matched by gender; natal gender for the cis gender individuals matched with identified gender for the trans individuals (e.g., female control participant and female eating disorder participant, with a trans female (natal male) participant). Participants were not matched on any other socio-demographic variables as these were not available for all three groups.

Trans individuals

The sample consisted of all individuals who completed the assessment process at the Nottingham Centre for Gender Dysphoria (NCGD) in the United Kingdom during an 18-month period between January 2013 and June 2014. All consecutively referred individuals, who following assessment, fulfilled a diagnosis of transsexualism by two independent gender specialists working at the Centre as per the ICD-10 [World Health Organisation, 1992], and were accepted for treatment, were invited to participate in the study. During this period of time, 345 referrals were made to the centre. Out of the 345 referrals, 205 (59.4%) completed the assessment and fulfilled the diagnostic criteria for transsexualism according to the ICD-10 [World Health Organisation, 1992]. One hundred and forty individuals were excluded, of whom 40 (28.6%) did not attend, 49 (35%) did not have their assessment completed during the study period, 15 (10.7%) had socially transitioned and were on cross-sex hormone treatment before referral and 36 (25.7%) did not fulfill a diagnosis of transsexualism. Of the remaining 205, five did not complete the questionnaires fully and so were excluded. This resulted in 200 trans participants (75 trans males and 125 trans females).

Eating disorder patients

The above participants were matched by identified gender with patients who had been assessed at the Leicestershire Adult Eating Disorder Service in the UK and diagnosed with an eating disorder. As the number of males assessed at the Service was smaller than the one assessed at the NCGD, information from the most recent assessments between January 2007 and June 2014 was selected. Patients are assessed using the Clinical Eating Disorders Rating Instrument [Palmer et al., 1987], which is a semi-structured investigator-based interview that measures eating-related behaviours and attitudes in accordance with DSM-IV criteria. The tool has been shown to have good reliability and validity [Palmer et al.,1996].

Controls

Trans and eating disorder participants were also matched with 200 control participants who were cisgender; not accessing any mental health services and not suffering from any eating disorder, measured by means of self-report. They were selected (in chronological order based on desired gender, i.e., first 75 males and the first 125 females) from a pool of 300 people recruited via an online survey hosted by Loughborough University between December 2012 and October 2013. A snowballing sampling technique was employed whereby links were posted to social media networks or emailed to contacts and respondents were asked to share with their networks.

Ethical approval for the study was awarded by the NHS research ethics committee, after a full review. In addition, collection of data from each group was approved by the relevant research and development departments; the Nottinghamshire Healthcare NHS Trust for the trans participants and Leicestershire Partnership NHS Trust for the eating disorder participants. Recruitment of control participants was approved by the Loughborough University ethics committee.

Measures

Eating Disorders Inventory-2 [Garner, 1991]

This was completed by all three groups and is a self-report questionnaire used to assess the presence psychological and behavioral traits of eating disorders. It consists of 11 subscales; three measure eating-related symptoms and the remainder measure psychological disturbances, characteristic of those with clinical eating disorders, for example, interpersonal distrust, fear of maturity and perfectionism. The three subscales that measure eating-related behaviours were used in the present study. These were as follows: (1) drive for thinness - seven questions that assess the extent to which an individual exhibits an excessive concern with dieting, preoccupation with weight and fear of weight gain (for example, ‘I am terrified of gaining weight’); (2) bulimia – seven questions that assess whether and how often an individual reports episodes of binge eating and purging (for example, 'I have gone on eating binges where I felt that I could not stop'); and (3) body dissatisfaction – nine questions that assess the extent to which an individual is not satisfied with their physical appearance (for example, 'I feel satisfied with the shape of my body'). Responses are made using a 6-point scale from *'never', 'rarely', 'sometimes', 'often', 'usually'* to *'always'*. This questionnaire has been used widely in the literature and has been validated in the USA [Garner, 1991] and many European samples [e.g., Sweden; Nevonen and Broberg, 2001, and Holland; van Strien and Ouwens, 2003].

The Hamburg body drawing scale [Appelt and Strauß, 1988]

This was completed by the trans group only. It is a pictorial measure that asks participants to indicate how (dis)satisfied they are with specific parts of their body. Thirty-three different body characteristics (e.g. voice, skin, arms, chest, outer labia, penis) are identified on a body drawing and participants are asked to rate each (if applicable) on a 5-point Likert scale ranging from 1 ('*very satisfied*') to 5 ('*very dissatisfied*'). In addition, respondents are asked to give a rating for their overall whole body (dis)satisfaction and '*other*', if applicable. This scale has recently been validated for use in research with trans populations [Becker et al., 2014].

Data analysis

All data were analysed using SPSS 21. Multivariate 3x2 ANOVAs were performed to establish differences in the EDI-2 subscales between the three groups. As there is no non-parametric equivalent for a 3x2 comparison, and given that only some of the data were marginally non-normally distributed and the robustness of ANOVA to deal with violations to normality assumptions, this was considered acceptable. For these ANOVAs, group (trans / eating disorder / controls) and gender / identified gender (male / female) were entered as factors. Any significant differences or interactions between groups were explored using Tukey's *post hoc* test statistic. One-way ANOVAs were then used to compare the reported dissatisfaction with individual body parts between trans males and trans females. The level of significance used was $p<0.01$.

Results

Aim 1 involved 600 participants (mean age = 35.14 years, *SD* = 57.04): 200 individuals with a diagnosis of transsexualism according to the ICD-10 [World Health Organization, 1992]; 200 individuals diagnosed with an eating disorder according to DSM-IV [American Psychiatric Association, APA, 1994] (54 anorexia nervosa, 77 Bulimia Nervosa, 69 Eating Disorders Not Otherwise Specified); and 200 controls. Each group was made up of 75 males (cisgender and trans males) and 125 females (cisgender and trans females). The groups did not differ in age (*F*[1.67,2], *p*=0.19). Aim 2 involved the trans participants only; 75 trans males and 125 trans females.

Across the three groups, there was no effect of gender on age (*F*[3.00,2], *p*=0.084). However, taking each group individually, trans males were found to be significantly younger (mean age = 25.36, *SD* = 9.60) than trans females (mean age = 38.56, *SD* =14.21; *F*[50.74, 1], *p*<0.0001). This reflects the numbers seen in clinical practice within NCGD referrals data.

Aim 1: eating psychopathology comparison across three groups

Drive for thinness.

There was a main effect of group (*F*[233.16,2], *p*<0.0001) with *post hoc* tests revealing that the eating disorder group had significantly higher scores than both the control (mean difference = 10.45) and trans groups (mean difference = 9.44; both *p*<0.0001). The difference between trans and controls was not significant (mean difference = 1.11, *p*=0.76). There was a main effect of gender (*F*[20.51,1), *p*<0.0001), with cisgender females/trans females scoring higher than cisgender males/trans males (Table 1 and Figure 1a). There was also a significant interaction between Group and Gender (*F*[5.64,2], *p*=0.004).

Bulimia

There was a main effect of group (*F*[119.83,2], *p*<0.0001) with *post hoc* tests revealing that the eating disorder group had significantly higher scores than both the control (mean difference = 5.97) and trans groups (mean difference = 5.73; both *p*<0.0001) (Table 1). There was no effect of gender or group and gender interaction (Figure 1b).

Body dissatisfaction

There was a main effect of group (*F*[94.52,2], *p*<0.0001), with *post hoc* tests revealing that the eating disorder group had significantly higher scores than both the control (mean difference = 10.13) and trans groups (mean difference = 5.58; both *p*<0.0001). The trans group also scored significantly higher than the control group (mean difference = 4.55, *p*<0.0001). There was a significant main effect of gender (*F*[8.15,1], *p*=0.004), with the combined female groups scoring higher than combined male groups (Figure 1c). However, there was also a significant interaction between group and gender (*F*[29.97,2], $p<0.0001$) showing that the cisgender females and trans males were more dissatisfied than cisgender males and trans females (birth assigned male but identify as female). Trans males also had near identical body dissatisfaction scores to eating disorder males (Figure 1c).

Table 1 Mean (*SD)* age and Eating Disorder Inventory-2 scores for the three groups matches on desired gender

	Trans group			Eating disorder group			Control group		
	Trans male *n*=75	Trans female *n*=125	All *N*=200	Cisgender Male *n*=75	Cisgender Female *n*=125	All *N*=200	Cisgender Male *n*=75	Cisgender Female *n*=125	All *N*=200
Age	25.36 (9.60)	38.56 (14.21)	33.61 (14.19)	30.80 (11.83)	29.50 (10.57)	29.99 (11.05)	33.69 (8.81)	46.70 (122.35)	41.82 (96.94)
Drive for thinness	4.13 (5.38)	4.04 (4.97)	4.08 (5.11)*	11.61 (6.20)	14.50 (5.63)	13.42 (6.00)*/**	1.08 (1.89)	4.10 (4.97)	2.97 (4.34)**
Bulimia	1.76 (3.20)	1.47 (3.21)	1.58 (3.20)*	7.31 (6.21)	7.31 (6.19)	7.31 (6.18)*/**	0.68 (1.28)	1.74 (2.90)	1.35 (2.47)**
Body dissatisfaction	14.73 (8.30)	9.91 (6.24)	10.72 (7.44)*/***	13.95 (7.51)	19.30 (7.90)*/**	17.30 (8.16)	4.31 (4.55)	8.89 (7.22)	7.17 (6.72)**/***

* Tukey's *post hoc* test difference between Eating Disorder and Trans: $p<0.05$

** Tukey's *post hoc* test difference between Eating Disorder and Controls: $p<0.05$

***Tukey's *post hoc* test difference between Trans and Controls: $p<0.05$

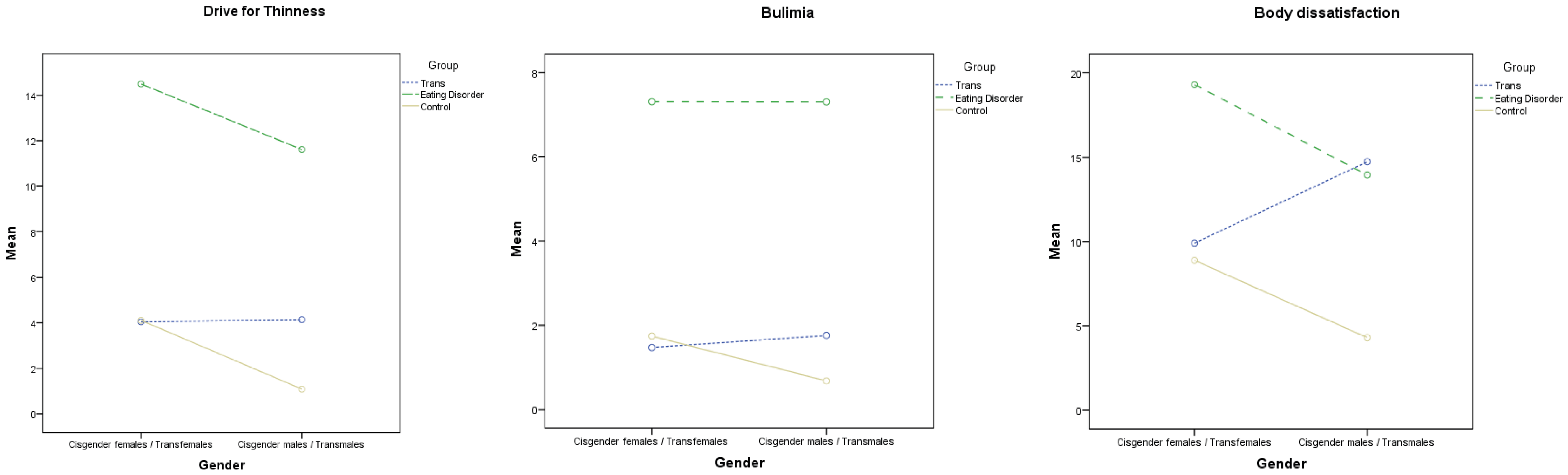

Figure 1 (a) Eating Disorders Inventory-2 drive for thinness scores for each of the three groups matched on identified gender, (b) Eating Disorders Inventory-2 bulimia scores for each of the three groups matched on identified gender, (c) Eating Disorders Inventory-2 body dissatisfaction scores for each of the three groups matched on identified gender

Aim 2: body dissatisfaction comparison between trans males and trans females

In order to further explore whether the root of body dissatisfaction differs between trans participants, all were asked to complete the Hamburg Body Drawing Scale (HBDS) [Appelt and Strauß, 1988]. The analysis revealed no significant differences between trans males and trans females in their dissatisfaction with specific body parts, and overall dissatisfaction was similarly high in both groups (mean = 4.06 in trans females (*SD*=0.88) and trans males (*SD*=0.91). The parts of the body that caused most dissatisfaction (mean of 3.5 or above) were as follows: beard, body hair, skin, Adam's apple, chest/breast, stomach, waist, hips and bottom.

Discussion

Previous studies have investigated body dissatisfaction in trans individuals. Although those studies were limited by the lack of matched controls [Khoosal et al., 2009], diagnostic tools [Vocks et al., 2009] and the small number of individuals involved in the project [Murray et al., 2013], they confirmed that trans individuals experience high levels of body dissatisfaction, that can be alleviated somewhat by beginning the process of physical transitioning to the gender which matches their internal identity. On the surface, this is perhaps not surprising because transsexualism is defined by a feeling that one's body is not in line with one's experienced gender, and as a consequence is a cause of distress and dissatisfaction [ICD 10; World Health Organization, 1992]. Previous studies have concluded that trans individuals may be at an increased risk of developing eating disorders compared with the general population because of their higher levels of body dissatisfaction [Cuzzolaro et al., 2006; Vocks et al., 2009]. However, the source of the dissatisfaction is likely to be important in predicting whether this dissatisfaction is manifest in eating disordered behaviours. For example, dissatisfaction with hair is unlikely to be a risk factor for dietary restriction, whereas dissatisfaction with thighs may be.

The findings support previous research, which has reported that trans individuals do not score as highly as those with clinical eating disorders but that they may exhibit some greater eating disorder-related symptomology compared to controls [Vocks et al., 2009]. On the measure of body dissatisfaction, not only did the eating disorder group score higher than the trans and control groups, but the trans groups also scored higher than the control group. Furthermore, trans males had similarly high scores on body dissatisfaction as eating disordered males. The significant interaction indicated that body dissatisfaction is associated with being assigned female at birth (cisgender females and trans males). Therefore, while dissatisfaction tends to be higher in cisgender females than cisgender males, it is higher in trans males than it is in trans females (and as stated previously, at a level comparable with males with eating disorders). This confounds findings from the eating disorder field, where females show higher levels of body dissatisfaction than males [Nuñez-Navarro et al., 2012] and may point to protective effects of socialisation in a male role (trans females), or possibly some protective biological factor associated with being assigned male at birth.

Regarding drive for thinness and bulimia, trans and control individuals did not differ. However, higher scores in drive for thinness were associated with being female in the control and eating disorder group (with females scoring higher than males), but in the trans group there was little difference between desired genders; both trans males and trans females showed very similar levels of drive for thinness, which were comparable with cisgender females and higher than what is seen in cisgender males. This suggests that a female identity, by birth or by desire, may be a risk factor. Trans females may internalise the same ideals that natal females do with regard to the ideal female body [Hoek, 1993; Witcomb et al., 2013] while trans males may still be influenced by such cultural aspects of being female, despite desiring to be male.

When using the HBDS to assess dissatisfaction with specific body parts, no significant differences were found between trans males and trans females. The body parts that were reported to cause the most dissatisfaction were those associated with body shape and those that could be considered to be associated with as attaining the outward appearance of the gender the person experiences themselves as. Dissatisfaction with body shape (stomach, waist, hips and bottom) may, on the surface, suggest a risk for the development of eating disorders since the dissatisfaction is rooted in aspects of the body that could be changed by dietary restriction. Consequently, both groups had near identical levels of drive for thinness. However, how this is manifest in eating behaviour may differ between trans males and trans females. In light of the association between being male and having greater muscle mass, it may be that some trans males will be at risk for other types of body image-related behaviours, such as body building and excessive exercise and the development of symptoms of muscular dysmorphia or dysmorphic disorders [Nieuwoudt et al., 2012]. This is well documented in the cisgender population with sociocultural messages promoting becoming muscular, predicting compulsive exercise in boys [Goodwin et al., 2014]; and indeed body building, at extreme levels, has been termed 'bigorexia' [Mosley, 2009]. Relatedly, for trans females, the influence of desired gender on drive for thinness may reflect what is seen in the general population, with some trans females internalising the same ideals that some cisgender females do with regard to the ideal female body, possibly because their female identity has been present for many years (reflected in the older age of the trans females attending clinic) [Hoek, 1993; Witcomb et al., 2013]. There may also be a drive for thinness in a way that is quite specific to some trans people, by virtue of wanting to suppress features of the birth assigned gender and to accentuate the features of the identified gender, as suggested by Algars et al [2012].

The influence of birth assigned gender on body dissatisfaction is more complex, with all birth assigned females (cisgender females and trans males) exhibiting greater levels of dissatisfaction than birth assigned males (cisgender males and trans females). When looking at dissatisfaction with specific parts of the body, there were no differences between trans males and trans females, but the parts of the body that caused the most dissatisfaction in both groups were those physical attributes that may most likely identify them as being trans, that is, beard, body hair, skin, Adam's apple, chest/breast.

There are aspects of the study that warrant attention in relation to limitation of the results. Firstly, this study compared trans patients and eating disorder patients from NHS Clinics. Therefore, the data represent clinical cases only and cannot be generalised to those individuals who are unwilling or unable to seek help and who are not within the NHS healthcare system. Furthermore, since this study investigated body dissatisfaction in trans individuals at the start of their transition, the pattern of results found here should not be generalised to all trans people, particularly those who have begun to undergo some physical transitions with the use of hormones. In addition, the cross-sectional nature of this research means that changes in body dissatisfaction over time and throughout the transitioning / treatment process cannot be assessed. Therefore, further research should aim to investigate the risk of developing an eating disorder in the trans population in a longitudinal study.

Second, there are additional questions that require investigation. For example, stress is considered to be a precipitating factor in eating problems such as binge eating [Degortes et al., 2014] and, as such, future work would benefit from an inclusion of an assessment of stress (related to being trans and to the transitional process) in order to investigate whether trans individuals are more or less at risk for binge eating because of increased levels of minority stress related to being a marginalised group [Hendricks and Testa, 2012]. Future work should also consider what role individual factors which have been shown to be associated with the development of eating disorders in cisgender populations such as perfectionism [Boone et al., 2014] or anxiety [Waller et al., 2013] also play a role in trans populations.

Finally, it is worth noting that all data were collected via self-report questionnaires (except diagnosis) and, as such, may be influenced by response bias. In addition, BMI was not recorded for all participants, which may have been interesting. Our main aim was to measure the levels of body dissatisfaction of trans people that traditionally attend Services. As such, we were keen not to introduce any measures that may reduce participation, because a large clinical sample of trans individuals is a real strength of the study. Although differences in BMI would clearly be present between eating disorder participants and the other two groups, there was no clinical reason to suggest that there would be BMI differences between trans and cis gender participants. However, we acknowledge that future studies would benefit from including a measure of BMI if possible.

