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GENDER DIVERSITY IN ASSIGNED FEMALES

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Summary of the MRP Portfolio

Section A: Presents a systematic review and critique of the literature exploring the experience of gender in assigned females with autism or autistic traits. Little evidence was found for a masculinised experience, but support was found for a 'non-conforming', gender blind or gender neutral experience of gender. Clinical recommendations include: considering the impact of and seeking to change current androcentric practices around autism, and being attentive to the compound challenges autistic gender diverse people may face in a neurotypical, cisgendered world. Further research exploring the experiences and perspectives of people with these experiences is recommended.

Section B: Presents a mixed-methods multiple case study which aimed to explore the experiences and expectations of puberty for gender diverse young people, assigned female at birth. Measures of Intolerance of uncertainty and pubertal knowledge were included. Data was analysed within and between cases to provide a rich insight into individuals' own experience in addition to any convergent themes across the sample. Conflicting experiences of puberty, differences with peers and pressures to fit binary stereotypes were reported and discussed with consideration of varied levels of intolerance of uncertainty and pubertal knowledge.

Contents

Page

Section A

Section B

List of Tables Section A

List of Figures Section A

List of Tables Section B

Section C

Section A

Exploring the experience of gender in assigned females with autism or autistic traits.

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Abstract

Background

Current research investigating the experiences of people with autism is largely androcentric. Although the predominance of assigned male diagnosis is being challenged, male stereotypes still remain. High levels of co-occurring Gender Identity Disorder and autistic traits have been reported by services and in the literature. Exploring the experiences of gender for assigned females with autism is an important first step in learning more about this co-occurrence.

Aim

The current review aims to use a systematic search process to gather, review and critique the current literature exploring the experience of gender in assigned females with autism or autistic traits.

Method

A search of three electronic databases (Applied Social Sciences Index and Abstracts, Child Development and Adolescent Studies and Psychinfo) was conducted yielding thirteen papers which met the review's inclusion criteria.

Results

The papers discussed in this review highlight the different approaches to measuring gender variance and experience. Little evidence was found for a masculinised experience, but support was found for a 'non-conforming', gender blind or gender neutral experience of gender for assigned females with autism or autistic traits.

Conclusion

Implications for professionals working with children or adults with autism are discussed along with areas for future research.

Keywords: Autism, gender, female, gender diversity, literature review

Introduction

Background and context

Autistic Spectrum conditions (ASC) have long been conceptualised as predominantly 'male' diagnoses. Although it is true that a significant difference in diagnostic rates is seen across the sexes, 4.3:1 male/female (Fombonne, 2005), the validity and reliability of these ratios are now being challenged. Recent studies have demonstrated greater uncertainty around these ratios, Lai et al. (2015) predicted a ratio within the ranges of 2:1 to 5:1 (male: female), and recent review conducted by Loomes, Hull and Mandy (2017) predicted a ratio nearer to 3:1 when looking at 'high quality studies'.

Many theories have accepted the male prominence in diagnoses and have therefore sought to explain why autism is more often experienced by men in comparison to women. An example of these explanations is seen in the work of Baron-Cohen (2002; 2009) in which it is proposed that autism is an "extreme manifestation of the male brain". The extreme male brain and associated empathising-systemising hypotheses both characterise autism in terms of stereotypical male strengths, weaknesses and behaviour. These approaches have prompted further exploration into potential biological mechanisms underlying the male prevalence of the condition (Baron-Cohen et al. 2011). Although Baron-Cohen acknowledges that behaviours may be influenced by social and environmental factors, his suggestions that gender differences are observed and maintained from infancy and throughout life are indicative of the biological aetiology. Critiques of the 'extreme male brain hypothesis' have come from autistic women who have discussed the theories' reductionist and damaging impact upon how they view themselves and how they are perceived by others (Jack, 2012).

Conversely, there is a growing literature base which questions the validity and reliability of current diagnostic methods, suggesting that similar differences may also exist in women, but are commonly neglected or misdiagnosed (Duvekot, van der Ende & Verhulst et al. 2017; Gould & Ashton-smith, 2011). Tierney and Burns (2017) comment upon the cyclical and tautological nature of theory, research, and clinical practice which has acted to maintain and reinforce androcentric perspectives of autism. They discuss the higher threshold required for girls to meet criteria for diagnosis, and conversely the increased likelihood of diagnosis experienced by girls who display fewer 'female characteristics' which are thought to be 'protective'. The authors not only highlight that girls may be less likely to be referred for autism diagnosis due to gender stereotyping, but they also argue that if they do reach the assessment stage that the instruments used for diagnosis have been designed with the male phenotype as the focus.

Given this context, it is unsurprising that research into autism has predominantly focused upon the experiences of males. Research exploring the relationship between sex, gender and autism is gradually revealing some light on the experience of autism for women. Whether or not autism assessments are valid, evidence suggests that men and women with autism present differently. Wilson et al. (2016) found that within adults diagnosed with high-functioning autism, men had significantly more repetitive behaviours/restricted interests than women. Literature reviews conducted by Kirkovski, Enticott and Fitzgerald, (2013) and Lai, Lombardo, Auyeung, Chakrabarti and Baron-Cohen (2015) have reported similar results, also commenting upon differences in developing friendships, play behaviours and imaginative skills. The different presentations seen between autistic men and women raise the question as to why these differences may exist. Tierney and Burns (2017) propose that explanations fall into three common areas; different symptom expression i.e. variations in line with sex

differences that exist in the general population. Differing developmental trajectories, for example differences in the pace and time in which boys' and girls' social and cognitive skills develop, therefore meaning that the impact of social deficits may not be present in girls until there is pressure for new social demands. Finally, "blending in" which they describe as a propensity for girls with autism to mask their autistic symptoms in order to blend in with peers. This 'camouflaging process' along with attempts to fit in with gendered social expectations have been described by autistic women as exhausting (Lawson, 2017; Ratto et al., 2017).

Gender appears to have significant effects on both the presentation of people with autism, but also on how people with autism are perceived by others. This is not only demonstrated in the empirical literature discussed above, but is also seen in popular media portrayals of autism, which although are gradually changing, continue to present autism in line with stereotypical perceptions of masculinity. Davidson and Tamas (2016) discuss portrayals of autism in the media such as 'Rain Man' and 'The Curious Incident of The Dog in the Night-time' which tend to depict stereotypical understandings of autism in terms of masculine strengths in systemising. However, the authors also present what they describe as a more 'troubling' side of the experience of gender, in which many personal accounts from people on the autistic spectrum describe an experience of gender which is barely present at all. They report accounts from autistic people who describe the emotional labour required to 'do' gender 'typically', as well as the accounts of those who explicitly reject the construction of gender and the social expectations that ensue. Similar accounts have been shared by Meyerding (2003) in "Growing up Genderless" where she describes her experiences that gender does not serve as an available resource for her identity, but feels that it is incomprehensible and inapplicable. Jack (2012) quoted an online post from Amanda Baggs

(2009), who wrote *"gender is a concept that, while I understand intellectually that it is greatly important for other people, is entirely incomprehensible to me".* Jack describes how although the 'gender-blindness' as described by Meyerding and Baggs may be experienced by some as a freedom from gendered stereotypes, others are left with a sense of lost identity and not knowing quite where they fit in.

The differently gendered experiences of autistic people have also gained attention within clinical services due to high rates of people with autism attending Gender Identity Development services across the world (Kaltiala-Heina, Sumia, Tyolajarvi & Lindberg, 2015; Skagerberg, Di Ceglie & Carmichael, 2015; Wood et al., 2013). High levels of gender variance have also been reported when looking at gender in the autistic population. Strang et al. (2014) reported that participants with an autism diagnosis were 7.59 times more likely to express gender variance in comparison to neurotypical peers. These findings have also come about in a time in which gender services are experiencing a shift in terms of the assigned gender of people accessing their services. Historically, referrals to specialist Gender Identity Development services were most commonly received for young people who were assigned male at birth, whereas in recent years there has been an influx of adolescent assigned females (Aitken et al. 2015; de Graaf, Giovanardi, Zitz & Carmichael. 2018). Considering these findings it may be unsurprising that these services are also reporting an over-representation of autistic females (Kaltiala-Heina, Sumia, Tyolajarvi & Lindberg, 2015; Skagerberg, Di Ceglie & Carmichael, 2015).