Because research in this area is relatively new, the tools used to measure body dissatisfaction and eating disorder symptomology are not widely validated and nor have they been designed specifically for use in this population - leaving their reliability and, crucially, validity open to question. As such, future research with trans populations would benefit from the development of reliable, validated measures to assess eating behavior and body image.

Overall, this study has shown that taking account of gender identity is crucial in understanding how body dissatisfaction might manifest itself in different populations. Although the aetiology of eating disorders is multi-factorial and no one single element alone will precipitate an eating disorder, the results of this large, controlled study suggest that being birth assigned female (cis gender females and trans males) and desiring to be female (trans females) all carry a similar weight in terms of drive for thinness, which is greater than seen in non-trans, cisgender males. Most importantly, trans males show signs of body dissatisfaction that are comparable to those exhibited by males being treated for clinical eating disorders and so this group may be more at risk than trans females. Why this difference exists is unclear, but may be related to being birth assigned female and the socialisation effects on body image, or to the differences in the extent to which natal characteristics in each group are regarded. For example, trans males may find the presence of feminine buttocks and hips fundamentally more dissatisfying than trans females find their lack of them to be. Thus, there may be a gender difference with regards to how the different groups perceive their characteristics; as something to be removed as opposed to something to be added. However, how this dissatisfaction manifests in behaviour is as yet unknown and future research is needed to explore the eating and exercise behaviours of trans individuals.

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6.3. Study 3: Risk Factors for Non Suicidal Self Injury among Trans Youth

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ABSTRACT

Introduction: Previous research has reported high levels of non-suicidal self-injury (NSSI) in trans populations and younger age has been identified as a risk factor.

Aims: To explore the prevalence of NSSI in a large group of young trans people, and to identify risk factors for this group.

Main Outcome Measures: Socio-demographic variables and measurements of NSSI (Self-Injury Questionnaire), psychopathology (Symptom Checklist-90-Revised), self-esteem (Rosenberg Self-Esteem Scale), victimization (Experiences of Transphobia Scale), interpersonal functioning (Inventory of Interpersonal Problems) and social support (Multidimensional Scale of Perceived Social Support).

Methods: Two hundred and sixty-eight young people attending a national gender clinic completed questionnaires assessing presence and frequency of NSSI and levels of general psychopathology, depression, anxiety, interpersonal problems, self-esteem, social support, transphobia, and information on hormone treatment.

Results: A life-time presence of NSSI was identified in 46.3% of patients and 28.73%

reported currently engaging in NSSI (within at least the last few months). Analyses showed that those with a life-time presence of NSSI had significantly greater general psychopathology, lower self-esteem, had suffered more transphobia, and experienced greater interpersonal problems than those without NSSI. Findings were similar when comparing current with non-current NSSI. Overall, natal male patients reported less social support than natal female patients, but current NSSI was more common in natal female patients. Regression analyses confirmed that natal female gender and greater general psychopathology predicted current and life-time NSSI. Further analyses confirmed that general psychopathology itself could be predicted by transphobic experiences, low self-esteem, and interpersonal problems, but not by the use of cross-sex hormones.

Conclusions: These findings confirm that NSSI is common in trans youth and emphasise the need for interventions that decrease transphobia, increase social support, and help trans youth navigate their relationships with others to decrease psychopathology and NSSI.

Keywords: Gender Dysphoria; Trans; Transgender; Transsexual; Youth; Young People; Suicide; Non-suicidal Self-Injury; Psychopathology

Introduction

The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* uses the term *gender dysphoria* to describe people who present with high levels of distress caused by the discrepancy between their gender identity (how they see themselves with respect to their gender) and the sex they were assigned at birth (and the associated gender role and/or primary and secondary sex characteristic) [APA, 2013]. In some cases, this distress is sufficiently intense that people decide to undergo a transition from one point of the gender binary to another (male to female, known as trans women or trans female; or female to male, known as trans men or trans male). This diagnosis also recognizes those people who do not identify themselves as male or female and who see themselves as not part of the gender binary. Although over the years different terms have been used to describe people who present with a discrepancy and/or dysphoria about their gender, throughout this article the terms *trans people/individuals*, *trans women* and *trans men* are used, instead of using diagnostic terminology, to include people with sufficient levels of gender dysphoria to approach clinical services, independent of diagnosis.

Based on studies looking at individuals attending clinical services, the prevalence of trans people is not high [Arcelus, Bouman, Van Den Noortgate, Claes et al., 2015]. Population studies have suggested a significantly higher prevalence, although it remains unknown how many people who identify as trans go on to seek cross-sex hormone treatment (CST) and/or gender-related surgery [Kuyer & Wijsen, 2014; Van Canaegem et al., 2015]. Research has reported high levels of mental health problems, particularly depression and non-suicidal self-injury (NSSI), in the trans population [Claes, Bouman, Witcomb, Thurston et al., 2015; Clements-Nolle et al., 2001; Couch et al., 2007; Davey, Arcelus, Meyer, & Bouman, 2016; Hepp et al., 2005; Marshall, Claes, Bouman, Witcomb et al., 2016; Operario & Nemoto, 2005]. NSSI refers to the direct and intentional injury of one's own body tissue without suicidal intent, such as cutting, burning, and hitting oneself, and has been found to function as a way to regulate emotions and as a self-punishment [Claes & Vandereycken, 2007]. Studies investigating this behavior have interchangeably used different terms to define it, including *self-harm*, *self-cutting*, *self-injury*, and *NSSI*.

There is good evidence to suggest that levels of NSSI are considerably high in young people, ranging between 14% to 39% in the community and 40% to 61% in psychiatric samples [Muehlenkamp, Claes, Havertape et al., 2012; Nock & Prinstein, 2004]. Those studies also have identified that NSSI is higher in the lesbian, gay, bisexual, and transgender (LGBT) young population compared with the general population of young people [Mustanski & Liu, 2012]. Possibly because of the low prevalence of trans people, the numbers of studies that have included young trans people are very small. In many instances, researchers in this area have studied trans youth as part of the overall LGBT group. For example, Mustanski and Liu [2012] suggested that LGBT individuals are at greater risk for NSSI after they investigated a sample of 237 LGBT youths (age range = 16-20 years). However, this study included only 21 (8.8%) trans people and showed that 11 (52.4%) of them engaged in NSSI during their lifetime and four (19%) during the past year. Walls et al. [2010] also investigated trans youth as part of the LGBT group by researching 265 LGBT youths (age range = 13-22 years; 4.9% self-identified as trans). Their study found that 6 of the 13 trans youth (47.2%) who took part in the study stated that they had engaged in self-cutting behavior during the past year. More recent studies have investigated rates of NSSI in larger samples of trans people by focusing on those people who are referred to gender identity clinic services. Claes et al. [2015] recently reported a 38% lifetime prevalence of NSSI within this population. Although this study consisted of 155 trans individuals, the number of young people included remained small. Nevertheless, the study did identify that NSSI was more prevalent in younger people. Although all the aforementioned studies are limited by the small number of trans youth included, they clearly indicated an association between younger age and NSSI behavior in this population.

Studying the rates of NSSI in this vulnerable population is important because it aids the further understanding of this behavior. For example, identifying risk factors for NSSI might help the development of preventive interventions for this specific population. Risk factors for NSSI, which have been identified within the general, psychiatric and adult trans populations, include childhood traumatic experiences, psychological symptoms (particularly anxiety and depression), identity problems, levels of transphobia, interpersonal dysfunction and natal gender [Claes et al., 2015; Claes, Luyckx, Baetens et al., 2015; Davey, Bouman, Arcelus, & Meyer, 2015; Muehlenkamp, Ertelt, Miller et al., 2011; Nock, 2009; Young, Van Beinum, Sweeting et al., 2007]. Although in the general population, women are reportedly three to four times more likely to self-injure than men [Mental Health Foundation, 1997], in the trans literature, NSSI appears to be more common in trans men than trans women [Skagerberg, Parkinson, & Carmichael, 2013], suggesting that gender patterns of NSSI may align with individuals' birth sex rather than their experienced gender. Young age has been reported to be an important risk factor for NSSI in the trans population [Claes et al., 2015; Davey et al., 2016]. Hence, investigating NSSI behavior specifically in this group is important, as it might further identify risk and protective factors that can be modified, supported, treated or prevented.

Aims

This study had two main aims. The first was to investigate the rates of NSSI in young trans individuals referred to a national gender identity clinic service during a 30-month period. In accord with previous studies, young people were defined as younger than 25 years [Rowe et al., 2015; Young et al., 2007]. The second was to collect and analyze information regarding the possible risk factors for NSSI focusing on those previously described in the general and older trans populations, such as natal gender, general psychopathology, levels of depression, interpersonal problems, levels of self-esteem, social support, and transphobia experiences [Claes et al., 2015; Davey, Bouman, Arcelus, & Meyer, 2014, 2015; Muehlenkamp et al., 2011; Nock 2009]. The study aimed to compare these variables between young trans individuals who do and do not engage in NSSI, taking into account natal gender (male vs female) and the interaction between the presence or absence of lifetime and current NSSI and natal gender. Based on the literature regarding NSSI and trans, it was hypothesized that NSSI would be more prevalent in natal female youth and in those with higher levels of psychopathology, victimization (transphobia experience), interpersonal problems, low self-esteem and less perceived support from others [Claes, Bouman, Witcomb et al., 2015; Claes, Luyckx, Baetens et al., 2015; Davey, Arcelus, Meyer, & Bouman, 2016; Davey, Bouman, Arcelus, & Meyer, 2015; Muehlenkamp et al., 2011; Nock, 2009]. Related to this, this study also sought to identify what factors might predict lifetime and current NSSI and what factors predict general psychopathology (a known factor to predict NSSI).

Methods

Participants and Procedures

The sample consisted of all individuals younger than 25 years who were referred for an assessment to a national gender identity clinic service in the United Kingdom during a 30-month period from November 2012 through June 2015. The clinic is one of the largest of its kind in Europe and receives referrals of people with gender dysphoria older than 17 years directly from primary care. Every individual referred to the service for an assessment of gender dysphoria was included into the study.

Before the clinical assessment, every patient is invited to complete a battery of questionnaires to aid the assessment and diagnostic procedure and to assess suitability to enter into the treatment program. The assessment at the clinic consists of two appointments with independent senior clinicians with experience in transgender health. A third appointment with the two clinicians, the trans person and a significant other also is organized to explore and increase the social support of the individual and plan future care. After independent assessments and discussion within the multidisciplinary team, the person is considered for entry into the treatment program. Patients will usually commence CST, if there are no physical contraindications. For trans men, after a minimum of 6 months of living in their experienced gender role and being part of the treatment program, they are considered for chest reconstructive surgery. Genital reconstructive surgeries are generally available to trans people after being in the treatment program for a minimum of 18 months, if they so wish. Once trans people have undergone their desired treatment, follow-up care can be organized at the service, if they so wish [Wylie, Barrett, Besser, Bouman et al., 2014].

Although most trans people presenting to the service request CST to lessen their gender dysphoria and in some cases their body dysphoria, not all trans people desire or deem it necessary to have CST and not all trans people will request gender-related surgeries [Bockting, Coleman, & De Cuypere, 2011]. Because this clinic assesses only those older than 17 years, a large number of patients will have been referred from the only national clinic for child and adolescents with gender dysphoria in the United Kingdom. Therefore, by the time patients are referred to the adult gender identity clinic service, some young trans people will already have started CST or gonadotropin-releasing hormone analogue (GnRH-A) therapy. This information also is considered in the analysis to explore the effect of early intervention in NSSI behavior.

Main Outcome Variables

Self-Injury Questionnaire

The Self-Injury Questionnaire [Claes & Vandereycken, 2007] was used to assess self-injury. Participants were asked whether they had ever deliberately cut or hurt themselves in the form of burn, scratch, bruise, or bite (yes or no), and if they had, how long ago they last did this (in the past week, month, several months ago, more than a year ago, or never). This questionnaire has been used in the trans population [Claes et al., 2015; Davey et al., 2016].

Symptom Checklist-90-Revised

The Symptom Checklist-90-Revised (SCL-90-R) [Derogatis, 1992] assesses general psychopathology and provides a global score, referred to as the Global Severity Index (GSI). This is calculated from scores across nine primary symptoms dimensions: depression, anxiety, obsessive-compulsive, phobic anxiety, somatisation, interpersonal sensitivity, paranoid ideation, hostility, and psychoticism. This study used the GSI score and the depression and anxiety subscales because they have been found to be predictive factors in previous studies [Claes et al., 2015; Davey et al., 2016]. Higher scores indicate greater psychopathology. The SCL has good construct validity and reliability [Derogatis & Unger, 2010] and is applied widely in trans research [Claes, Bouman, Witcomb et al., 2015; Claes, Luyckx, Baetens et al., 2015; Davey, Arcelus, Meyer, & Bouman, 2016; Davey, Bouman, Arcelus, & Meyer, 2014, 2015]. The Cronbach α values for the present sample were .89, .93 and .97 for the anxiety and depression subscales and GSI, respectively.

Rosenberg Self Esteem Scale

The Rosenberg Self Esteem Scale (RSE) [Rosenberg, 1965] evaluates global self-esteem. Ten items produce a global score, which is considered in the normal range when 15 to 25. A global score lower than 15 indicates low self-esteem. The RSE has been empirically validated [Robins et al., 2001] and administered previously to trans individuals [Skrapec & MacKenzie, 1981]. The Cronbach α for the total RSE in the present sample was 0.9.

Experiences of transphobic victimisation.

The Experiences of Transphobia Scale [Lombardi et al., 2001] assesses experiences of discrimination or victimization based on gender identity or gender presentation. The questionnaire was based on the Transgender Violence Study and measured people's lifetime experiences of violence and harassment and experiences of any form of economic discrimination as a result of being trans (eg, verbal abuse, physical abuse, fired from a job, problems getting a job, and problems getting health or medical services owing to gender identity or presentation). All five items are to be rated on a four-point Likert scale ranging from 0 (never) to 3 (several times). The Cronbach α for this scale in the present sample was 0.61.

Inventory of Interpersonal Problems

The Inventory of Interpersonal Problems (IIP) [Barkham et al., 1996] assesses common interpersonal problems, across eight subscales: hard to be assertive, hard to be sociable, hard to supportive, hard to be involved, too dependent, too caring, too aggressive, and too open. The subscales are grouped into four items: problems with competition, problems with socialising, problems with nurturance, and problems with independence. A global score provides an indication of overall interpersonal problems, where higher scores indicate greater interpersonal problems. The IIP has demonstrated high reliability [Barkham et al., 1996] and has been applied in non-clinical [Berry et al., 2006] and clinical samples [Arcelus, Whight, Langham et al., 2009; Davey, Bouman, Arcelus, & Meyer, 2015]. The Cronbach α ranged from 0.74 to 0.90 in this group.

Multidimensional Scale of Perceived Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS) [Zimet et al., 1990] is a 12-item, self-report scale designed to tap social support from family, friends, and significant others. Items are rated on a seven-point Likert scale from 1 (very strongly agree) to 7 (very strongly disagree). The instrument includes three subscales to address these three types of support (family, friends, significant others). The mean total and subscale scores range from 1 to 7, and a higher score indicates greater perceived social support. This scale has recently been used in trans populations [Davey et al., 2014]. The Cronbach α for the subscales and the total MSPSS ranged from 0.89 to 0.94.

Analyses

All data analyses were performed using SPSS 22 [IBM, 2013]. The groups were analyzed primarily by comparing individuals with life-time presence and absence of NSSI. Individuals were grouped in the category of lifetime presence of NSSI if they replied yes to the question, "Have you ever deliberately cut or hurt yourself?" Participants also were grouped into non-current NSSI (never NSSI and > 1 year ago) and current NSSI to assess differences based on how recent NSSI occurred. To determine the prevalence (lifetime and current) of NSSI and its characteristics, descriptive statistics were used. To investigate the association between NSSI (current and lifetime) and natal gender, the χ^2 statistic was calculated. Multivariate analyses of variance were applied with psychological symptoms, victimization, interpersonal problems, and social support as dependent variables and the presence or absence of lifetime or current NSSI and natal gender (men or women) and their interactions as independent variables. Similar analyses were performed to compare the two groups that were part of the non-current NSSI group (participants who never engaged in NSSI vs those who performed NSSI > 1 year ago). Furthermore, logistic regression analyses were performed to investigate which variables predicted lifetime NSSI and current NSSI in trans participants when taking all variables into account. Linear regression analysis was performed to investigate which factors determined the general level of psychopathology. The level of significance used was a P value less than .05. The study received ethical approval from the Research and Development Department from the Nottinghamshire Healthcare NHS Foundation Trust (Nottingham. UK) on behalf of the local ethics committee in line with Health Research Authority guidance [HRA, 2013].

Results

Socio-demographic characteristics of the sample

During the studied period, 299 patients younger than 25 years who were referred to the service and offered an assessment were invited to participate in the study. It is extremely rare that the service does not accept a referral for an assessment for gender dysphoria. Out of the 299 patients, 31(10.3%) did not answer the question regarding NSSI behavior and thus were excluded. Therefore, the study group consisted of 268 young people with a mean age of 19.9 years (SD = 2.17). The mean age of coming out to others as trans was 16.9 years (SD = 3.33) and the mean age of social role transitioning was 17.56 years (SD = 3.16).

Of the 268 people, 121 (45.2%) described themselves as natal female and 136 (50.7) as natal male. Eleven (4.1%) did not answer this question. Most of the population studied were white (n=241, 89.9%), student (n=90, 33.6%) or unemployed (n=49, 18.3%), and without a partner (n=241, 89.9%); one fourth were living with their family of origin (n=67, 25%). A small number of people (n=53, 19.8%) were on cross-sex hormones (n=11, 2.8%) and 42 (15.6%) were on GnRH-A therapy before assessment (Table 1 presents all demographics).

More than half the people (n=144, 53.7%) reported absence of lifetime NSSI, whereas 124 (46.3%) reported lifetime NSSI. By grouping patients differently, 191 patients (71.3%) presented with non-current NSSI (never, n=144; > 1 year ago, n=47) and 77 (28.7%) presented with current NSSI. Of the 124 young people who reported NSSI, 32 (25.8%) did so less than a week, 16 (12.9%) less than a month, 29 (23.0%) a few months, and 47 (37.9%) more than a year previous to the completion of the questionnaires.

A large majority of individuals who reported a lifetime NSSI cut themselves (n=73, 57.9%), 23 (18.2%) punched a wall or hit an object, 11 (8.7%) scratched themselves, 10 (7.9%) burned themselves, 6 (4.7%) banged their head, and 4 (3.1%) bit themselves. The type of NSSI was similar when investigating current NSSI. Several people reported to use more than one form of NSSI. Eight people reported cutting or burning their breast; none reported NSSI of their genitalia.

Absence vs Life-time NSSI

When comparing people with lifetime NSSI with people with lifetime absence of NSSI, the study found a nearly significant difference in natal gender ($\chi^2(1) = 3.53$, $P < .06$), with a tendency toward natal female patients (n=64) displaying more NSSI compared to natal male patients (n=56; Table 1).