The experiences of autistic people and specifically autistic women have gained attention in recent years, both in terms of challenging masculine stereotypes surrounding the condition, but also in terms of how it may, or may not interact with constructions of gender,

gender identity and gender dysphoria. To date, reviews exploring gender in autism have been limited to exploring gender differences in autism (Lai et al. 2015) or have focused on clinical narratives around autism and gender dysphoria (Glidden, Bouman, Jones & Arcelus, 2016). A brief review conducted by van Schalkwyk, Klingensmith and Volkmar (2015) commented on some of the conceptual challenges faced within this area, recommending that a more complex approach considering gender in developmental terms may prove most useful.

The literature discussed speaks of some of the challenges faced by autistic women navigating a largely neurotypical and cis-gendered world. However, no review to date has attempted to capture the experiences of autistic women in terms of how they perceive, relate to and experience gender.

Aim

The current review employed a systematic search methodology in order to explore what we know of the experience of gender in autistic birth assigned females. The review aims to synthesise the current literature whilst also providing a critique on the quality of the papers presented. Implications for research and clinical practice will also be discussed.

Note on terminology and conceptual challenges

A range of terminology is used in the literature and in colloquial language to describe gender variance and autism. This variation in terminology creates a number of conceptual challenges when reviewing the literature. Efforts have been made throughout this review to consider the impact of the different terminology used, and the impact this may have on

specific papers and the overall review. Below is a description of some of the common terminology and other related terms that will be used in the review.

Gender Dysphoria is a diagnostic term from the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) (APA, 2013). It is used to describe individuals presenting with incongruence between their assigned sex at birth and their experienced gender. The diagnosis may be characterised by distress of one's own biological sexual characteristics, assigned gender role and strong and persistent cross gender identification. In the recently released 11th edition of the International Classification of Diseases and Health Related Problems (ICD)(World Health Organisation, 2018) a change was made to reclassify what were known as 'gender identity disorders' to 'gender incongruence'. This was a significant change sought to move away from mental health frameworks around different experiences of gender.

There are a number of terms used in the literature to describe experiences of gender. Although this review has included papers looking at those with a diagnosis of Gender Dysphoria (GD) it aims to focus on gender variance as described by the individual, therefore the term 'gender variance' is privileged. The term gender variance aims to encapsulate a range of experiences or expressions that may not match typical gender norms.

Some literature uses terms such a 'birth sex' or biological sex', in this review the term 'assigned sex at birth' has been used to encompass these terms and distinguish from current gender which may differ from assigned sex at birth. The term 'cisgender' is used to describe a person whose sense of identity and gender align with their assigned sex at birth.

There continues to be debate in both the research and autistic communities regarding preferred terminology regarding autism. The search methodology described below aims to encompass the full range of terminology used to describe people with high levels of autistic traits. Within this review the term 'autistic women' has been chosen in line with literature suggesting that the term 'autism' and 'autistic person' as opposed to person-first language is preferred by autistic people (Kenny et al. 2016; Autistichoya, 2011). When discussing people with autistic traits the term 'neurotypical' is frequently used to discuss those without autistic traits. Within the research reviewed a 'neurotypical' group are often used as the control group.

Method

A search of relevant literature was conducted using three electronic databases: Applied social sciences Index and Abstracts (ASSIA), Child Development and Adolescent Studies and Psychinfo. Each of the databases were searched on the 16th February 2019, and the date range used for searches was from database inception until the 16th February 2019.

Search terms

When searching ASSIA and Child Development and Adolescent Studies the following search terms were used in order to ensure that a wide scope of papers were found:

- Autis* OR Asperger (in article title)

AND

- Gender (in article title)

AND

- Wom* OR fem* OR girl (in text or as keyword)

The reference sections, citations and Google scholar were also searched for relevant papers, this search revealed three more papers. See Figure 1 for a flow diagram further detailing the search process.