Table 1. Sociodemographic Characteristics of the Studied Population for Lifetime NSSI (N=268)

	Total, n (%)	**No NSSI, n (%)**	**Lifetime NSSI n (%)**
Age (y), mean	19.9	19.9	19.9
Natal gender			
Female	121 (45.2)	57 (47.1)	64 (52.9)
Male	136 (50.7)	80 (58.8)	56 (41.2)
Did not respond	11 (4.1)		
Ethnic origin			
White	231 (86.2)	124 (53.6)	107 (46.4)
Indian	3 (1.1)	1 (33.3)	2 (66.7)
Black other	8 (3)	7 (87.5)	1 (12.5)
Pakistani	2 (0.7)	1 (50)	1 (50)
Other	24(9)	18 (75)	6 (25)
Employment status			
Student	90 (33.6)	52 (57.8)	38 (42.2)
Unemployed	49 (18.3)	30 (61.2)	19 (38.8)
Employed	30 (11.2)	17 (56.7)	13 (43.3)
Volunteer work	4 (1.5)	1 (25)	3 (75)
Disabled	4 (1.5)	3 (75)	1 (25)
No answer	91 (33.9)	46 (50.5)	45 (49.5)
Civil status			
Single, never married	241 (89.9)	132 (54.8)	109 (45.2)
Married	1 (0.4)	1 (100)	0 (0)
Civil partnership	1 (0.4)	0 (0)	1 (1)
Separated/divorced	4 (1.5)	3 (75)	1 (25)
In a relationship	9 (3.4)	3 (33.3)	6 (66.7)
Other	12 (4.4)	5 (41.6)	7 (58.3)
Living situation			
With family of origin	67 (25)	37 (55.2)	30 (44.8)
Alone	7 (2.6)	5 (71.4)	2 (28.6)
Shares with non-partner(s)	12 (4.5)	6 (50)	6 (50)
With partner only	1 (0.4)	0 (0)	1 (100)

Other/University halls/Friends	181 (67.5)	106 (58.6)	75 (41.4)
Use of hormones or blockers			
No	179 (66.8)	98 (54.7)	81 (45.3)
Yes	53 (19.8)	29 (54.7)	24 (45.3)
Did not answer	36 (13.4)	22 (61.1)	14 (38.9)

With respect to clinical psychopathology (SCL-90), and more specifically anxiety, depression, and GSI, a significant main effect was found for lifetime NSSI (Wilks λ= 0.93, *F*(3,225) = 5.48, *P* < .01), but no significant main effect for natal gender (Wilks λ = 0.99, *F*(3,225) = 1.07, not significant), or a significant interaction (Wilks λ = 0.98, *F*(3,225) = 1.26, not significant). Patients with lifetime NSSI scored significantly higher on the GSI compared with patients without NSSI (Table 2). Concerning self-esteem (RSE), there was a significant main effect of lifetime presence vs absence of NSSI, but no main natal gender or interaction effect. Patients with lifetime NSSI scored significantly lower on self-esteem compared with patients without NSSI (Table 2).

With respect to transphobic experiences, only a significant main effect for lifetime presence vs absence of NSSI was found, with no main effect of gender or interaction found. Concerning interpersonal difficulties, overall, no significant main effects for lifetime presence vs absence of NSSI (Wilks λ = 0.96, *F*(5,234) = 1.73, not significant) or natal gender (Wilks λ = 0.97, *F*(5,234) = 1.03, not significant) were found, or for their interaction (Wilks λ = 0.98, *F*(5,234) = .95, not significant) significant. On the subscale level, patients with NSSI found it harder to be supportive and reported more interpersonal problems in general (IIP total) than patients without NSSI, and natal male patients found it harder to be sociable compared to natal female patients (Table 3).

Concerning social support (MSPSS), there was a significant main effect of natal gender (Wilks λ = 0.94, *F*(3,249) = 4.95, *P* < .01), but no main effect of NSSI (Wilks λ = 1.00, *F*(3,249) = 0.01, not significant) or a significant interaction [Wilks λ = 0.99, *F*(3,249) = 0.55, not significant. Natal male patients reported that they perceived less social support from significant others, and in general, compared with natal female patients (Table 3).

Table 2. Mean (SD) on the SCL-90-R and RSE by Natal Gender (M vs F) and Lifetime NSSI (Present vs Absent)

	Male				Female				F Natal Gender M vs F	F NSSI NO vs YES	F Natal Gender M vs F * NSSI
	NSSI = 0		NSSI = 1		NSSI = 0		NSSI = 1				
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*			
SCL-90-R											
Depression	.31	.84	.50	1.23	.16	.63	.25	.71	2.88	1.47	0.15
Anxiety	.47	.98	.58	1.14	.32	.69	.69	1.20	0.01	3.04	0.85
GSI	.96	.70	1.20	.77	.77	.65	1.27	.69	0.42	15.64***	1.88
RSE											
Total	13.95	5.53	13.16	6.49	15.60	7.00	11.71	5.27	0.01	9.24**	4.07

F = female; GSI = Global Severeity Index; M = male; NSSI = non-suicidal self-injury; RSE = Rosenberg Self-Esteem Scale; SCL-90-R = Symptom Checklist-90-Revised.

*p < .05 , **p < .01, ***p < .001

Table 3. Mean (SD) on Experiences of Transphobia Scale, IIP, and MSPSS of Natal Men and Women With and Without Lifetime NSSI

	Male				Female				F Natal M/F	F NSSI NO/YES	F Natal M/F * NSSI
	NSSI = 0		NSSI = 1		NSSI = 0		NSSI = 1				
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*			
Transphobia											
Total	2.11	(2.12)	3.38	(2.99)	2.37	(2.31)	2.60	(2.33)	0.72	5.97*	2.82
IIP											
Problems Competition	.84	(1.18)	.73	(.92)	.52	(.91)	.90	(1.16)	0.27	0.93	2.94
Problems Socializing	1.72	(1.36)	1.86	(1.35)	1.35	(1.33)	1.44	(1.25)	5.19*	0.45	0.03
Problems Nurturance	1.21	(1.35)	1.52	(1.36)	1.01	(1.14)	1.44	(1.32)	0.67	4.72*	0.10
Problems Independence	-.25	(1.13)	-.46	(1.02)	-0.28	(1.03)	-.14	(1.23)	0.99	0.05	1.52
Total	1.37	(0.63)	1.51	(0.64)	1.21	(0.63)	1.49	(0.50)	1.14	6.99**	0.85
MSPSS											
Significant others	18.62	(7.99)	18.95	(7.12)	22.18	(6.46)	22.05	(5.96)	14.12***	0.01	0.06
Family	16.75	(6.95)	17.89	(6.54)	18.49	(6.23)	17.59	(7.32)	0.69	0.02	1.41
Friends	19.28	(6.27)	18.96	(6.52)	19.72	(6.61)	19.98	(6.79)	0.78	0.00	0.12
Total	54.65	(16.71)	55.80	(14.83)	60.39	(13.83)	59.62	(13.38)	6.43*	0.01	0.26

F = female; IIP = Inventory of Interpersonal Problems; M = male; MSPSS = Multidimensional Scores of Perceived Social Support; NSSI = non-suicidal self-injury; Transphobia = Experiences of Transphobia Scale.

*p < .05 , **p < .01, ***p < .001

Current vs Non-Current NSSI

Of of the 268 people studied, 191 (71.3%) presented with non-current NSSI and 77 (28.73%) with current NSSI. When analyzing the differences between young trans people with current and non-current NSSI, the pattern of findings were very similar to those reported earlier, with greater significance values in many cases. Although the difference in the numbers of natal male and natal female patients engaging in lifetime NSSI just missed significance, significantly more natal female patients (n=45) were currently engaging in NSSI than natal male patients (n=30; $\chi^2(1) = 7.09$, $P < .01$).

The results of the different measurements also were similar. With respect to clinical psychopathology (SCL-90), a significant main effect was found for current NSSI (Wilks $\lambda = 0.91$, $F(3,225) = 7.59$, $P < .001$), but not for natal gender (Wilks $\lambda = 0.99$, $F(3,225) = 1.06$, not significant) and their interactions (Wilks $\lambda = 0.99$, $F(3,225) = 0.61$, not significant). Patients with current NSSI scored significantly higher on the anxiety subscale and the GSI compared with patients without current NSSI (Table 4). As predicted, we found a significant main effect of current presence vs absence of NSSI, but no main natal gender or interaction effect regarding self-esteem (RSE). Patients with current NSSI scored significantly lower on self-esteem compared with patients without current NSSI (Table 4).

The study also found no significant main effects for presence vs absence of current NSSI and natal gender when assessing transphobic experiences and no significant interaction effect. With respect to interpersonal difficulties, overall, we found a significant main effect for presence vs absence of current NSSI (Wilks $\lambda = 0.94$, $F(5,234) = 2.77$, $P < .05$), but no significant main effect of natal gender (Wilks $\lambda = 0.97$, $F(5,234) = 1.31$, not significant) or a significant interaction effect (Wilks $\lambda = 0.98$, $F(5,234) = 0.61$, not significant). Patients with current NSSI find it harder to be supportive and reported more general interpersonal problems than patients without NSSI. Concerning social support, we found a significant main effect of natal gender (Wilks $\lambda = 0.94$, $F(3,249) = 4.93$, $P < .01$), but no main effect of current NSSI (Wilks $\lambda = 0.99$, $F(3,249) = 0.31$, not significant) or a significant interaction effect (Wilks $\lambda = .99$, $F(3,249) = 0.28$, not significant). Compared with natal female patients, natal male patients reported that they perceived less social support, in general and from significant others (Table 5).

Table 4. Mean (SD) on the SCL-90-R and RSE by Natal Gender (M vs F) and Current NSSI (Present vs Absent)

	Male				Female				F	F	F
									Natal Gender M/F	NSSI NO/YES	Natal Gender M/F * NSSI
	NSSI = 0		NSSI = 1		NSSI = 0		NSSI = 1				
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*			
SCL-90-R											
Depression	.33	(.89)	.57	(1.34)	.16	(.60)	.30	(.79)	3.00	2.16	.16
Anxiety	.40	(.90)	.89	(1.37)	.35	(.78)	.80	(1.26)	.21	10.06**	.02
Global Severity Index (GSI)	.97	(.71)	1.34	(.76)	.83	(.64)	1.38	(.71)	.25	20.32***	.68
RSE											
Total	14.29	(5.80)	11.33	(5.92)	14.67	(6.81)	11.64	(5.25)	0.16	12.42***	0.00

F = female; GSI = Global Severity Index; M = male; NSSI = non-suicidal self-injury; RSE = Rosenberg Self-Esteem Scale; SCL-90-R = Symptom Checklist-90-Revised.

$*P < .05$, $**P < .01$, $***P < .001$

Table 5. Mean (SD) on the Experiences of Transphobia Scale, IIP, and MSPSS of Natal Men and Women With and Without Current NSSI

	Male				Female				F Natal M/F	F NSSI NO/YES	F Natal M/F * NSSI
	NSSI = 0		NSSI = 1		NSSI = 0		NSSI = 1				
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*			
Transphobia											
Total	2.50	(2.28)	2.48	(2.41)	2.38	(2.53)	3.55	(2.58)	1.89	2.77	2.99
IIP											
Problems Competition	.80	(1.12)	.78	(.91)	0.60	(0.97)	.93	(1.18)	0.02	1.00	1.19
Problems Socializing	1.71	(1.36)	2.03	(1.31)	1.42	(1.34)	1.37	(1.19)	6.18*	0.51	0.96
Problems Nurturance	1.19	(1.33)	1.89	(1.34)	1.05	(1.20)	1.55	(1.29)	1.57	10.43***	0.29
Problems Independence	-.30	(1.07)	-.46	(1.17)	-.21	(1.14)	-.20	(1.15)	1.20	0.20	0.27
Total	1.36	(0.62)	1.66	(0.63)	1.28	(.61)	1.50	(.51)	1.90	8.61**	0.23
MSPSS											
Significant others	19.06	(7.52)	17.70	(7.99)	22.30	(6.33)	21.77	(5.95)	13.91***	.92	.17
Family	17.16	(6.93)	17.43	(6.36)	18.33	(6.39)	17.48	(7.52)	.40	.09	.34
Friends	19.28	(6.31)	18.70	(6.58)	19.83	(6.70)	19.91	(6.71)	.92	.07	.12
Total	55.50	(16.03)	53.83	(15.69)	60.46	(13.24)	59.16	(13.17)	6.06*	.50	.00

F = female; IIP = Inventory of Interpersonal Problems; M = male; MSPSS = Multidimensional Scores of Perceived Social Support; NSSI = non-suicidal self-injury; Transphobia = Experiences of Transphobia Scale. $*P < .05$, $**P < .01$, $***P < .001$

Never NSSI vs. NSSI More Than 1 Year Ago

In our sample, 144 participants (75.4%) never engaged in NSSI, whereas 47 (24.6%) engaged in NSSI more than 1 year ago. No significant differences were found between the two groups except for self-esteem and transphobia experiences. In natal female patients, participants who never engaged in NSSI reported a significant higher level of self-esteem compared with participants who engaged in NSSI more than 1 year ago ($F(1,175) = 5.57$, $P < .05$), whereas in natal male patients, this difference was not significant. With respect to transphobic experiences, participants who engaged in NSSI more than 1 year ago reported more transphobic experiences compared with participants who never engaged in NSSI ($F(1,178) = 3.64$, $P = .058$).

Risk Factors of Current and Lifetime NSSI

Two logistic regression analyses were conducted to determine which factors (gender, SCL-90 GSI, RSE, transphobia, IPP total) were the best predictors of the presence vs absence of current NSSI and lifetime NSSI. The results showed that the presence vs absence of current and lifetime NSSI was predicted by the biological sex of the patient (ie, being natal female), followed by the general severity of the clinical symptomatology (Table 6).

Predictors of General Psychopathology

To identify factors that could help the development of focused interventions aimed at preventing NSSI in the young population and because the main predictors of this behavior were gender and clinical symptomatology, the final aim was to investigate which factors were predictors of levels of general psychopathology (SCL-90 GSI).
Gender, self-esteem (RSE), transphobia, interpersonal problems (IIP total), and social support (MSPSS total) were included. This analysis also included whether patients had received CST or GnRH-A therapy before assessment as predictors. The results showed that transphobia experiences ($\beta = 0.18$, $P < .001$), low self-esteem ($\beta = -0.29$, $P < .001$), and interpersonal problems (IIP total; $\beta = 0.48$, $P < .001$) were the significant predictors for psychopathology in this population and explained 62% of the variance in GSI.

Discussion

This study aimed to explore the prevalence of NSSI in a sample of young trans individuals because previous research in the general population has identified being

Table 6. Logistic Regressions with Presence vs Absence of Lifetime and Current NSSI as Dependent Variables and Gender, Clinical Symptom Severity, Self-Esteem, Transphobia and Interpersonal Problems as Independent Variables

	Current NSSI (presence/absence)			Life-time NSSI (presence/absence)		
	Beta	S.E.	Exp(B)	Beta	S.E.	Exp(B)
Gender	-.72	.32	.49*	-.56	.29	.57*
SCL-90 GSI	.71	.35	2.04*	.63	.33	1.87 (*p*=0.059)
RSE	-.04	.04	.96	-.02	.03	.98
Transphobia	.02	.07	1.02	.08	.06	1.08
IIP-Total	-11	.40	.90	-.06	.36	.94
Constant	. 01	.93	.99	.14	.85	1.15

IIP = Inventory of Interpersonal Problems; NSSI = non-suicidal self-injury; RSE = Rosenberg Self-Esteem Questionnaire; SCL-90-R GSI = Symptom Checklist-90-Revised General Severity Index; SE = standards error; Transphobia = Experiences of Transphobia Scale. Gender (1 = female, 2 = male)

**p* < .05 , ***p* < .01, ****p* < .001

young and trans as a risk factor for NSSI [Claes et al., 2015; Davey et al., 2016; Plener et al., 2009). However, to date, no study has explored NSSI in a large sample limited to only young trans people.

The results of this study confirm that nearly half of the young people who were referred to a clinic for people with gender dysphoria had a history of engaging in NSSI and more than one fourth of them engaged in this behavior in the past year. Although the data for lifetime presence of NSSI showed no significant difference between genders (although there was a trend for increased rates in natal female patients), the prevalence of current NSSI was significantly greater in natal female patients (trans men). This gender bias is in line with previous findings [Davey et al., 2016] and could indicate that expressions of distress follow the pattern according to birth gender. Although there was no difference in levels of psychopathology between genders, the fact that natal female patients reported significantly more NSSI than natal male patients also might be reflective of patterns of typically natal feminine and masculine coping strategies [Davey et al., 2015].

In addition to natal gender, this study aimed to identify those factors that might be associated with and predict NSSI in young trans people. General psychopathology was found to predict current engagement in NSSI in addition to a natal female sex (trans man). The minority stress model described by Meyer [1995] explains that stress that particular minority groups (eg, LGBT people) can experience is due to the relationship between minority and dominant values, which results in conflicts with their social environment. This model suggests that stress in specific minority groups can largely be explained by stressors induced by a hostile, transphobic culture, which often results in a lifetime of harassment, abuse, victimization, and discrimination [Meyer, 2003]. This explains why levels of transphobia were predictive of psychopathology and were more common among the NSSI group. Decreasing the levels of transphobia experience, which in young people is usually experienced as bullying in schools, colleges, and university environments, should be a primary target toward improving the life of trans people. General public-focused campaigns and interventions that increase awareness of trans and gender non-conformity and de-stigmatization of being trans are needed to lessen wide-ranging discrimination. Starting such education within schools, colleges, and universities could be a valuable first step toward preventing victimization among people with gender dysphoria, which could help decrease victimization and therefore psychopathology and NSSI rates.

The study also found that natal male patients (trans women) had higher levels of interpersonal problems. In particular, they were found to have difficulties being supportive and they perceived themselves as having less social support than natal female patients. This is a pattern previously found in the general population of natal men [Davey et al., 2014]. Social support has been considered vital for a positive outcome among trans people; however, this study did not find that levels of social support predicted NSSI engagement or psychopathology, which differ from findings from older trans groups [Claes, Luyckx, Baetens et al., 2015]. Although a supportive environment is important for any individual, the lack of association with psychopathology could be a reflection of the high levels of social support that young people referred to the clinic had, in some cases possibly related to the supportive interventions received from previous child and adolescent services, which many of those referred to our clinic had experienced. Interestingly, receiving CST or GnRH therapy was not predictive of less NSSI behavior or psychopathology. Therefore, supportive family interventions could demonstrate an improvement in outcome. Future preventative interventions might need to consider the need to work with families of young people to decrease psychopathology.

The study found that general interpersonal problems and low levels of self-esteem were associated with NSSI and predictive of psychopathology. Difficulties in being supportive and overall interpersonal problems were higher in those with a lifetime presence and current NSSI compared with those with an absence of NSSI, which could suggest that trans youth who self-harm might be more isolated that those who do not. The association between interpersonal problems and psychopathology and NSSI has been found in the general population and in studies in adult trans people [Davey et al., 2014]. This association indicates the importance of clinically addressing these difficulties through treatment modalities aiming at decreasing interpersonal problems, for instance by using treatments such as interpersonal psychotherapy (IPT) [Klerman et al., 1984]. IPT has been found to alleviate depression by improving interpersonal problems [Ravitz et al., 2007]. Because IPT has been successfully applied in various populations, including adolescents and young adults [Hara et al., 2000; Mufson et al., 2013], IPT could be adapted for use within the trans population [Budge, 2013]. IPT also can help people to develop new ways to deal with negative emotions and therefore lower NSSI rates. Studies investigating the functions of self-injury have found that the etiology of NSSI is related to a suppression of negative thoughts and images, followed by punishing oneself [Claes, Bouman, Witcomb et al., 2015; Claes & VanderEycken, 2007]. Working with young people aiming at developing healthy ways of dealing with their negative emotions is important. Healthy and common coping skills used in the general cis population, such as sport, might be limited for the trans population owing to the barriers that they can encounter in those environments. The promotion of healthy environments for young trans people is important and future studies might need to explore the barriers that many young trans people find when accessing environments known to help people to deal with negative emotions.

It is expected that the 11th edition of the *International Classification of Diseases* will remove the diagnosis of transsexualism/gender identity disorder and replace it with the new diagnostic term of *gender incongruence*. It also is expected that this diagnosis will be moved from the chapter on mental and behavioral disorders to a new chapter (conditions related to sexual health) [Drescher, Cohen-Kettenis, & Winter, 2012]. For a person to fulfill this new diagnosis, the distress or impairment of functioning will no longer be required [Drescher, Cohen-Kettenis, & Winter, 2012]. The high level of psychopathology found in this study might question whether the removal of the "distress" requirement is right. The fact that transphobia experiences predicted NSSI could suggest that the minority stress model is a possible explanation for the distress found in people with gender dysphoria. In this case the need to remove the "distress' requirement from the 11th edition of the ICD seems appropriate. However, the distress described by people with gender dysphoria is unlikely to be mono-causal. The strong desire to be treated as the other gender and/or to get rid of one's sexual characteristics is likely to manifest as distress, depression, anxiety or even suicidality. In those cases, the distress is closely connected with the unhappiness about one's assigned gender and it makes it impossible to disentangle this from the diagnosis. In those cases, this dysphoria might decrease after gender-confirming medical intervention. Studies investigating the role of gender-confirming medical intervention in people with gender dysphoria, despite their limitations, have overall demonstrated a decrease in levels of psychopathology after intervention [Dhejne, Van Vlerken, Heylens, & Arcelus, 2016]. Those studies have not focused on young people, who are at particular risk of reporting NSSI behavior. Future studies could follow young people with gender dysphoria after gender-confirming medical intervention to identify whether a decrease of their dysphoria is enough to lower rates of psychopathology and levels of NSSI or whether they require further interventions.

This study focused on a sample of trans people within a limited age range (17-25 years) and is to our knowledge one of the largest studies of this age group of trans youth.

Future studies need to explore NSSI in a younger population of trans youth, perhaps those attending clinics for the very first time, irrespective of age. The study also is limited by the fact that it included only a population of people referred to clinical services. It could be hypothesized that those not referred to services might have higher psychopathology and NSSI behavior and possibly less social support. Because the support of parents to attend services is important, those with poor support might not be referred to services and therefore are not represented in this study. The study also is limited by the lack of information regarding coming out and social transition stage (because it can influence psychopathology) and information regarding the diagnosis among the referred individuals. However, it was important for us to capture the levels of psychopathology of every young people referred to our clinical service because by definition these young people would present with dysphoria about their gender.

Conclusions

This study builds on previous research in the area of gender dysphoria and NSSI and confirms the predictive nature of psychopathology and gender in NSSI behavior. The study extends previous findings by identifying interpersonal problems, transphobia experiences and low self-esteem as predictors of psychopathology, which in turn predicts NSSI. Future research would benefit from investigating interventions aimed at improving psychopathology by decreasing interpersonal problems and improving self-esteem in this population. This study, once again, confirms the damage that victimization can do to people and the importance of targeting this.

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6.4. Study 4: Sociodemographic Variables, Clinical Features, and the Role of Preassessment Cross-Sex Hormones in Older Trans People

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ABSTRACT

Introduction: As referrals to gender identity clinics have increased dramatically over the last few years, no studies focusing on older trans people seeking treatment are available.
Aims: The aim of this study was to investigate the sociodemographic and clinical characteristics of older trans people attending a national service and to investigate the influence of cross-sex hormones (CHT) on psychopathology.
Methods: Individuals over the age of 50 years old referred to a national gender identity clinic during a 30-month period were invited to complete a battery of questionnaires to measure psychopathology and clinical characteristics. Individuals on cross-sex hormones prior to the assessment were compared with those not on treatment for different variables measuring psychopathology.
Main Outcome Measures: Sociodemographic and clinical variables and measures of

depression and anxiety (Hospital Anxiety and Depression Scale), self-esteem (Rosenberg Self-Esteem Scale), victimization (Experiences of Transphobia Scale), social support (Multidimensional Scale of Perceived Social Support), interpersonal functioning (Inventory of Interpersonal Problems), and nonsuicidal self-injury (Self-Injury Questionnaire).

Results: The sex ratio of trans females aged 50 years and older compared to trans males was 23.7:1. Trans males were removed for the analysis due to their small number (n=3). Participants included 71 trans females over the age of 50, of whom the vast majority were white, employed or retired, and divorced and had children. Trans females on CHT that came out as trans and transitioned at an earlier age, were significantly less anxious, reported higher levels of self-esteem, and presented with fewer socialization problems. When controlling for socialization problems, differences in levels of anxiety but not self-esteem remained.

Conclusion: The use of cross-sex hormones prior to seeking treatment is widespread among older trans females and appears to be associated with psychological benefits. Existing barriers to access CHT for older trans people may need to be re-examined.

Key words: Gender Dysphoria; Transsexualism; Ageing; Midlife and Beyond; Mental Health; Hormone Treatment; Self-Esteem; Social Support

INTRODUCTION

Trans people of all ages have been found to face a number of difficulties, including interpersonal challenges (such as disclosing their gender identity) [Bockting and Coleman, 2007]; discrimination and victimization [Lombardi et al., 2001]; low self-esteem [Erich et al., 2010]; body dissatisfaction [Witcomb et al., 2015]; rejection from family and loved ones [Koken et al., 2009]; and self-harming behavior [Claes et al., 2015; Marshall et al., 2016]. Some of those difficulties may be more prevalent among older trans people as ageism, discrimination in employment, lack of affordable housing, and lack of social and family support often beset older trans people [Davey et al., 2014; McNeil et al., 2012; Orel, 2014].

In contemporary Western societies, it is not unusual for trans people to present to a gender identity clinic service (GICs) at age 50 or older. Trans older adults have been largely invisible in existing ageing and health research [Bouman, 2013]. Generally subsumed under the broad umbrella of lesbian, gay, bisexual, and transgender (LGBT), there has been little information regarding how trans people differ from nontrans lesbian, gay, and bisexual people or how trans older adults differ from younger trans adults and cisgender (nontrans) older people [Fredriksen-Goldsen et al., 2013]. The literature that does exist deals mainly with the lack of adequate and appropriate services for older gender nonconforming and trans people [Witten and Eyler, 2012]. Barriers to health care are significant in this population due to shame, stigma, lack of educated caregivers, and lack of insurance [Coleman et al., 2012; Shires and Jaffee, 2015; Wylie et al., 2014]. This may increase the difficulties accessing services, forcing older trans people to self-medicate.

Studies investigating the use of cross-sex hormones treatment (CHT) prior to attending gender identity clinic services among trans people of all ages found that they most commonly obtain hormones via the Internet, which leaves these individuals without the knowledge to minimize health risks [Mepham et al., 2014; Kreukels et al., 2012; Simonsen et al., 2015]. Trans people who self-prescribe cross-sex hormones tend to be predominantly trans women and older when they present to gender identity clinic services and generally have poor knowledge of the side effects and risks associated with CHT [Mepham et al., 2014; Kreukels et al., 2012; Simonsen et al., 2015]. On the positive side, there is evidence that trans people of all ages who are taking CHT experience improved quality of life and less social distress, anxiety, and depression when compared to a population not on CHT [Gomez-Gil et al., 2012; Gorin-Lazard et al., 2012; Keo-

Meier et al., 2015]. However, most of the studies exploring the benefits of CHT are rarely controlled for other factors known to be associated with an increased psychopathology, such as social support [Davey et al., 2014] and interpersonal difficulties [Davey et al., 2015].

AIMS

This study had 3 main aims. The first was to describe the sociodemographic and clinical features of trans people over the age of 50 years referred to a national gender identity clinic service during a 30-month period. The second aim was to collect and analyze the use and the source of CHT prior to referral to a gender identity clinic service and to compare trans people who were using CHT prior to referral with those who did not. Based on the literature regarding CHT and trans people, it was hypothesized that the use of CHT will be more prevalent in trans females [Mepham et al., 2014; Kreukels et al., 2012; Simonsen et al., 2015] and associated with less anxiety and depression, fewer self-harming behaviors and discrimination, and increased self-esteem, social support, and interpersonal functioning [Gomez-Gil et al., 2012; Gorin-Lazard et al., 2012; Keo-Meier et al., 2015]. As an association has been found between socialization problems and psychopathology in trans people [Davey et al., 2014; Davey et al., 2015], the third aim of the study was to investigate whether differences in psychopathology between groups still remain when controlling for socialization problems.

METHODS

Participants and Procedures

The sample consisted of all individuals over the age of 50 who were referred for an assessment to a national gender identity clinic service in the United Kingdom during a 30-month period between November 2012 and June 2015.

Prior to the clinical assessment, every patient was invited to complete a battery of questionnaires to aid the assessment and diagnostic procedure. The assessment at the clinic consists of 2 appointments with independent senior clinicians with experience in the field of transgender health. A third appointment with the 2 clinicians, the trans person, and a significant other is also organized to explore and to increase the social support of the individual. Following independent assessments and discussion within the multidisciplinary team the person is considered for entry into the treatment program. Treatment, including cross-sex hormones and gender-related surgeries, is free at the point of access in the National Health Service (NHS) in the United Kingdom for all citizens. Patients will usually start CHT if there are no physical contraindications. Genital reconstructive surgeries are generally available to trans people after being in the treatment program for a minimum of 12 months. We acknowledge that not all trans people wish to take cross-sex hormones or undergo gender-related surgeries; a growing number of trans people express a wish for partial treatment [Beek et al., 2015]. Once trans people have undergone their desired treatment, follow-up care can be organized at the service, if they wish [Wylie et al., 2014].

The study received ethical approval from the Research and Development Department from the Nottinghamshire Healthcare NHS Foundation Trust on behalf of the local ethics committee in line with Health Research Authority guidance [Health Research Authority (HRA), 2013].

MAIN OUTCOME MEASURES

The *Hospital Anxiety and Depression Scale* (HADS) [Zigmond AS and Snaith RP, 1983] is a 14-item self-report screening scale originally developed to indicate the possible presence of anxiety and depression states in the setting of a medical nonpsychiatric outpatient clinic. HADS consists of two subscales, HAD-Anxiety (HAD-A) and HAD-Depression (HAD-D), each with seven items, rated on a 4-point Likert scale (ranging from [0], as much as I always do; [1] not quite so much; [2] definitely not so much; to [3] not at all), indicating either symptoms of anxiety or depression during the preceding week. A score of 0 to 7 on either scale is regarding as being in the normal range (no symptoms), a score of 8 to 10 is suggestive of the presence of a mood disorder (possible symptoms), and a score of 11 or higher indicates the probable presence of a mood disorder (symptoms) of the respective state. Maximum subscales scores are 21 for depression and anxiety, respectively. Items referring to symptoms that may have a physical cause are not included in the scale. The HADS was found to perform well in assessing the symptom severity and caseness of anxiety disorders and depression in both somatic, psychiatric, and primary care patients, and in the general population [Bjelland et al., 2002], and it has been used previously with trans individuals [Gomez-Gil et al., 2012; Hepp et al., 2005].

The *Rosenberg Self-Esteem Scale* (RSE) [Rosenberg M, 1965] is a self-report measure of global self-esteem. Items are rated on a 4-point rating scale ranging from 0 (“Strongly disagree”) to 3 (“Strongly agree”). Its total score is calculated by summing the item scores with higher scores indicating higher self-esteem. The RSE has been empirically validated and administered previously to trans individuals [Vocks et al., 2009].

Self-cutting and its characteristics were assessed by means of the *Self-Injury Questionnaire* (SIQ) [Claes and Vandereycken, 2007]. Participants were asked whether they had ever deliberately cut themselves (yes/no) and if they had, how long ago they last did this (in the last week, month, several months ago, more than a year ago, or never). If they injured themselves during the last week or month, they were also asked to indicate which body parts were injured; how many days/month and times/day the cutting occurred; and how often and how much pain they felt during the cutting. This questionnaire has also been used in the trans population [Claes et al., 2015].

The *Experiences of Transphobia Scale* [Lombardi et al., 2001] assesses experiences of discrimination or victimization on the basis of gender identity or gender presentation. The questionnaire was based on the Transgender Violence Study and measured people's lifetime experiences of violence and harassment and experiences of any form of economic discrimination as a result of being trans (eg, verbal abuse, physical abuse, fired from a job, problems getting a job, and problems getting health or medical services due to gender identity or presentation). All five items are to be rated on a four-point Likert scale ranging from 0 ("never") to 3 ("several times").

The *Multidimensional Scale of Perceived Social Support* (MSPSS) [Zimet et al., 1990] is a 12-item, self-report scale designed to tap social support from family, friends, and significant others. Items are rated on a 7-point Likert scale ranging from 1 ("very strongly agree") to 7 ("very strongly disagree"). The instrument includes 3 subscales to address these three types of support (family, friends, significant others). The mean total and subscale scores range from 1 to 7, with a higher score indicating greater perceived social support. This scale has recently been used in trans populations [Davey et al., 2014].

The *Inventory of Interpersonal Problems* (IIP-32) [Barkham et al., 1996] measures interpersonal difficulties. It consists of 32 items to be rated on a 5-point Likert scale ranging from 0 ("Not at all") to 4 ("Extremely"). There are 8 subscales of interpersonal problems: *Hard to be Assertive, Hard to be Sociable, Hard to be Supportive, Hard to be Involved, Too Dependent, Too Caring, Too Aggressive,* and *Too Open.* A total mean score provides a global measure of interpersonal distress. Higher subscale scores indicate greater interpersonal difficulties. The IIP-32 is a shortened version of the original IIP, yet the psychometric properties are retained; a confirmatory factor analysis demonstrated high reliability with alpha coefficients of 0.70 to 0.88 [Barkham et al., 1996]. The IIP-32 has been used successfully in both nonclinical [Berry et al., 2006] and clinical samples [Davey et al., 2015].

Data Analysis

All quantitative data analyses were performed by means of SPSS 22 [IBM Corporation, 2013]. The Kolmogorov-Smirnov Test was used to assess whether the variables were normally distributed. Given that only 6 variables were normally distributed (age of first referral, HADS-anxiety, Rosenberg Self-Esteem, MSPSS-Family, IIP-32 Nurturance and Total), non-parametric tests were applied. For the first aim, descriptive statistics were applied. A quantitative analysis was performed for the second and third aim. The overall population will be divided into 2 groups: individuals on CHT prior to attending the gender identity clinic service and not on CHT. Both groups will be compared using the χ^2 test statistic (for nominal variables), the Mann-Whitney *U* test (for [non-]normal continuous variables, aim 2) and MANCOVAs (for normal distributed continuous variables, aim 3). The level of
significance used was $P < .05$.

RESULTS

Sociodemographic and Clinical Characteristics

During the recruitment period of 30 months, 689 individuals were referred to the clinic, of whom 77 (11.2%) were aged 50 years and older. Three people did not attend their appointment. Hence, the total sample consisted of 71 (96.2%) trans females and 3 (3.8%) trans males. Table 1 describes the sociodemographic and clinical characteristics of the total sample.

Table 1. Sociodemographic and Clinical Characteristics of the Total sample of Trans Females and Trans Males, Over 50 years (N=74)

	Trans Femals (n=71)		Trans Males (n=3)		Total (n=74)	
	n	(%)	n	(%)	n	(%)
Ethnic origin						
White	70	(98.6)	3	(100)	73	(98.6)
Other	1	(1.4)	0	(0)	1	(1.4)
Employment status						
Employed	24	(33.8)	1	(33.3)	25	(33.8)
Retired	14	(19.7)	0	(0)	14	(18.9)
Disabled	7	(9.9)	1	(33.3)	8	(10.8)
Unemployed	6	(8.5)	1	(33.3)	7	(9.5)
Volunteer	1	(1.4)	0	(0)	1	(1.4)
Housewife	1	(1.4)	0	(0)	1	(1.4)

Civil Status						
Single	11	(15.5)	1	(33.3)	12	(16.2)
Married	18	(25.4)	1	(33.3)	19	(25.7)
Civil partner	1	(1.4)	1	(33.3)	2	(2.7)
Divorced	34	(47.9)	0	(0)	34	(45.9)
Widowed	5	(7)	0	(0)	5	(6.8)
In a relationship	1	(1.4)	0	(0)	1	(1.4)
Children						
No	26	(36.6)	1	(33.3)	27	(36.5)
Yes	45	(63.4)	2	(66.7)	47	(63.5)
Medical History						
Medical, No	6	(8.5)	1	(33.3)	7	(9.5)
Medical, Yes	65	(91.5)	2	(66.7)	67	(90.5)
Psychiatric history						
Psychiatric, No	32	(45.1)	1	(33.3)	33	(44.6)
Psychiatric, Yes	39	(54.9)	2	(66.7)	41	(55.4)

Self-harm						
No	68	(95.8)	3	(100)	71	(95.9)
Yes	3	(4.2)	0	(0)	3	(4.1)

The sex ratio of older trans females compared with trans males was 23.7:1.

The mean age at the time of the assessment of the participants was 58.9 years (SD = 6.5). In view of the small number of older trans males attending the clinical service, consequent analysis was only performed for the 71 trans females.

Out of the 71 trans females, 33 (46.5%) were not taking CHT prior to their first clinic appointment and 38 (53.5%) were. The mean age of the trans female group at the time of the assessment and first contact with gender services was 59.32 years (SD = 6.67). The mean age of coming out was 47.39 years (SD = 13.80) and the mean age of social gender role transition was 56.02 years (SD = 9.65). Two people had not come out as trans and 21 people had not transitioned prior to their first appointment. Coming out concerns the process of becoming open about your experienced gender with yourself, other people close to you and/or publicly. Transition refers to a period of time when individuals change from the gender role associated with their sex assigned at birth to a different gender role. For many people, this involves learning how to live socially in another gender role; for others this means finding a gender role and expression most comfortable for them. Transition may or may not include feminization or masculinization of the body through cross-sex hormones or other medical procedures. The nature and duration of transition are variable and individualized [Coleman et al., 2012]. Social gender role transition is the social portion of a transition, in which a trans person makes others aware of their gender identity. Some parts of social transition can include telling people about one's gender identity, whether or not they are aware of assigned gender at birth and/or trans status; changing name used within social interactions; asking others to use different pronouns, titles and other gendered language; and changing gender expression.

Table 2 summaries the differences in rates of individuals taking up CHT prior to referral. Individuals who presented to the service on CHT were statistically significantly younger at the time of the assessment. This group also came out and transitioned significantly earlier than those trans females not on treatment (Table 2).