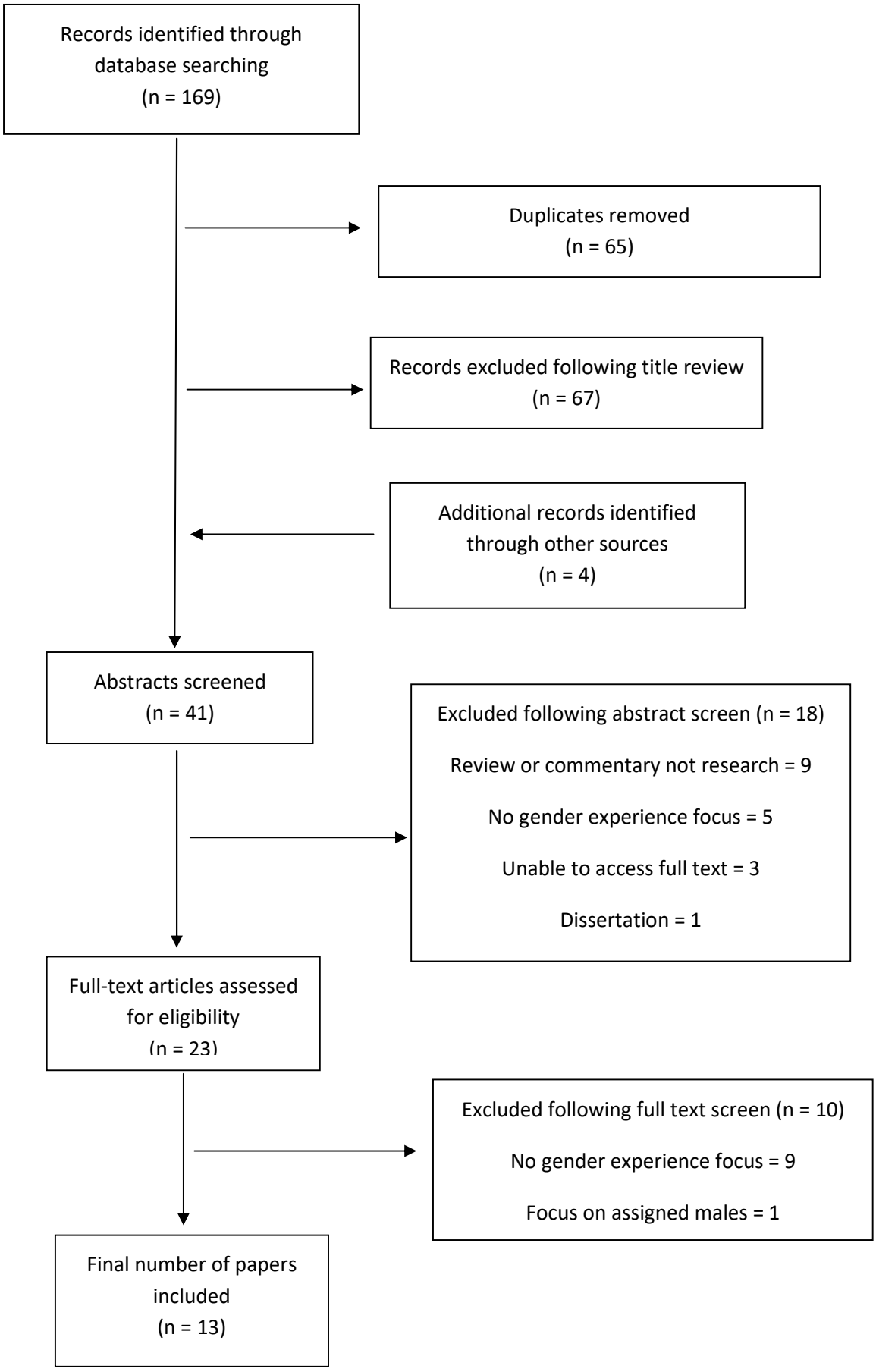

Figure 1: Flow diagram depicting systematic search process

Eligibility criteria

A number of papers were excluded as they did not meet the inclusion criteria. Many of the papers focused upon gender differences in autistic diagnosis and presentation as opposed to gender as experienced by people with autism, therefore papers were excluded where no attention was given to gender experience.