Table 2. Means (with standard deviations) of the Age, Age at Assessment, Referral, Coming Out and Transition of Trans Females Over 50 Years With and Without Cross-Sex Hormone Treatment (CHT)

	Not on CHT		On CHT		Total		Mann-Whitney U
	M	(SD)	M	(SD)	M	(SD)	
Age at assessment (n = 71)	60.82	(7.28)	58.03	(5.87)	59.32	(6.67)	492
Age of first referral (n=71)	60.45	(7.34)	56.79	(6.59)	58.49	(7.14)	455.5*
Age of coming out (n=69)	51.55	(14.04)	43.58	(12.61)	47.39	(13.80)	373.5†
Age of transition (n=49)	59.35	(10.65)	53.72	(8.32)	56.02	(9.65)	189.5*

* $P < .05$, $^{\dagger}P < .01$

The vast majority of the trans females in the present study were white, employed or retired; divorced, single or widowed, and had children, irrespective of the use of CHT prior to their first appointment at the gender clinic service. Additionally, the majority of trans females report a medical history, with just over half reporting previous mental health problems, with no significant differences between trans females who use and do not use CHT. The levels of self-harm or nonsuicidal self-injury (NSSI) were small, with 16.9% of the trans females reporting a lifetime NSSI. The main sociodemographic and clinical variables of the trans female sample with and without cross-sex hormones treatment are displayed in Table 3.

Table 3. Sociodemographic and Clinical Characteristics of Trans Females Over 50 Years, With and Without Cross-Sex Hormone Treatment (CHT) (n=71)

	Not on CHT		On CHT		Total		X^2
	n	(%)	n	(%)	n	(%)	
Ethnic origin							
White	33	(100)	37	(97.4)	70	(98.6)	.88
Other	0	(0)	1	(2.6)	1	(1.4)	
Employment status							
Employed							
Retired	8	(33.3)	16	(55.2)	24	(45.3)	9.37
Disabled	9	(37.5)	5	(17.2)	14	(26.4)	
Unemployed	5	(20.8)	2	(6.9)	7	(13.2)	
Volunteer	1	(4.2)	5	(17.2)	6	(11.3)	
Housewife	0	(0.0)	1	(3.4)	1	(1.9)	
	1	(4.2)	0	(0)	1	(1.9)	

Civil Status							
Single	7	(21.9)	4	(10.5)	11	(15.7)	8.80
Married	12	(37.5)	6	(15.8)	18	(25.7)	
Civil Partner	0	(0)	1	(2.6)	1	(1.4)	
Divorced	11	(34.4)	23	(60.5)	34	(48.6)	
Widowed	2	(6.3)	3	(7.9)	5	(7.1)	
In a relation	0	(0)	1	(2.6)	1	(1.4)	
Children							
No	12	(36.4)	14	(36.8)	26	(36.6)	0.002
Yes	21	(63.6)	24	(63.2)	45	(63.4)	
Medical history							
Medical, No	2	(6.1)	4	(10.5)	6	(8.5)	.46
Medical, Yes	31	(93.9)	34	(89.5)	65	(91.5)	
Psychiatric history							
Psychiatric, No							
Psychiatric, Yes	15	(45.5)	17	(44.7)	32	(45.1)	0.004
	18	(54.5)	21	(55.3)	39	(54.9)	

Self-harm							
No	27	(81.8)	32	(84.2)	59	(83.1)	0.07
Yes	6	(18.2)	6	(15.8)	12	(16.9)	

Of the 38 trans females on CHT, 21 (55%) had obtained these via the Internet. The CHT used was estrogen, either in tablet form or as patches. Eleven out of 21 (52%) trans females also used at least 1 additional drug which blocked testosterone, including cyproterone acetate, spironolactone and finasteride. Thirteen people (34%) had obtained CHT via a private physician; and 4 people (11%) received their hormone treatment from physicians working in the NHS (3 via their primary care physician and 1 via a local endocrinologist).

Cross-sex Hormone Treatment vs No Treatment

When analyzing the 2 groups of trans females, the study found significant differences between trans females with and without CHT on the HADS scale scores. Trans females on CHT were significantly less anxious (HADS-A) compared to trans females not on CHT. Interestingly, no significant difference in the level of HADS-D between the 2 groups were found. Additionally, trans females on CHT report a significantly higher level of self-esteem compared to trans females not on CHT.

The study found no significant overall differences between trans females with and without CHT on the different MSPSS scale scores.

Regarding interpersonal problems, trans females on CHT were found to present with significantly less problems with socialization and in general interpersonal functioning than trans females who do not use CHT. Finally, with respect to transphobic experiences, no significant differences were found between trans females with and without cross-sex hormone use (See Table 4).

Table 4. Means (with standard deviations) of the MSPSS, IPP-32, and Experiences of Transphobia Scale for Trans Females Over 50 years With and Without Cross-Sex Hormone Treatment (CHT)

	Not on treatment		Taking cross-sex hormones		Total		Mann-Withney U
	M	(SD)	M	(SD)	M	(SD)	
HADS (n=68)							
Anxiety	7.84	(3.90)	5.03	(3.44)	6.30	(3.89)	341†
Depression	6.68	(4.85)	4.62	(4.03)	5.56	(4.51)	432
RSE (n=69)							
Total	19.59	(6.34)	23.05	(5.32)	21.45	(6.03)	420.5*
MSPSS (n=68)							
Significant others	19.57	(8.89)	20.32	(7.69)	19.99	(8.19)	600
Family	15.53	(8.74)	16.24	(6.87)	15.93	(7.70)	553
Friends	16.10	(8.25)	19.87	(5.70)	18.21	(7.14)	464.5
Total	51.20	(21.69)	56.42	(14.09)	54.12	(17.89)	516

IIP-32: Problems							
Competition	1.03	(1.13)	0.81	(1.10)	0.92	(1.11)	516
Socialization	-0.91	(1.09)	-1.46	(1.16)	-1.20	(1.15)	375*
Nurturance	-0.42	(1.22)	-0.59	(0.88)	-0.51	(1.05)	532
Independence	0.55	(1.02)	0.42	(0.96)	0.48	(0.98)	586.5
Total	1.31	(0.58)	0.94	(0.59)	1.11	(0.61)	335.5†
Transphobia (n=70)							
Total	1.81	(2.08)	2.05	(1.79)	1.94	(1.91)	528

* $P < .05$, † $P < .01$

HADS= Hospital Anxiety and Depression Scale; RSE: Rosenberg Self-Esteem Scale; IIP-32: Inventory of Interpersonal Problems; MSPSS: Multidimensional Scale of Perceived Social Support

A multi-variant analysis (MANCOVA) was performed to determine whether there were any independent effects (Table 5). As patients were found to differ with respect to IPP-32 socialization based on whether or not they had taken CHT, we controlled for both variables while comparing patients with and without CHT on the HADS scales and the Rosenberg Self-Esteem scale. Overall, we did not find significant differences between trans females with and without CHT on the HADS scale scores while controlling for socialization problems (Wilks' $\lambda = 0.91$, $F[2,61] = 2.97$, *ns*). On the univariate level, the difference in the HADS-A between the 2 groups remained and trans females on CHT were found to be significantly less anxious (HADS-A) compared to trans females not on CHT. Additionally, anxiety/depression was significantly positive related to socialization problems ($P<.05$).

Trans females with and without CHT did not differ on self-esteem while controlling for socialization problems. Additionally, higher self-esteem was negatively related to problems with socialization ($P<.01$).

Table 5. Means (with standard deviations) of the HADS and the Rosenberg Self-esteem Scale Controlled for IPP-32 Socialization for Trans Females Over the Age of 50 Years With and Without Cross-Sex Hormone Treatment (CHT)

	Not on CHT		On CHT		Total		*F*
	M	(SD)	M	(SD)	M	(SD)	
HADS (n=68)							
Anxiety	7.80	(3.96)	5.14	(3.42)	6.35	(3.88)	5.82*
Depression	6.83	(4.86)	4.75	(4.02)	5.70	(4.51)	1.08
RSE (n=69)							
Total	19.10	(6.34)	22.86	(5. 27)	21.18	(6.02)	3.33

* $P < .05$

HADS: Hospital Anxiety and Depression Scale; RSE: Rosenberg Self-Esteem Scale

DISCUSSION

There has not been any systematic information investigating sociodemographic and clinical characteristics of older trans people. There is no systematic collection of such data in this group other than case reports [Doctor, 1985; Seifert and Windgassen, 1995], case series [Lothstein, 1979; Ettner and Wylie, 2015] and population samples obtained via the Internet [Witten, 2015] or postal questionnaires [Fredriksen-Goldsen et al., 2013; Fredriksen-Goldsen et al., 2015]. Similarly, there has been no research investigating the role of CHT in older trans people. This is the first study to exclusively focus on trans people aged 50 years and beyond who seek treatment at a gender identity clinic service. This is an important area as older trans people remain invisible in research studies and often experience double discrimination, being trans as well as being older. Moreover, they are at a higher risk of developing adverse effects from CHT [Asscheman et al., 2011; Wierckx et al., 2012], as they are more prone to comorbidities as well as using CHT without medical advice and supervision.

The study found that the overwhelming majority of older people presenting at gender identity clinic services over the age of 50 years old are trans females, with a sex ratio of 23.7:1 over trans males. To our knowledge, this has not been documented formally in the empirical literature and is distinctly different from the sex ratio of trans adolescents and trans adults, which points towards near parity [Kreukels et al., 2012; Simonsen et al., 2015; Aitken et al., 2015; Dhejne et al., 2014].

Whether trans people who transition later in life constitute a different group compared to their younger counterparts has been vociferously debated [Lev, 2004; Namaste, 2000]. Trans people who transition later in life may have different psychosocial characteristics, but the exact etiology remains unclear. It remains to be seen how clinically relevant further classification in this context is; ethically there is general agreement in medicine that like cases should be treated alike [Bouman et al., 2014]. The mainstay physical treatment options remain the same and include CHT and gender-related surgeries [Coleman et al., 2012; Wylie et al., 2014]. There is a higher risk associated with these treatments for older people, which should be discussed with patients on an informed consent model basis [Asscheman et al., 2011; Wierckx et al., 2012; Bouman et al., 2014; Buncamper et al., 2015]. Cross-sex hormone use was present in 54% of gender clinic referrals, of whom more than 50% sourced the hormones via the Internet. It is concerning that 28% of older trans people who presented at the clinical service had obtained hormone treatment via the Internet without medical advice. This is significantly higher than previously reported [Mepham et al., 2014] and it may be a reflection of the significant barriers to treatment for older trans people. Ageism, discrimination in employment, and lack of social and family support plus lack of gender identity clinic services, long waiting lists, and lack of funding [Davey et al., 2014; McNeil et al., 2012; Orel, 2014] may why older trans people obtain treatment without medical assistance or support [McNeil et al., 2012; Mepham et al., 2014]. Moreover, it could be argued that overly prescriptive pathways to access hormone treatment in Standards of Care [Coleman et al., 2012; Wylie et al., 2014] further increase barriers to treatment.

The finding that trans females who presented to the clinical service on CHT were significantly younger than their counterparts, who were not on CHT may be a reflection of the higher accessibility to the Internet associated with a younger age. Older people may be less skilled in using computer technology, which makes obtaining hormones via the Internet more difficult. An alternative explanation may be that older people are less willing to initiate hormone treatment that is not prescribed and monitored by a physician. The study also showed that those on CHT came out and transitioned significantly earlier than those trans females not on treatment. As we do not know how long people were taking CHT the direction of the association between starting hormone treatment, coming out as trans, and time of transition remains unknown. Interestingly, independent of hormone treatment the time between coming out as trans and age of transition remains around a decade. This is a considerable amount of time and may well be related to family and work responsibilities, although future research may want to investigate the specific underlying reasons for this.

The life-time prevalence of nonsuicidal self-injury (NSSI, i.e, cutting) was 16.9% in our sample of older trans females, which is much lower than the prevalence of NSSI in younger trans females (26.2%) [Claes et al., 2015], but significantly higher than the life-time prevalence of NSSI in an adult community sample (5.9%) [Klonsky, 2011]. As most injurers report that NSSI functions to alleviate negative emotions, further research should focus on underlying etiology and preventative measures.

Older trans females who use cross-sex hormones were found to be significantly less anxious and reported a significantly higher self-esteem compared to older trans females who do not use hormones. The association disappeared for self-esteem when controlled for problems with socialization. As older trans females who use cross-sex hormones experienced fewer problems with socialization than older trans females who did not use hormones, controlling for this variable known to predict psychopathology was important. This is one of the few studies that have controlled for predictive variables when studying the role of treatment in trans people. The study shows that when controlling interpersonal difficulties the levels of anxiety in trans females on CHT is consistent with other research of younger trans people who use cross-sex hormones and highlights the psychological and social benefits that may be associated with CHT for trans people [Gomez-Gil et al., 2012; Gorin-Lazard et al., 2012; Keo-Meier et al., 2015]. However, due to the cross-sectional nature of this study, cause and effect could not be concluded. It must also be acknowledged that these trans females as autonomous agents have sought access to hormone treatment without assistance or support from gender identity clinic services. Given the benefits patients may derive from CHT and bearing in mind the risks associated with CHT that is not adequately monitored, particularly in older people, a re-evaluation of the function and purpose of gender identity clinic services is timely.

A limitation of the study is the cross-sectional nature of the data. Future research could investigate underlying motives as to why people obtain and use CHT without medical advice, what the associated risks are, if any, and why people transition later in life. From the current data, it is not possible to determine whether the psychological benefits associated with the use of hormone treatment predate or are a consequence of disclosure of experienced gender and/or social gender role transition. It may also be that those with a better self-esteem, less psychopathology and fewer problems with socialization feel more confident to commence treatment without medical advice. They may use the support and advice of their friends who also may be taking CHT. Longitudinal data would provide the ideal avenue to explore this. The study is also limited by selecting a specific population of treatment seeking individuals and doing so in a country in which the waiting list for a first appointment at a gender identity clinic service is long. Hence, the results may not be generalizable to other older trans females who do not access clinical services or to other countries with different healthcare systems. The research makes use of self-reported questionnaires, and although most are adequately validated and have been used in trans populations, future research could use structured clinical interviews to differentiate the clinical group from those with and without anxiety. A final note on the generalizability of these findings is that there are particularities with regards to medical treatment and legislation for trans person people in the UK. For example, some aspects of gender reassignment treatment (e.g. CHT and/or genital reconstructive surgeries) are available through the NHS free at the point of access, and the Gender

Recognition Act 2004 provides legal recognition of a trans individual's experienced gender. In addition, the Sex Discrimination (Gender Reassignment) Regulations Act 1999, and its amendment in 2008, deemed it unlawful to discriminate on the basis of gender reassignment within employment and vocational training, as well as within the provision of goods, facilities, and services. Consequently, the experience of living as trans in the United Kingdom may be different from living as trans in other countries. A cross-cultural validation of the findings would be expedient because differences in legislation and health service provision are likely to affect the experience of being trans [Davey et al., 2015].

CONCLUSION

The majority of older people presenting at gender identity clinic services over the age of 50 years old are trans females. After coming out as trans older people take on average about a decade to fully transition, which may be related to employment or family responsibilities. More than a quarter of this older trans population had obtained hormone treatment via the Internet without medical advice. Older trans females who use cross-sex hormones were found to be significantly less anxious compared to older trans females who do not use hormones, even when controlled for interpersonal difficulties. Older female trans people clearly derive benefits from CHT. Clinicians need to provide education regarding CHT and advice regular monitoring to reduce risks associated with CHT.

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6.5. Study 5: Transgender and Anxiety: A comparative study between transgender people and the general population

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Abstract

Background: Anxiety disorders pose serious public health problems. The data available on anxiety disorders in the transgender population is limited by the small numbers, the lack of a matched controlled population and the selection of a non- homogenous group of transgender people.

Aims: The aims of the study were (1) To determine anxiety symptomatology (based on the HADS) in a non-treated transgender population and to compare them to a large general population sample matched by age and gender; (2) To investigate the predictive role of specific variables such as experienced gender, self-esteem, victimization, social support, interpersonal functioning and cross-sex hormone use regarding levels of anxiety symptomatology among transgender people; (3) To investigate differences in anxiety symptomatology between transgender people on cross-sex hormone treatment and those who are not.

Methods: A total of 913 individuals, who self-identified as transgender attending a transgender health service during a three-year period agreed participation. For the first aim of the study 592 transgender people not on treatment were matched by age and gender with 3816 people from the general population. For the second and third aim the whole transgender population was included.

Measurements: Socio-demographic variables and measures of depression and anxiety (HADS), self-esteem (RSE), victimisation (ETS), social support (MSPSS), and interpersonal functioning (IIP-32).

***Results**:* Compared with the general population transgender people had a nearly 3-fold increased risk of probable anxiety disorder (all $p < .05$). Low self-esteem and interpersonal functioning were found to be significant predictors of anxiety symptoms. Trans women on treatment with cross-sex hormones were found to have lower levels of anxiety disorder symptomatology.

***Conclusion*s**: Transgender people (particularly trans males) have higher levels of anxiety symptoms suggestive of possible anxiety disorders, when compared to the general population. The findings that self-esteem, interpersonal functioning and hormone treatment is associated with lower levels of anxiety symptoms indicate the need for clinical interventions targeting self-esteem and interpersonal difficulties as well as the importance of quick access to transgender health services.

Key words: Transgender; Gender Dysphoria; anxiety; mental health; HADS; self-esteem; interpersonal functioning; cross-sex hormone treatment

Introduction

Transgender people are a diverse population of individuals who do not present and/or identify as the gender they were assigned to at birth, either some or all of the time (Richards and Barker, 2013). Transgender identities include women and men, who feminize or masculinize their bodies with cross-sex hormone treatment (CHT) and/or gender confirming surgery (GCS), and other gender-variant individuals, who may identify and/or present in a way which is outside the gender dichotomy of man/woman (Richards et al., 2016). Transgender people have been found to face a number of difficulties and interpersonal challenges (such as disclosing their gender identity) (Bockting and Coleman, 2016). They have been found to suffer from high levels of discrimination and victimization (Bockting et al., 2013; Claes et al., 2015; Lombardi et al., 2001) as well as rejection from family and loved ones (Koken et al., 2009). Possibly as a consequence, many transgender people have low self-esteem (Erich et al., 2010) and high prevalence rates of mental health problems, particularly anxiety disorders and depression (Arcelus et al., 2016; Bockting et al., 2013; Claes et al., 2015; Davey et al., 2014, 2016; Dhejne et al., 2016; Heylens et al., 2014a,b).

Research in the transgender population pre-treatment using cross sectional data, have shown high levels of anxiety symptomatology in this population (Bockting et al., 2013; de Vries et al., 2011; Heylens et al., 2014a; Reisner et al., 2015, 2016). High levels of anxiety symptomatology are particularly prevalent in transgender people before treatment (Bergero-Miguel et al., 2016; Colizzi et al., 2013; de Vries et al., 2011; Gómez-Gil et al., 2012; Heylens et al., 2014a).

Research looking at anxiety symptoms and anxiety disorders in the transgender population have found an association with frequent experiences of discrimination in employment and housing, violence, physical and verbal abuse, societal harassment related to gender presentation, perceived need to keep one’s transgender identity a secret and lack of gender confirming treatment (Bockting et al., 2013; Clements-Nolle et al., 2006; McNeil et al., 2012). Some of these findings support the minority stress theory (Meyer, 1995; 2003). Once again, these studies are limited by the small numbers of transgender people as well as heterogeneity of the group (for instance, people at different stages of transition).

Several studies have looked at to the role of gender confirming medical treatment (cross-sex hormone treatment (CHT) and gender affirming surgery (GAS)) in anxiety symptoms among the transgender population (Bouman et al., 2016a; Colizzi et al., 2013, 2014; Davis and Colton Meier, 2014; De Vries et al., 2014; Dhejne et al., 2016; Gomez-Gil et al., 2012; Heylens et al., 2014b; Meier et al., 2011). These studies showed that gender confirming medical treatment improves mental health, including anxiety symptomatology. However, the results are not consistent (e.g., Reisner et al., 2015) and limited by a small sample size (e.g., De Vries et al., 2014; Heylens et al., 2014b) or by the lack of matched controls (e.g., Colizzi et al., 2013, 2014; Davis and Colton Meier, 2014; Gomez-Gil et al., 2012).

This study addresses the aforementioned limitations of a small sample size, a lack of homogeneity and a matched control group. The current study investigates the prevalence of possible or probable anxiety disorder in a large cohort of adult transgender people, who seek treatment at a national transgender health service; and the study compares this large cohort of adult transgender people to general population data matched by age and gender (experienced gender).

This study has several aims. Firstly, to determine the levels of anxiety symptomatology suggesting possible and probable anxiety disorder in non-treated transgender people and to compare them with a cisgender population matched by age and gender. Secondly, to investigate the predictive role for anxiety disorders (possible and probable) of specific variables known to be associated with anxiety symptoms in the cisgender and transgender population such as age, gender, self-esteem, social support, interpersonal functioning and victimisation and the use of CHT in transgender people (Bouman et al., 2016a; Claes et al., 2015; Colizzi et al., 2014; Davey et al., 2014, 2015; Gomez-Gil et al., 2012; Kessler et al., 2005a; Kessler et al., 2005b; McLean et al., 2011; Meier et al., 2011). Finally, to investigate differences in anxiety scores between transgender people on cross-sex hormone treatment (CHT) with those not on cross-sex hormone treatment (non-CHT). For the last two aims the whole population of transgender people (on CHT and not on CHT) will be selected.

Based on the literature regarding anxiety and transgender people, it was hypothesized that levels of anxiety will be higher in the transgender population compared to the general population, and associated with psychopathology, decreased self-esteem and social support, discrimination, lower levels of interpersonal functioning and lack of CHT treatment. There is no clear hypothesis regarding the relationship between gender and anxiety symptoms. Studies in the general population suggest that cisgender women present with higher levels of anxiety symptoms than cisgender men, which may suggest that trans women present with higher anxiety symptoms too. There is, however, also the possibility that genetic factors play a role in the aetiology of anxiety disorders, and consequently a predisposition to develop anxiety disorders may relate to one's assigned gender at birth.

Methods

Participants and Procedures

Transgender participants

The sample consisted of all individuals who self-identify as transgender and attended for an assessment to a national transgender health service in Nottingham, UK during a 3-year period, between November 2012 and October 2015. For the first aim of the study only individuals not on treatment with cross-sex hormones (non-CHT) before assessment will be selected in order to have a homogeneous group.

Following assessment, the transgender person is considered for entry into the treatment programme. Treatment, including CHT and GAS is free at the point of access in the National Health Service (NHS) in the United Kingdom for all citizens. Patients will usually start CHT, following informed consent, if there are no physical contraindications. Chest reconstructive surgery is generally available to trans men after being on testosterone treatment for a minimum of 6 months. Genital reconstructive surgeries are generally available to transgender people after being in the treatment programme for a minimum of 12 months. We acknowledge that not all transgender people wish to take cross-sex hormones or undergo gender confirming surgeries; a growing number of transgender people express a wish for partial treatment (Beek et al., 2015). Once transgender people have undergone their desired treatment, follow-up care can be organised at the service, if they wish (Wylie et al., 2014). Prior to the clinical assessment every patient was invited to participate in the study, and if agreed to complete a battery of questionnaires. The study received ethical approval from the NHS Ethics committee and from the Research and Development Department from Nottinghamshire Healthcare NHS Foundation Trust in line with Health Research Authority guidance (HRA, 2013).

Control group

A total of 3816 adults from the general population with an age range of 16-92 who participated in another study (Crawford et al., 2009) was used as controls and matched by age and gender. These samples were recruited between 2006 and 2009. In order to increase the normative data, a broad representation of the general adult UK population was selected, in terms of the age, education, and gender (although, in most cases, females were over sampled). The recruitment process included a variety of sources such as large and small businesses, public service organizations, community centres, and recreational groups. The majority of participants were recruited from urban/ suburban locations, although rural/semi-rural people were also represented. As per the transgender group, participants were invited to complete the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) and place them in a sealed envelope. The questionnaires were filled out anonymously. The combined refusal/non-return rates ranged from approximately 17% to 21%. Ethical approval was obtained from the Psychology Ethics Committee of the University of Aberdeen, Aberdeen, United Kingdom.

Main Outcome Measures

The **Hospital Anxiety and Depression Scale** (HADS) (Zigmond & Snaith, 1983) is a 14-item self-report screening scale that was originally developed to indicate the possible presence of anxiety and depression states in the setting of a medical non-psychiatric outpatient clinic. HADS consists of two subscales, HAD-Anxiety (HAD-A) and HAD-Depression (HAD-D). For this study only the subscale of anxiety will be used. This subscale has seven items, rated on a 4-point Likert scale (ranging from, as much as I always do (0); not quite so much (1); definitely not so much (2); to not at all (3)), indicating symptoms of anxiety during the preceding week. A score of 0-7 on either scale is regarding as being in the normal range (no symptoms), a score of 8-10 is suggestive of the presence of an anxiety disorder (possible symptoms), and a score of 11 or higher indicates the probable presence of an anxiety disorder (symptoms) of the respective state. Maximum subscales scores are 21 for anxiety. The HADS was found to perform well in assessing the symptom severity and caseness of anxiety disorders in both somatic, psychiatric and primary care patients and in the general population (Bjelland et al., 2002) and it has been previously used with transgender individuals (Bouman et al., 2016a; Gomez-Gil et al., 2012). A number of researchers have explored HADS data to establish the cut-off points for caseness of anxiety. Bjelland et al. (2002) through a systematic review of a large number of studies identified a cut-off point of 8/21 for anxiety. For anxiety (HADS-A) this gave a specificity of 0.78 and a sensitivity of 0.9. In this study, the Cronbach's alpha was 0.68 for the anxiety scale.

The **Rosenberg Self-Esteem Scale** (RSE) (Rosenberg, 1965) is a self-report measure of global self-esteem. Items are rated on a 4-point rating scale ranging from 0 ('Strongly disagree') to 3 ('Strongly agree'). Its total score is calculated by summing the item scores with higher scores indicating higher self-esteem. The RSE has been empirically validated and administered previously to transgender individuals (Arcelus et al., 2016; Vocks et al., 2009). In this study the Cronbach's alpha was 0.91.

The **Experiences of Transgender Phobia Scale** (Lombardi et al., 2001) assesses experiences of discrimination or victimization on the basis of gender identity or gender presentation. The questionnaire was based on the Transgender Violence Study and measured people's lifetime experiences of violence and harassment and experiences of any form of economic discrimination as a result of being transgender (e.g., verbal abuse, physical abuse, fired from a job, problems getting a job, and problems getting health or medical services due to gender identity or presentation). All five items are to be rated on a four-point Likert scale ranging from 0 ('never') to 3 ('several times'). This scale has been previously used with transgender individuals (Arcelus et al., 2016; Bouman et al., 2016a,b; Claes et al., 2015). In this study the Cronbach's alpha was 0.59.

The **Multidimensional Scale of Perceived Social Support** (MSPSS) (Zimet et al., 1990) is a 12-item, self-report scale designed to tap social support from family, friends, and significant others. Items are rated on a 7-point Likert scale ranging from 1 ('very strongly agree') to 7 ('very strongly disagree'). The instrument includes three subscales to address these three types of support (family, friends, significant others). The mean total and subscale scores range from 1 to 7, and a higher score indicates greater perceived social support. This scale has recently been used in transgender populations (Boza et al., 2014; Davey et al., 2014, 2016). In this study the Cronbach's alpha was 0.89 for the total scale.

The **Inventory of Interpersonal Problems** (IIP-32) (Barkham et al., 1996) measures interpersonal difficulties. It consists of 32 items to be rated on a 5-point Likert scale ranging from 0 ('Not at all') to 4 ('Extremely'). There are eight subscales of interpersonal problems: *Hard to be Assertive, Hard to be Sociable, Hard to be Supportive, Hard to be Involved,* *Too Dependent, Too Caring, Too Aggressive, and Too Open*. A total mean score provides a global measure of interpersonal distress. Higher subscale scores indicate greater interpersonal difficulties. The IIP-32 is a shortened version of the original IIP, yet the psychometric properties are retained; a confirmatory factor analysis demonstrated high reliability with alpha coefficients of 0.70 to 0.88 (Barkham et al., 1996). The IIP-32 has been used successfully in both non-clinical (Berry et al., 2006) and clinical samples (Bouman et al., 2016b; Davey et al., 2015). In this study the Cronbach's alpha was 0.87 for the total scale.

Data Analysis

All quantitative data analyses were performed by means of SPSS 22 (IBM, 2013). First descriptive statistics were applied. For the first aim, only transgender people will be included in order to have a homogenous group. As per the authors advice based on the HADS three categories will be developed: 1) people with no anxiety disorder, 2) people with symptoms suggesting of a possible anxiety disorder and, 3) people with symptoms suggesting a probable anxiety disorder. We used the Chi-Square Test Statistic to calculate the association between the three levels of anxiety symptomatology and the participant status (transgender and controls) for the total group and for males/females separately. For the second aim, the prediction of the presence/absence of an anxiety disorder based on self-esteem, social support, interpersonal functioning and victimization and the use of CHT in transgender people controlled for gender and age, we performed a hierarchical regression analysis, with the presence/absence of the anxiety disorder as a dependent variable (dummy), age and gender (step 1) as control variables and the other variables (step 2) as predictors. For the third aim, the association between the presence/absence of an anxiety disorder and the use/not use of CHT, we calculated the Chi Square Test Statistic for the total group, and males/females separately. The level of significance used was $p < 0.05$.

Results

Socio-demographic characteristics of the whole sample regarding

During the recruitment period of 3 years 913 individuals who fulfilled the inclusion criteria agreed to participate. Twenty-five individuals (2.6%) did not agree participation, which gives a response rate of 97.4%. The age range of the participants was 15-79 years with a mean age of 30.4 years (SD= 13.9); 582 (63.7%) patients identified themselves as trans females (assigned male at birth) and 331 (36.3%) as trans males (assigned female at birth). Of the total sample of 913 transgender people 640 (70,1%) were not on cross-sex hormone treatment, 259 (28.4%) were on CHT, whilst for 14 patients (1.5%) this information was not available and they were removed for further analyses.

Comparative analyses between transgender people not on CHT and controls.

For the first aim of the study only people not on CHT were selected (n=640). Of the 640 patients in the non-CHT group the age range was 16-79 years with a mean age of 28.6 years (SD= 12.8); 393 (61.4%) patients identified as trans females (assigned male at birth) and 247 (38.6%) were trans males (assigned female at birth). This group was matched by age and experienced gender with the control group. Of the 640 patients in the non-CHT group 48 (7.5%) could not be matched due to insufficient numbers for that age in the control data. This group consisted of 19 trans females and 28 trans males aged 17 and 18 with an average age of 17.3 years (SD= 0.48). The remaining sample of 592 non-CHT patients were block matched with the control population data base. This meant that for the first aim, a total of 1184 participants were selected, 592 in each group.

Out of the 592 transgender and cisgender participants, 218 (36.8%) were trans and cis females and 374 (63.2%) were trans and cis males respectively. As Table 1 shows the control group were significantly more prevalent in the category of 'No Anxiety Disorder' compared to the transgender group, whereas the transgender people were significantly more prevalent in the categories 'Possible and Probable Anxiety Disorder' compared to the control group. This difference was statistically significant [$X^2_{(2)} = 148.997$, $p < .001$]. When comparing trans with cis men [$X^2_{(2)} = 128{,}521$, $p < .001$] and trans with cis women [$X^2_{(2)} = 21{,}443$, $p < .001$], the difference was still statistically significant.

Table 1: Number of transgender (TG) and controls with no anxiety disorders, and anxiety disorders symptoms (possible and probable anxiety disorder) (n=1184)

		Both Genders (n=1184)				Trans males (n=436)				Trans females (n=748)			
		TG (n=592)		Controls (n=592)		TG (n=218)		Controls (n=218)		TG (n=374)		Controls (n=374)	
No Anxiety disorder n(%)		185 (31.2)*		388 (65.5)*		72 (33.0)*		120 (55.0)*		113 (30.2)*		268 (71.6)*	
Anxiety disorders n(%)	Possible n(%)	407 (68.8)*	194 (32.8)	204 (34.5)*	126 (21.3)	146 (67.0)*	67 (30.7)	98 (45.0)*	58 (26.6)	261 (69.8)*	126 (33.7)	106 (28.4)*	68 (18.2)
	Probable n(%)		213 (36.0)		78 (13.2)		78 (36.3)		40 (18.4)		133 (36.1)		38 (10.2)

*p<.05

Predictors of anxiety disorders (probable and possible) among the whole transgender population

In order to analyze the predictors of anxiety in the transgender population, the whole group of 913 transgender people (excluding the 14 people without information regarding CHT), were included (giving a total of 899 individuals). Those in the category of probable and possible anxiety symptoms were grouped together into one category (anxiety disorder). A linear hierarchical regression analysis with the presence or absence of anxiety disorder as dependent variable, age and gender as control variables, and self-esteem, social support, interpersonal functioning and victimization and presence and absence of CHT as independent variables was performed. The results showed that low self-esteem and interpersonal problems were the only significant predictors for a transgender person attending transgender health services to suffer from a possible and probable anxiety disorder. Interpersonal functioning was a stronger predictor (See Table 2).

Table 2. Predictive role of age, gender, self-esteem, social support, interpersonal function and victimization in transgender people with possible and probable anxiety disorder (as one category) compared to transgender people with no anxiety disorder.

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	p
1	(Constant)	,824	,076		10,780	,000
	Age	-,005	,001	-,143	-3,830	,000
	Assigned Gender	-,028	,037	-,028	-,751	,453
2	(Constant)	,634	,107		5,911	,000
	Age	,001	,001	,028	,812	,417
	Assigned Gender	,008	,031	,008	,239	,811
	CHT pre assessment	-,001	,013	-,001	-,043	,966
	Global score MSPSS	-,002	,001	-,056	-1,754	,080
	Total RSE	-,019	,003	-,259	-6,404	,000
	Global IIP score	,256	,028	,348	9,243	,000
	Total Transphobia	,006	,006	,030	1,002	,317

a. Dependent Variable: HADS score; * $p < 0.05$

Analyses comparing transgender people on CHT with those not on CHT found a statistically significant difference between both groups with more transgender people using CHT in the category of no anxiety disorder compared to those on not on CHT [$X^2_{(1)}$ = 20,266, $p < .001$]. The latter group is more prevalent in the category anxiety disorder (see Table 3.). As the use of CHT was more prevalent among trans females and anxiety symptoms were more prevalent among trans men the same analyses were performed according to gender. The new analyses showed that for trans females being on CHT was associated with less anxiety disorder as there were more trans females not on CHT in the category of anxiety disorders when compared to trans females on CHT [$X^2_{(1)}$ = 21,802, $p < .001$]. This was not the case for trans males [$X^2_{(1)}$ = 1,379, $p < .240$].

Table 3. Differences in anxiety symptomatology based on the HADS in transgender people on cross-sex hormone treatment (CHT) and those who are not on treatment (n= 899)

	Transgender people not on CHT N(%)			Transgender people on CHT (N(%)		
	All (n=640)	Trans female (n=393)	Trans male (n=247)	All (n=259)	Trans female (n=179)	Trans male (n=80)
No Anxiety disorder (Score 0-7)	202 (31.5)*	118 (30.0)*	84 (34.0)	123 (47.5) *	90 (50.3)*	33 (41.2)
Possible or probable anxiety disorder (Score ≥ 8)	438 (68.5)*	275 (70.0)*	163 (66.0)	136 (52.5)*	89 (49.7)*	47 (58.8)

*$p < 0.05$

Discussion

Anxiety disorders are the most common mental disorders, with a reported 12-month prevalence of 18.1% and a lifetime prevalence of 28.8% (Kessler et al., 2005a; Kessler et al., 2005b). Moreover, women are significantly more likely than men to develop an anxiety disorder throughout the lifespan (McLean et al., 2011). Owing to their high prevalence, combined with an often early onset and chronic course, anxiety disorders are the second most important cause of disability worldwide within the group of mental and behavioural disorders (Whiteford et al., 2013; de Vries et al., 2016). This study found high rates of possible (32.8%) and probable (36.0%) current anxiety disorder in untreated transgender people attending a transgender health service. Compared with a cisgender matched control group from the general population, transgender people had an almost 3-fold increased risk of probable anxiety disorder. Trans males showed higher rates of possible and probable anxiety disorder (71.1%) than trans females (59.8%), which would be in keeping with the literature on gender differences in anxiety disorders, if the pattern of birth gender is followed (McLean et al., 2011). Studies looking as to why anxiety symptoms are more prevalent among individuals whose gender is assigned female at birth, suggest that differences in neurobiological make-up may account for these differences. The brain system involved in the fight-or-flight response is activated more readily in female-assigned-at-birth individuals and stays activated longer than male-assigned-at-birth individuals, partly as a result of the action of estrogen and progesterone. The neurotransmitter serotonin may also play a role in responsiveness to stress and anxiety. Some evidence suggests that the brain of individuals, whose sex is assigned female at birth does not process serotonin as quickly as their male counterparts. Recent research has also found that female-assigned-at-birth individuals are more sensitive to low levels of corticotropin-releasing factor (CRF), a hormone that organizes stress responses in mammals, making them twice as vulnerable as their male-assigned-at-birth counterparts to stress-related disorders (Bangasser et al., 2016).

This study found low self-esteem and interpersonal functioning to be predictors of anxiety disorder, which highlights the importance of psychological intervention and support in this vulnerable group. Psychological treatment aiming at improving self-esteem and interpersonal functioning may help transgender individuals at risk of developing anxiety disorder when going through the transitional process. Various psychological treatments have proven efficacious in increasing self-esteem (Morton et al., 2012; Fennel, 2006; Rigby and Waite, 2007). Similarly, interpersonal psychotherapy (IPT) has been found efficacious in reducing interpersonal problems. As IPT has been successfully used in various populations (e.g., Arcelus et al., 2011; Hara et al., 2000; Mufson et al., 2013), it could be adapted for use within the transgender population (Budge, 2013). For those transgender patients who meet a diagnosis of anxiety disorder current treatment approaches apply, including consideration of pharmacotherapy and/or psychological treatment (Baldwin et al., 2014; Iacoviello & Charney, 2015).