Inclusion and Exclusion Criteria for Systematic Search

Inclusion criteria	Exclusion criteria
Gender experience focus	Not written in English
Primary research	Recruited participants assigned male at birth only
Some content on experience of assigned females at birth	Not peer reviewed (i.e. Dissertations)
Included participants with an autistic spectrum condition diagnosis or autistic traits	

Table 1

Several papers identified in the literature search reported upon the co-occurrence or incidence rates of autism diagnoses and gender dysphoria/ gender identity disorder. Many of these papers were excluded from the review due to lacking discussion of gender experience other than a dichotomous measure, such as presence or absence of Gender Dysphoria. One such example is Strang et al. (2014) which was screened out after a full text review because although the authors aimed to measure ‘gender variance’ using an established questionnaire

(the Child Behaviour Checklist, CBCL) (Achenbach, 1999) the results of this were reduced for the analyses into two groups; those with no wish to be the other gender and those who sometimes or often wished to be the other gender, with no further discussion of gender variance.

Identified literature

Thirteen papers were identified through the systematic search; five papers used qualitative approaches (Bargiela et al. 2016; Cridland et al. 2014; Kanfiszer et al. 2017; Kuvalanka, Mahan, McGuire & Hoffman, 2018 & Strange et al. 2018), five used case control designs (Bejerot & Erikson, 2014; Cooper, Smith & Russell, 2018; Dewinter, De Graaf & Begeer, 2017; George & Stokes, 2018; Stauder, Cornet & Ponds, 2011), two used cross-sectional designs (Kristensen & Broome, 2015 & Walsh, Krabbendam, Dewinter & Begeer, 2018) and one paper reporting a single case study was also included (Kraemer, Delsignore, Gundelfinger, Schnyder and Hepp, 2005). Three of the qualitative papers (Bargiela, Steward & Mandy, 2016; Cridland, Jones, Caputi & Magee, 2014 and Kanfiszer, Davies & Collins, 2017) and the case study (Kraemer et al. 2005) included only participants assigned female at birth, all other papers included both assigned females and males.

All but one paper sought to research autistic people in terms of having a diagnosis of Autistic Spectrum Condition; Kristensen and Broome (2015) used a broader criteria investigating 'autistic traits'. Nine of the papers investigated the experiences of adults, with four papers exploring the experiences of children and adolescents.

Three papers included investigated gender in terms of 'Gender Dysphoria' (GD) or 'Gender Identity Disorder', four papers utilised broader terms such as self-reported gender

variance or gender non-conforming and the remaining six papers investigated experiences of gender in terms of gender role behaviour, gender self-esteem or gender identification.

Quality of the papers

To aid in assessment of the quality of the paper various quality checklists were chosen depending on the method used in the study. Checklists created by the Joanna Briggs Institute (JBI) were used to review case control studies, cross-sectional studies and the case report. The Joanna Briggs Institute is a research and development organisation based in the faculty of Health and Medical Sciences at the University of Adelaide that offer a range of systematic review tools. Guidelines adapted from Elliot, Fischer and Rennie (1999) were used to aid assessment of the qualitative papers included in the review. Discussion regarding the quality of papers will be included throughout the review, a summary of common critiques across the papers is provided in the overall critique section and further information can be found in appraisal tables in the Appendix section (Appendices A – D).

Review

Structure of the Review

The review will be structured using pertinent themes raised by the papers included. The main findings of the papers will be discussed and contrasted. Critiques of the literature will be presented throughout the review and an overall critique of the literature will follow.

A summary of the papers reviewed has been included in Table 2 below. The review begins by discussing themes of masculinity and femininity in the papers, the next section outlines different experiences of gender, or gender non-conforming. The final section summarises the papers' discussion of ideas around gender blindness and gender neutrality.