Further findings confirmed the benefits of cross-sex hormone treatment, particularly for transgender women on CHT, as they were significantly more prevalent in the category no anxiety disorder compared to those who do not use cross-sex hormones. That these findings do not apply to trans men is surprising, and certainly do not reflect our clinical experience. One explanation may be that the higher risk of developing anxiety disorder for people whose sex is female assigned at birth offsets the positive psychological benefits of CHT in trans men. This specific area needs further study. The findings confirm existing research (Gomez-Gil et al., 2012; Colizzi et al., 2014; De Vries et al., 2014; Heylens et al., 2014b; Bouman et al., 2016) and add further weight to the rationale of early treatment for gender dysphoria. In many countries, long waiting lists and lack of clinical services for transgender people combined with overly prescriptive pathways to access CHT in Standards of Care (Coleman et al., 2012; Wylie et al., 2014) continue to be significant barriers to treatment for transgender people. Moreover, these barriers to access treatment are likely to further increase the rate of anxiety disorders; also, they tend to lead to self-prescribing via the Internet without medical supervision (Mepham et al., 2014).

There are aspects of the study that warrant attention in relation to limitation of the results. First, the study is limited by selecting a specific population of treatment seeking individuals and doing so in a country in which the waiting list for a first appointment at a transgender health service is long. Hence, the results may not be generalizable to other transgender people who do not access clinical services or to other countries with different healthcare systems. Second, the research makes use of self-reported questionnaires, and although most are adequately validated and have been used in transgender populations, future research could use structured clinical interviews to differentiate the clinical group from those with and without anxiety disorder and other psychiatric morbidity. Furthermore, a limitation of the study is the cross-sectional nature of the data. From the current data, it is not possible to determine whether the psychological benefits associated with the use of CHT predate or are a consequence of disclosure of experienced gender and/or social gender role transition. It also may be that those with better self-esteem and less psychopathology feel more confident to commence treatment without medical advice. They may use the support and advice of their friends who also may be taking CHT. The lack of information regarding the gender identity of the control group used, makes it impossible to generalize the results to the transgender population, as some of people in control group may also be identified as transgender. This information was not asked, although, given the low prevalence the impact on the final results is likely to be negligible (Arcelus et al., 2015). Many studies in the field of transgender health have included people fulfilling a diagnosis as per the ICD or DSM (e.g., Colizzi et al., 2013; de Vries et al., 2011; Gómez-Gil et al., 2012; Heylens et al., 2014[a]) as well as relying on self-identification regarding one's gender (e.g., Bockting et al., 2013; Davis & Colton Meier, 2014; Reisner et al., 2016; Warren et al., 2016). This study has not used a diagnosis to classify people, but selected a population of people who self-identify as transgender and access transgender health services for treatment. It can be argued that the population selected in this study may be slightly different to the one fulfilling diagnostic criteria, although this is not our clinical impression, but we do want to acknowledge this difference. A final note on the generalizability of the findings is that there are particularities with regards to medical treatment and legislation for transgender person people in the UK. For example, some aspects of gender reassignment treatment (e.g. CHT and/or GCS) are available through the NHS free at the point of access, and the Gender Recognition Act 2004 provides legal recognition of a trans individual's experienced gender. In addition, the Sex Discrimination (Gender Reassignment) Regulations Act 1999, and its amendment in 2008, deemed it unlawful to discriminate on the basis of gender reassignment within employment and vocational training, as well as within the provision of goods, facilities, and services. Consequently, the experience of living as a transgender person in the United Kingdom may be different from living as a transgender person in other countries (Davey et al., 2015). In spite of the above limitations the strength of the paper is the large group of transgender and control group involved, making this one of the largest studies in this field. The study is also strengthened by the matching of groups (transgender and controls and transgender on CHT and not on CHT). The lack of matching between groups in the transgender literature has been criticized previously (Dhejne et al., 2016). Notwithstanding the aforementioned limitations, this study clearly shows that treatment-seeking transgender individuals have a high prevalence rate of possible and probable anxiety disorder compared to the general population. Having an experienced male gender, low self esteem, interpersonal problems and lack of cross-sex hormone treatment are specifically associated with an increased likelihood of co-existing anxiety disorder in transgender people, having low self esteem and interpersonal problems being the main predictors for anxiety. Mental health services should take heed of these findings to improve outcomes in this vulnerable group of individuals.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

CHAPTER 7. GENERAL DISCUSSION

7.1. *PREVALENCE OF TRANSSEXUALISM*

Over the past 5 decades, several studies have reported prevalence figures of transsexualism. The variation in reported prevalence is considerable and may be explained by factors such as methodology and diagnostic classification used and the year and country in which the studies were carried out. **Study 1** found an overall meta-analytical prevalence for transsexualism of 4.6 in 100,000 individuals; 6.8 for trans women and 2.6 for trans men, which suggests a sex ratio of trans females to trans males of 2.62:1. Time analysis found a clear increase in reported prevalence over the last 50 years.

In the context of these findings, there are a number of issues to consider. Firstly, the overall prevalence of transsexualism reported in the literature is increasing. Notwithstanding this finding, the prevalence is still very low and does not reflect recent clinical reports from Europe and North America that the number of referrals of transgender people to transgender health services is increasing significantly (Aitken et al., 2015; de Vries et al., 2015). So, why this discrepancy between the meta-analytical findings of **Study 1** and clinical reality? There are a number of factors which play a role, including diagnostic classification, population bias and the time the prevalence studies took place. Transsexualism was included in the ICD-9 in 1978 (WHO, 1978) and in the DSM-III in 1980 (APA, 1980), respectively. The diagnostic criteria for transsexualism postulate that the individual desires to live and be accepted as a member of the opposite sex, usually accompanied by the wish to make his or her body as congruent as possible with the preferred sex through surgery and hormonal treatment (WHO, 1992). The transsexual identity has been present persistently for at least two years. Transsexual people experience a gender identity that is inconsistent with, or not culturally associated with, their assigned sex, and desire to permanently transition to the gender with which they identify, usually seeking medical assistance to help them align their body with their identified sex or gender. These diagnostic criteria are specific and narrowly defined. Being transsexual is generally considered a subset of being transgender, which is an umbrella term to describe anyone whose gender identity, expression or behaviour is different from the assigned gender at birth based on the sexual characteristics. Being transgender comprises a far broader definition of not identifying with one's gender assigned at birth, and hence a far larger population. Population studies in the Netherlands and Belgium report gender incongruence (defined as stronger identification with other sex as with sex assigned at birth) in 0.6-1.1% of the population (Kuyper & Wijsen, 2014; Van Canaegem et al., 2015). Whether these people will seek treatment at a transgender health service is not known.

Recently, the name of the diagnosis to describe transsexual people changed into *Gender Dysphoria* (APA, 2013) and in the upcoming version of the International Classifications of Diseases of the World Health Organisation the proposed term for the diagnosis is *Gender Incongruence* (Drescher, Cohen-Kettenis, & Winter, 2012). In order to fulfil the diagnostic criteria of Gender Dysphoria and/or Gender Incongruence these feelings have to be present for 6 months rather than the previously stipulated 2 years.

It has also been argued that individuals with gender incongruence do not necessarily experience a complete cross-gender identity, and may not always choose cross-sex hormone treatment and/or gender affirming surgeries (e.g. Diamond & Butterworth, 2008; Lee, 2001). These individuals may or may not experience distress and they may or may not want to live as “the other gender” some of the time or all of the time (see Cohen-Kettenis & Pfäfflin, 2010, for an overview). Hence, there is now a much larger, and more diverse group of transgender people, and a substantial proportion of this group may seek treatment at transgender health services. Also, some of the more recent prevalence studies included in the meta-analysis (e.g. Dhejne et al., 2014; Vujovic et al., 2008) include a highly selected group of transsexual patients, namely only those who seek genital reconstructive surgery, whilst there is growing evidence that a growing number of transgender people express a wish for partial treatment (Beek et al., 2015). Furthermore, the vast majority of prevalence studies regarding transsexualism included in the meta-analysis were carried out in the previous century, at a time when being transgender was associated with significant stigma and endemic discrimination (Whittle, 2002), and transgender health services were scarce (Murjan, Shepherd, & Ferguson, 2002). Indeed, transsexualism was deemed to be a “rare phenomenon” in the twentieth century (Van Kesteren, Gooren & Megens, 1996). It is likely that many transsexual people did not disclose their experienced gender identity in those days, and hence prevalence studies would have underestimated true numbers.

The second issue to consider in the context of the meta-analytical prevalence for transsexualism of **Study 1** is the sex-ratio of 2.62:1 of trans females to trans males. Earlier studies in Australia (Ross, Wålinder, Lundström & Thuwe, 1981), Northern Ireland (O’Gorman, 1982) and The Netherlands (Eklund, Gooren & Bezemer ,1988) found ratios of 6.1:1, 3:1 and 3:1 respectively, showing that the majority of patients were trans females. These findings are in line with **Study 1**. However, more recent studies have shown the beginning of a levelling out of the ratios. Belgium (De Cuypere et al, 2007), Sweden (Olsson & Möller, 2003) and Germany (Garrels et al, 2000) reported ratios of 2.43:1, 1.9:1 and 1.2:1 respectively, in favour of trans females, showing that it is getting closer to a 1:1 relationship as the years go by. Recent reports on sex ratios of trans adolescents and trans adults point towards near parity (Kreukels et al., 2012), with a slight preponderance of trans males (Ahmadzad-Asl et al., 2010; Aitken et al., 2015). Various explanations have been postulated regarding the reasons for this development of an inversion in sex ratios (Aitken et al., 2015). It seems likely that sociocultural factors may contribute markedly for this inversion. It is the sex difference in degree of stigmatization that accounts for the inversion in the sex ratio. In other words, there are greater costs for a male to adopt a female gender identity than it is for a female to adopt a male gender identity (Aitken et al., 2015).

The last issue to consider in the context of the meta-analytical prevalence for transsexualism of **Study 1** is that time analysis found a clear increase in reported prevalence over the last decades. Although meta-analytical techniques allow calculating a summary estimate for a particular measurement, the correct interpretation of this summary estimate can be difficult, because a variety across results, differences in study methods, or low quality of the available data (Egger, Smith, & Sterne, 2001). When a summary measurement of association does not allow meaningful conclusions (and arguably our meta-analytical prevalence measurements do not provide meaningful clinical information), meta-analysis can still provide important information about patterns of results and their relation to study characteristics (Collin et al., 2016). With these considerations in mind, the current findings of **Study 1** should not be viewed as an attempt to obtain an average measurement of transsexual prevalence, but rather an analysis aimed to explore patterns of the reported estimates. The time analysis shows a clear increase in people who identify as transsexual. This is probably the most important finding of **Study 1**, as it highlights the requirement for planning and expansion of transgender health services in order to offer timely assessment and treatment; and workforce planning through training and education.

7.2. *RISK FACTORS*

Individuals with gender dysphoria face a significant number of difficulties in their everyday life. These difficulties include a number of interpersonal challenges, such as disclosing their gender identity (Bockting & Coleman, 2016; Rowniak & Chesla, 2013); frequent exposure to discrimination and victimisation due to their gender identity expression (Lombardi et al., 2001; Clements-Nolle et al., 2006; Goldblum et al., 2012; McNeil et al., 2012; Testa et al., 2012); intense body dissatisfaction (Smith et al., 2005; Vocks et al., 2009; Fisher et al., 2013); rejection by their family and loved ones (Koken et al., 2009; Simon et al., 2011; Budge et al., 2013); and poor self-esteem (Clements-Nolle et al., 2006; Erich et al., 2010). Consequently, individuals with gender dysphoria display a high prevalence of mental health problems (Bockting et al., 2013; Budge et al., 2013; Clements-Nolle et al., 2001), particularly anxiety and depressive symptoms (Dhejne et al., 2016) and self-harming behaviour (Claes et al., 2015; Clements-Nolle et al., 2001; Grossman & D'Augelli, 2007; Liu & Mustanski, 2012; McNeil et al., 2012; Mustanski & Liu, 2012). There is good evidence that levels of self-harming behaviour such as NSSI are high in young people (Muehlenkamp et al., 2012). Mustanski & Liu (2012) have also identified that NSSI is higher in the lesbian, gay, bisexual, and transgender (LGBT) young population compared with the general population of young people, although their study is limited by the small number of transgender youth included. Further research shows that a young age is an important risk factor for NSSI in the transgender population (Claes, Bouman, Witcomb et al., 2015; Davey, Arcelus, Meyer, & Bouman, 2016). **Study 3** show a lifetime presence of NSSI in 46.3% of young transgender patients with 28.73% reporting currently engaging in NSSI (within at least the past few months). Risk factors for NSSI, which have been identified within the general, psychiatric, and adult transgender populations, include childhood traumatic experiences, psychological symptoms (particularly anxiety and depression), levels of transphobia, poor interpersonal function, and being female assigned at birth (Claes, Bouman, Witcomb et al., 2015; Claes, Luyckx, Baetens et al., 2015; Davey, Bouman, Arcelus et al., 2015; Muehelnkamo, Ertelt, Miller et al., 2011; Young, Van Beinum, Sweeting et al., 2007). In the general population, cisgender women are reportedly three to four times more likely to self-injure than cisgender men, but NSSI appears to be more common in transgender men than in transgender women (Skagerberg, Parkinson, & Carmichael, 2013), suggesting that gender patterns of NSSI align with individuals' gender assigned at birth rather than their experienced gender. Investigating NSSI behavior specifically in young transgender people is important, because it might further identify risk and protective factors that can be modified, supported, treated, or prevented. **Study 3** found and confirms the predictive nature of psychopathology and female assigned at birth gender in

NSSI behavior. **Study 3** identified interpersonal problems, transphobia experiences, and low self-esteem as predictors of psychopathology, which in turn predict NSSI. Interestingly, the use of cross-sex hormones was not predictive of lower psychopathology, which is at odds with reports regarding the role of cross-sex hormones in the adult transgender population, where it is associated with a reduction in anxiety and depressive symptomatology (Colizzi et al., 2013, 2014; Davis and Colton Meier, 2014; Gómez-Gil et al., 2012). A possible explanation for this discrepancy may be that a significant proportion of our sample of young transgender people were prescribed GnRH analogues rather than cross-sex hormones. The latter feminize or masculinize bodies physically, but the former has no other function than to block feminizing or masculinizing sexual and physical characteristics associated with the gender assigned at birth ('puberty blockers'). Future research would benefit from investigating interventions which aim to reduce levels of psychopathology by increasing interpersonal function and improving self-esteem in the young transgender population. In addition, decreasing the levels of transphobia experience, which young people usually encounter as bullying in schools, colleges and university environments, should be a primary target towards decreasing NSSI and hence improving the quality of life of transgender young people. Furthermore, the specific role of cross-sex hormone administration in young transgender people could be studied prospectively to disentangle the role of GnRH analogues versus cross-sex hormones.

7.3. CLINICAL CORRELATES

While not all transgender people experience severe body dissatisfaction, the vast majority do (Bandini et al., 2013; Becker et al., 2016; Fisher et al., 2013; van de Grift et al., 2016). This is defined as the negative evaluation of one's appearance. As specific parts of the body play a vital role in a person's gender identity, people whose gender identity conflicts with their assigned sex may feel negatively about these specific parts. This dissatisfaction is particularly related to body parts that are a reminder of the individual's unwanted assigned gender (Becker et al., 2016). Marone et al. (1998) explored body dissatisfaction in transgender people and found a gender difference in relation to eye gaze for specific body parts. Transgender men gazed longest at their chest, suggesting that this body part caused the most dissatisfaction, whilst transgender women gazed at their genitalia longer, suggesting they were more dissatisfied with these body parts than any others. Besides genital dissatisfaction, problem areas for transgender females included posture, face, and hair, whereas transgender males appear to be mainly dissatisfied with hip and chest regions (Van de Grift et al., 2016). Transgender people may also experience dissatisfaction with or distress about parts of the body that are not related to their gender, such as weight. In order to investigate this, **Study 2** compared 200 transgender people attending a transgender health service with 200 cisgender people with eating disorders, and 200 cisgender controls. The results showed that, not surprisingly, participants with eating disorders presented with the highest body dissatisfaction of the three groups. However, transgender individuals exhibited greater body dissatisfaction than cisgender controls and, importantly, transgender men had comparable body dissatisfaction scores to cisgender men with an eating disorder. In relation to the roots of their body dissatisfaction, both transgender men and transgender women reported greatest dissatisfaction not only with gender-identifying body parts but also with body shape and weight. One of the conclusions of **Study 2** was that transgender men may be at particular risk for the development of maladaptive eating behaviours and other body image-related behaviours. **Study** 2 also found that although drive for thinness was greater in women (cisgender and transgender) compared to men, but bulimic behaviour was not. This outcome of **Study 2** suggests that a feminine identity, either assigned by birth or experienced later, may be a risk factor for eating psychopathology. Clinical practice, however, does suggest a complex relationship between the transitioning process and eating disorder psychopathology. Although at the time of assessment at a transgender health service, transgender individuals may not present with a current eating disorder or maladaptive eating behaviours, some (particularly among young people) describe a previous history of eating disorders or disordered eating. In fact, some transgender individuals in the United Kingdom, when talking about eating disorders, particularly food restriction, in transgender people use the term ‘transnorexia’ (Arcelus, Fernandez-Aranda, & Bouman, 2017). These patients explain that eating disorders or disordered eating are not uncommon among the transgender community. Whether with the aim of stopping the development of secondary sexual characteristics, or aiming to conform with internalized and/or societal values, anecdotally, maladaptive eating behaviours may be more prevalent than previously reported (Bouman & Arcelus, 2016). Studies investigating lifetime prevalence of eating disorders and maladaptive eating behaviours in the transgender population are needed.

Study 4 specifically investigated the sociodemographic and clinical characteristics of older trans people attending transgender health services as well as the influence of cross-sex hormones (CHT) on psychopathology. Transgender older adults have been largely invisible in social and health research (Bouman, 2013). They constitute an even more vulnerable subgroup within the transgender population due to being exposed to additional difficulties including ageism, discrimination in employment, lack of social and family support, and co-existing physical morbidities (Bouman & Arcelus, 2001; Bouman, Arcelus, & Benbow, 2006, 2007; Bouman & Kleinplatz, 2015a,b; McNeil et al., 2012; Orel, 2014; Witten & Eyler, 2016). **Study 4** found that the overwhelming majority of older people presenting at transgender health services over the age of 50 years old are transgender females, with a sex ratio of transgender females to transgender males of 23.7:1. This has not been documented formally in the empirical literature previously and is distinctly different from the recent reports regarding sex ratios of transgender adolescents and transgender adults, which are trending toward near parity (Ahmadzad-Asl et al., 2010; Aitken et al., 2015; Kreukels et al., 2012). Whether transgender people who transition later in life constitute a different group compared to their younger counterparts is not known and the exact etiology remains unclear. The sociodemographic characteristics of transgender people who transition later in life show that the vast majority are white, employed or retired, and divorced and have children. Trans females on CHT who came out as transgender and transitioned at an earlier age were significantly less anxious, reported higher levels of self-esteem, and presented with fewer socialization problems. When controlling for socialization problems, differences in levels of anxiety but not self-esteem remained. There are clear benefits to be derived from treatment with cross-sex hormones. In this context, it is important to re-evaluate the function as gatekeeper of transgender health services, and arguably this finding adds further evidence to support an informed consent model regarding the prescription of cross-sex hormone treatment for older transgender women. Particularly in view of the finding that more than a quarter of older transgender females had obtained cross-sex hormone treatment via the Internet without medical advice. There is a higher risk of DVT and PE associated with cross-sex hormone treatment for older transgender women (Asscheman et al., 2011; Wierckx et al., 2012), which could be discussed with patients using an informed consent model and subsequently physical monitoring via regular blood pressure measurement and blood investigations can be instigated. Whether older transgender men, who transition later in life derive psychological benefits from cross-sex hormone treatment (i.e. testosterone) should also be investigated. Given the low prevalence of older transgender men who transition later in life multi-centre research collaboration is required, such as the ENIGI network (Kreukels et al., 2012).

The last study of this thesis concerned itself with anxiety disorders, which are the most common mental disorders and the second most important cause of disoability worldwide within the group of mental and behavioural disorders (Whiteford et al., 2013; de Vries et al., 2016). **Study 5** found high rates of possible (32.8%) and probable (36.0%) current anxiety disorder in untreated transgender people attending a transgender health service. Compared with a cisgender matched control group from the general population, transgender people had an almost 3-fold increased risk of probable anxiety disorder. Trans males showed higher rates of possible and probable anxiety disorder (71.1%) than trans females (59.8%), which would be in keeping with the literature on gender differences in anxiety disorders, if the pattern of birth gender is followed (McLean et al., 2011). Studies looking as to why anxiety symptoms are more prevalent among individuals whose gender is assigned female at birth, suggest that differences in neurobiological make-up may account for these differences.

Study 5 found low self-esteem and interpersonal functioning to be predictors of anxiety disorder, which highlights the importance of psychological intervention and support in this vulnerable group. Psychological treatment aiming at improving self-esteem and interpersonal functioning may help transgender individuals at risk of developing anxiety disorder when going through the transitional process. Various psychological treatments have proven efficacious in increasing self-esteem (Morton et al., 2012; Fennel, 2006; Rigby and Waite, 2007). Similarly, interpersonal psychotherapy (IPT) has been found efficacious in reducing interpersonal problems. As IPT has been successfully used in various populations (e.g., Arcelus et al., 2011; Hara et al., 2000; Mufson et al., 2013), it could be adapted for use within the transgender population (Budge, 2013). For those transgender patients who meet a diagnosis of anxiety disorder current treatment approaches apply, including consideration of pharmacotherapy and/or psychological treatment (Baldwin et al., 2014; Iacoviello & Charney, 2015). **Study 5** confirmed the benefits of cross-sex hormone treatment, particularly for trans women. Trans women on treatment with cross-sex hormones were found to have lower levels of anxiety disorder symptomatology. These findings add further weight to the rationale of early treatment for gender dysphoria. Moreover, it is important to eliminate health disparities affecting transgender people and to provide accessible and quality psychological and health care to this population (Cahill & Makadon, 2014).

CHAPTER 8. LIMITATIONS

There are a number of limitations which need to be considered.

1) The meta-analysis of prevalence studies in transsexualism prevalence is limited by the high heterogeneity of the included studies. This is reflected in the great variation of prevalence data from the different studies, and in the different methodologies used for the various prevalence studies. The prevalence of people requiring assessment and treatment for gender dysphoria may be more accurately estimated by looking at community studies.
2) The studies 2,3,4 and 5 have selected a specific population of treatment seeking individuals and in a country where the waiting list for a first appointment at a transgender health service is long. The results may not be generalizable to other transgender people who do not access clinical services or to other countries with different healthcare systems.
3) Data collection for the studies 2,3,4 and 5 was cross-sectional in nature. Althought this presents associations between examined variables, it does not permit causality to be determined. From the current data, it is not possible to determine whether the psychological benefits associated with the use of hormone treatment predate or are a consequence of disclosure of experienced gender and/or social gender role transition. It also may be that those with better self-esteem, less psychopathology and fewer problems with socialization feel more confident to commence treatment without medical advice.
4) The samples of studies 2,3,4 and 5 consisted of transgender individuals who were at the start of the process of gender transition and therefore these findings may not reflect the experiences of transgender people at different stages of their transition or individuals who have transitioned many years ago.
5) Studies 2,3,4 and 5 make use of self-reported questionnaires, and although most are adequately validated and have been used in transgender populations, the responses may be influenced by response bias.
6) Studies 3, 4 and 5 have not used a diagnosis to classify people, but selected a population of people who self-identify as transgender and access transgender health services for treatment. Arguably, the population selected in this way may be slightly different to the one fulfilling specific diagnostic criteria according to the ICD-10 and DSM-5.

CHAPTER 9. MAIN FINDINGS AND CONCLUSIONS

Transgender people constitute a vulnerable group with higher levels of mental health problems due to existing discrimination and victimization as well as lack of adequate treatment options and legal protection in most countries.

The current thesis aimed to investigate risk factors and clinical correlates of the treatment pathway for people with gender dysphoria. Below are the main findings and conclusions.

1) The overall meta-analytical prevalence for transsexualism is 4.6 in 100,000 individuals; 6.8 for trans women and 2.6 for trans men, which suggests a sex ratio of trans females to trans males of 2.62:1. More importantly, time analysis found a clear increase in reported prevalence over the last 50 years, which highlights the need to plan for expansion of transgender health services and training and education for a future workforce in this field.
2) Risk factors for current and lifetime Non-Suicidal Self-Injury (NSSI) in young transgender people are being a trans male and having greater psychopathology. General psychopathology could be predicted by transphobic experiences, low self-esteem, and interpersonal problems, but not by the use of cross-sex hormones.
3) Transgender individuals exhibit greater body dissatisfaction than cisgender controls and, importantly, transgender men have comparable body dissatisfaction scores to cisgender men with an eating disorder. In relation to the roots of their body dissatisfaction, both transgender men and transgender women report greatest dissatisfaction not only with gender-identifying body parts but also with body shape and weight. Transgender men may be at particular risk for the development of maladaptive eating behaviours and other body image-related behaviours.
4) The vast majority of older people presenting at transgender health services over the age of 50 years old are transgender females, with a sex ratio of transgender females to transgender males of 23.7:1.
5) The use of cross-sex hormones prior to seeking treatment is widespread among transgender females and appears to be associated with psychological benefits.
6) There are high rates of possible (32.8%) and probable (36.0%) current anxiety disorder in untreated transgender people attending a transgender health service.

7) Transgender people have an almost 3-fold increased risk of probable anxiety disorder compared with the cisgender general population.
8) Trans males show higher rates of possible and probable anxiety disorder (71.1%) than trans females.
9) Low self-esteem and interpersonal functioning are predictors of anxiety disorder in the transgender population, which highlights the importance of psychological intervention and support.

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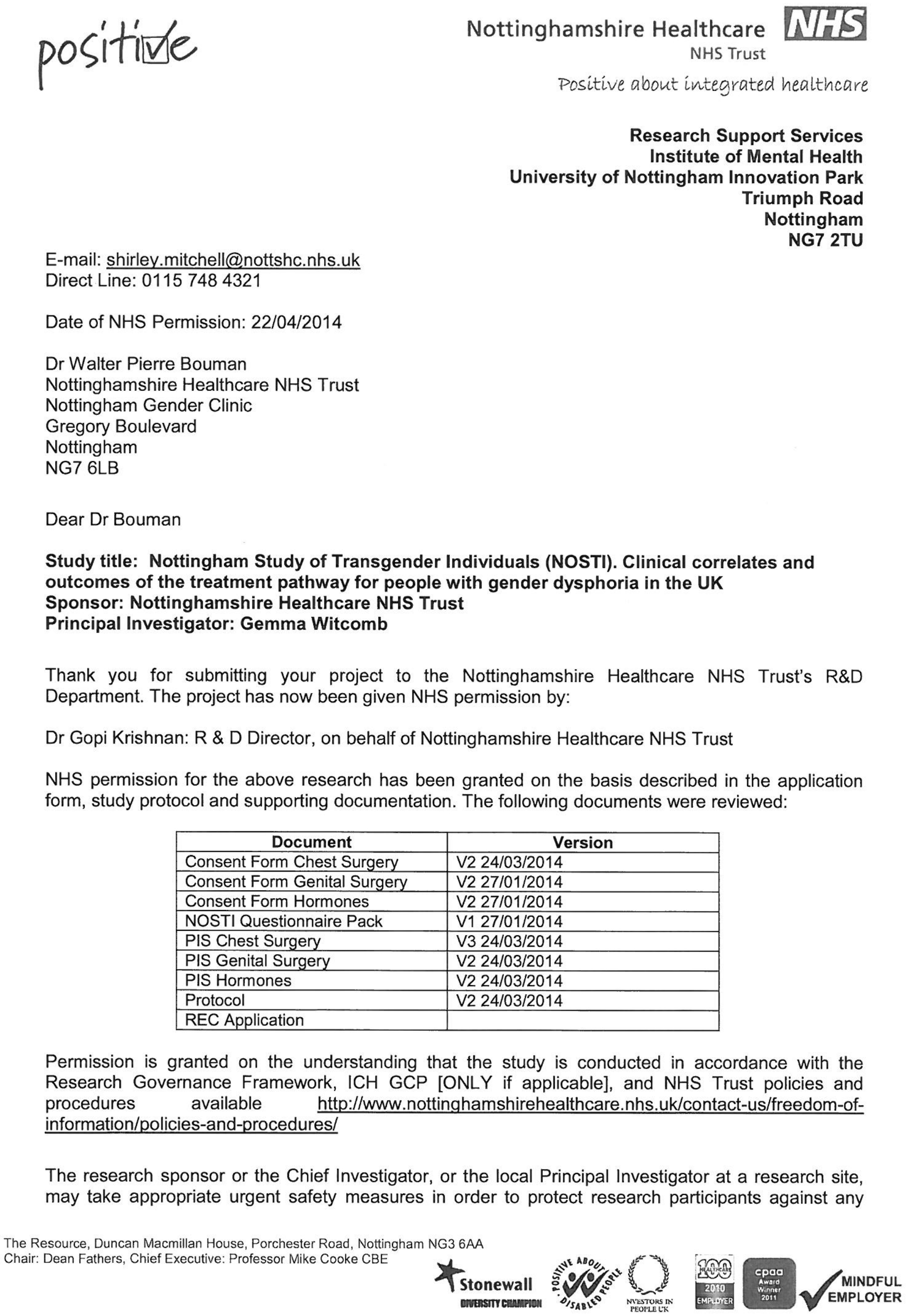
APPENDICES



Nottinghamshire Healthcare NHS
NHS Trust
Positive about integrated healthcare

Research Support Services
Institute of Mental Health
University of Nottingham Innovation Park
Triumph Road
Nottingham
NG7 2TU

E-mail: shirley.mitchell@nottshc.nhs.uk
Direct Line: 0115 748 4321

Date of NHS Permission: 22/04/2014

Dr Walter Pierre Bouman
Nottinghamshire Healthcare NHS Trust
Nottingham Gender Clinic
Gregory Boulevard
Nottingham
NG7 6LB

Dear Dr Bouman

Study title: Nottingham Study of Transgender Individuals (NOSTI). Clinical correlates and outcomes of the treatment pathway for people with gender dysphoria in the UK
Sponsor: Nottinghamshire Healthcare NHS Trust
Principal Investigator: Gemma Witcomb

Thank you for submitting your project to the Nottinghamshire Healthcare NHS Trust's R&D Department. The project has now been given NHS permission by:

Dr Gopi Krishnan: R & D Director, on behalf of Nottinghamshire Healthcare NHS Trust

NHS permission for the above research has been granted on the basis described in the application form, study protocol and supporting documentation. The following documents were reviewed:

Document	Version
Consent Form Chest Surgery	V2 24/03/2014
Consent Form Genital Surgery	V2 27/01/2014
Consent Form Hormones	V2 27/01/2014
NOSTI Questionnaire Pack	V1 27/01/2014
PIS Chest Surgery	V3 24/03/2014
PIS Genital Surgery	V2 24/03/2014
PIS Hormones	V2 24/03/2014
Protocol	V2 24/03/2014
REC Application	

Permission is granted on the understanding that the study is conducted in accordance with the Research Governance Framework, ICH GCP [ONLY if applicable], and NHS Trust policies and procedures available http://www.nottinghamshirehealthcare.nhs.uk/contact-us/freedom-of-information/policies-and-procedures/

The research sponsor or the Chief Investigator, or the local Principal Investigator at a research site, may take appropriate urgent safety measures in order to protect research participants against any immediate hazard to their health or safety. The R&D office should be notified that such measures have been taken. The notification should also include the reasons why the measures were taken and the plan for further action. The R&D Office should be notified within the same time frame of notifying the REC and any other regulatory bodies. All amendments (including changes to the local research team) need to be submitted in accordance with guidance in IRAS.

Please note that the NHS organisation is required to monitor research to ensure compliance with the Research Governance Framework and other legal and regulatory requirements. This is achieved by random audit of research.

Yours Sincerely

SMitchell

Shirley Mitchell
Head of Research Management and Governance

cc.

PI: Gemma Witcomb

Sponsor: Nottinghamshire Healthcare NHS Trust

positive

Nottinghamshire Healthcare NHS
NHS Foundation Trust

Research and Innovation
Nottinghamshire Healthcare NHS Foundation Trust
Duncan Macmillan House
Porchester Road
Mapperley
Nottingham
NG3 6AA

E-mail: shirley.mitchell@nottshc.nhs.uk

Date of NHS Permission: 30 June 2015

Prof. Jon Arcelus LMS MSc FRCPsych PhD
Consultant Psychiatrist
Nottingham Centre for Gender Dysphoria
3 Oxford Street
Nottingham
NG1 5BH, UK

Dear Jon

Demographics characteristics of young people with gender dysphoria who self harm

Following our discussions regarding your research proposal I am writing to inform you that the Trust Research and Innovation Department agree that this does not require NHS Research Ethics Committee Approval, but does require Trust R&D approval.

Generally we would require a detailed application to R&I for our records, but as this is a database compiled using data already collected then the proposal you have sent through will suffice as the research is low risk, therefore after reviewing the proposal, please accept this letter as approval for you research.

Please could you send our department a copy of the final report so we can keep it on file.

Yours Sincerely

SKMitchell

Shirley Mitchell
Head of Research and Innovation

Nottinghamshire Healthcare NHS
NHS Foundation Trust

Research and Innovation
Nottinghamshire Healthcare NHS Foundation Trust
Duncan Macmillan House
Porchester Road
Mapperley
Nottingham
NG3 6AA

E-mail: shirley.mitchell@nottshc.nhs.uk

Date of NHS Permission: 30 June 2015

Prof. Jon Arcelus LMS MSc FRCPsych PhD
Consultant Psychiatrist
Nottingham Centre for Gender Dysphoria
3 Oxford Street
Nottingham
NG1 5BH, UK

Dear Jon

Socio- Demographic characteristics of people over 50 years old with gender dysphoria

Following our discussions regarding your research proposal I am writing to inform you that the Trust Research and Innovation Department agree that this does not require NHS Research Ethics Committee Approval, but does require Trust R&D approval.

Generally we would require a detailed application to R&I for our records, but as this is a database compiled using data already collected then the proposal you have sent through will suffice as the research is low risk, therefore after reviewing the proposal, please accept this letter as approval for you research.

Please could you send our department a copy of the final report so we can keep it on file.

Yours Sincerely

SMitchell

Shirley Mitchell
Head of Research and Innovation

The Resource, Duncan Macmillan House, Porchester Road, Nottingham NG3 6AA
Chair: Professor Dean Fathers, Chief Executive: Ruth Hawkins

positive

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E-mail: shirley.mitchell@nottshc.nhs.uk

Date of NHS Permission: 27 January 2016

Dr Walter Pierre Bouman MD MA MSc FRCPsych UKCPreg
Consultant Psychiatrist-Sexologist/Head of Service
Nottingham Centre for Gender Dysphoria
3 Oxford Street
Nottingham
NG1 5BH, UK

Dear Walter

Gender Dysphoria, mental health and autism spectrum disorder: A comparative study between trans people and the general population

Following our discussions regarding your research proposal I am writing to inform you that the Trust Research and Innovation Department agree that this does not require NHS Research Ethics Committee Approval, but does require Trust R&D approval.

Generally we would require a detailed application to R&I for our records, but as this is a database compiled using data already collected then the proposal you have sent through will suffice as the research is low risk, therefore after reviewing the proposal, please accept this letter as approval for you research.

Please could you send our department a copy of the final report so we can keep it on file.

Yours Sincerely

Mitchell

Shirley Mitchell
Head of Research and Innovation

The Resource, Duncan Macmillan House, Porchester Road, Nottingham NG3 6AA
Chair: Professor Dean Fathers, Chief Executive: Ruth Hawkins

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CURRICULUM VITAE

Walter Pierre Bouman was born on October 4th, 1961 in Sliedrecht, the Netherlands. After he finished gymnasium-β at the Praedinius Gymnasium in Groningen, he started at Groningen University in 1980, initially studying Economics for one year before switching to medicine at the Rijks Universitair Centrum Antwerpen (RUCA) in Belgium. He continued medicine in 1982 at Groningen University in the Netherlands. His clinical internships were spent at the University Hospital in Groningen and at St Elizabeth Hospital in Willemstad, Curaçao. His elective internship of 6 months was spent at the Goshen Mental Health Unit in Goshen, New York, USA (Supervisor: Dr Nalayini Sriskandarajah). He qualified in September 1990. He was appointed registrar in psychiatry in February 1991 and trained for 18 months at St Nicholas Hospital in Great Yarmouth, United Kingdom on the East Anglia Rotating Registrar Scheme (Supervisor: Dr Paul MacMahon). In September 1993 he continued his training as a trainee psychiatrist at APZ Dennenoord in Zuidlaren, the Netherlands (Supervisors: Dr Frits Milders and Dr Jan-Rink Niemantsverdriet). Walter continued his training in old age psychiatry at the Department of Healthcare of the Elderly (Supervisor: Prof. Rob Jones) at the University Hospital in Nottingham, United Kingdom, where he was appointed as a Consultant Psychiatrist in November 1998. He further obtained a MSc in the theory and practice of psychotherapy for sexual dysfunction at the Porterbrook Clinic (Supervisor: Prof. Kevan Wylie) and Sheffield Hallam University in Sheffield, UK in 2005. He qualified as a couple psychotherapist with the United Kingdom Council for Psychotherapy (UKCP) in 2007, and became an accredited supervisor with the College of Sexual and Relationship Therapists in 2010. Walter obtained a MA in medical ethics and law from the University of Keele in Keele, United Kingdom in 2012 (Supervisor: Prof. Alex Sharpe).

Since 2007 Walter works as consultant psychiatrist-sexologist and head of service of the Nottingham Centre for Transgender Health (previously known as the Nottingham Centre for Gender Dysphoria). Currently, Walter serves the World Professional Association of Transgender Health (WPATH) as Treasurer and Executive Board Member. He is former Deputy Editor of *Sexual and Relationship Therapy - International Perspectives on Theory, Research and Practice* (2007-2016) and current Editor-in-Chief of the *International Journal of Transgenderism.* He is a member of the WPATH Standards of Care Committee (SoC8).