Table 2

Study Characteristics

Author	Focus of Paper	N	Design/Method	Main Findings/Themes	Main strengths/Limitations
Bargiela, Steward & Mandy (2016)	'Female autism phenotype' of late-diagnosed women.	14 autistic women Age: 18 – 35.	Qualitative Semi-structured interviews Framework Analysis.	"you're not autistic" Pretending to be 'normal' Passive to assertive Forging an identity as a woman with ASD	Non-typical autistic population – most participants had above average IQ, and more in work than expected than in the general autistic population. Focus on late-diagnosis may have biased results. The needs of this population may be distinct.
Bejerot & Eriksson (2014)	Investigating patterns of non-cognitive sexually dimorphic traits Between autistic and NT adults	103 adults 50 autistic (26 men, 24 women) 53 NT (28 men, 25 women) Age: 20 - 47	Quantitative Questionnaire Case control study	Masculinity was weaker in autistic group across men and women. Self-perceived gender typicality did not differ between the groups, but 'tomboyism' and 'bisexuality' were overrepresented amongst autistic women.	Non-typical autistic population - parenthood and university education was higher in the autistic group than estimated in the general autistic population. Mix of validated and non-validated measures.
Cooper, Smith & Russell (2018)	Investigating whether having Autism effects gender identification and gender self-esteem.	486 adults 215 autistic (101 women, 114 men) 267 NT	Quantitative Questionnaire Case control design	Autistic natal females had lower gender identification and self-esteem than natal autistic natal males and td females. Autistic females showed grater variance in gender expression,	Large study, but little detail Good focus on social processes related to, but distinct from gender identity – self-esteem and gender identification

		(153 women, 114 men) Age: 16 - 80		reporting lower femininity and higher masculinity	
Cridland, Jones, Caputi & Magee (2014)	Exploring the experiences of autistic adolescent girls and their families.	3 mother-autistic daughter dyads plus 2 additional mothers Daughters age: 12 - 17	Qualitative Multiple case study approach using IPA	Diagnostic issues Being surrounded in boys Experiences of high school Complexity of adolescent female relationships Puberty and its related issues Sexual relationships and concerns	In depth - from participants own perspective Small homogenous sample
Dewinter, Graaf & Begeer (2017)	Comparison of sexual orientation and romantic relationships in autistic population compared with NT population	8739 adolescents and adults 675 autistic 8064 NT	Quantitative Case control study	Notable number of autistic group (more women) reported gender non-conforming feelings More autistic people, especially women reported sexual attraction to both same and opposite sex-partners	Large data set – but limited number of adolescents. Questionnaire limited in depth Unvalidated measure of gender identity
George & Stokes (2018)	Comparison of gender dysphoric traits in autistic and NT population	571 adults 310 autistic (male 90, female 219, 1 intersex) 261 NT (103 male, 158 female)	Quantitative Case control study Online survey	Higher number of GD traits in autistic population. Relationship between autism and sexual orientation was mediated by GD traits Autistic females had higher scores on the 'gender dysphoria subjective scale'	Self-selecting sample – may not be truly representative Large representation of autistic females. Participant feedback suggested that a qualitative approach on sexuality and gender might have been better suited.

Kanfiszer, Davies & Collins (2017)	Experiences of autistic women in terms of gender and social relationships	7 autistic Women Age: 20 – 59	Qualitative Semi-structured interviews Narrative inquiry analysis	'I was just so different' 'I think there's a gender identity thing' 'I've never had any mothering instincts' 'When I try, the conversation just goes dead' 'People didn't want to know me'	In-depth interviews allowed for rich data. Inclusion of those with intellectual difficulties. Minimal ethnic diversity due to small sample.
Kraemer, Delsignore, Gundelfinger, Schnyder & Hepp (2005)	Comorbidity of Asperger's and GID	35 year old assigned female, identifies as male	Qualitative: Case report	Low femininity and high masculinity on 'personal attitudes questionnaire. Authors proposed GID as secondary feature of Asperger's – Asperger's interpreted as masculine and paved the way for developing GID	Single case study – no methodological rigour guidelines considered. Tests rather than interview – leading to narrow understanding/concepts of how Asperger's and Gender is experienced
Kristensen & Broome (2015)	Investigated autistic traits within adults with 'gender identities other than that which they were assigned at birth'	446 adults 142 assigned female at birth 252 assigned male at birth 14% autistic	Quantitative Cross sectional Questionnaire	Higher number of autistic traits were seen in those defining as male as opposed to female. Higher number of autistic traits seen in those assigned female at birth. 'genderqueer' group showed highest number of autistic traits.	Inclusion of a range of gender identities – not limited to those experiencing GD. Sample not random due to snowball sampling. Although attempts were made to avoid community bias within the sample.
Kuvalanka, Mahan, McGuire & Hoffman	Exploring how mother of trans/gender non-conforming children view their child's	3 mothers of autistic Trans and gender-nonconforming children aged 6-12	Qualitative In-depth interviews	Fear of transphobia/cisnormativity autism causing gender nonconformity? Challenges Lack of adequate support/resources Positive intervention and resources	Small sample allowed for in-depth, rich data Homogenous sample – all identified as white.

(2018)	autism and gender	One child was assigned female		Medication	Only gained perspectives of mothers, not children.
Stauder, Cornet & Ponds (2011)	Investigate gender role behaviour in autistic and non-autistic adults.	50 Adults 25 autistic 32 men, 18 women	Quantitative Case-control study	Both assigned males and females scored lower on the masculine gender role when compared to controls. Females scored similarly on the feminised gender role when compared to controls.	Small sample for case-control study, although comparisons were made with normed data of questionnaires. Controls were not comparable - students and family members of the researchers.
Strang et al. (2018)	Exploring key themes in the life experiences and perspectives of autistic gender-service seeking adolescents	22 autistic adolescents with diagnoses of Gender Dysphoria 14 trans women 6 trans men 2 non-binary	Qualitative In depth, semi-structured interviews Framework analysis	Urgent needs Dysphoria with body and social gender roles Impact of neurodiversity Gender exploration and expansiveness Often androgynous Bias and harassment Confidence in future	Predominantly white, average to above average verbal intelligence, time limited - 22months FA – used team for analysis, codes checked by stakeholders
Walsh, Krabbendam, Dewinter & Begeer (2018)	Comparing self-reported autism traits and sensory differences between participants with autism who did or did not identify with their	669 autistic adults 322 assigned male; 347 assigned female	Quantitative Cross-sectional Questionnaire	Broad elevation of most cognitive autism traits in the trans and non-binary group, in addition to lower visual and auditory hypersensitivity. Non-binary identities showed most elevated levels of cognitive autistic traits.	High proportion of assigned females may not be reflective of the general population. Screening measures used may be too general to test for differences between groups. Confounding factors which may

	assigned sex.	impact scores on the AQ, such as levels of distress, have not been considered.

Note: IQ = Intelligence Quotient. NT = Neuro-typical. GD = Gender dysphoria. GID = Gender Identity Disorder. Gender is specified in same terms used in paper presented.

Masculinity and Femininity

Given the largely androcentric focus of theories and research around autism, it is unsurprising that concepts of masculinity are present in the literature reviewed. Eight of the thirteen papers reviewed utilised concepts of masculinity and femininity in order to explore gender variance within people with autism. Most of the qualitative papers (Bargiela et al. 2016; Cridland et al. 2014; Kanfiszer et al. 2017; Kraemer et al. 2005, & Kuvalanka et al. 2018) included some mention of gender expression in terms of masculinity and femininity, whilst three of the papers utilising quantitative methodologies discussed these concepts (Bejerot & Eriksson, 2014; Cooper et al. 2018 & Stauder et al. 2011).

Since masculinity and femininity can carry different meanings dependent upon the gender in which one identifies, the review of the papers in this section has been divided to reflect and respect the differences in these experiences.

Masculinity and Femininity in autistic people assigned female at birth identifying as something other than female. Both the case report conducted by Kraemer et al. (2005) and the in-depth case study interviewing three mothers of transgender and non-conforming children by Kuvalanka et al. (2018) discuss the concepts of masculinity and femininity in autistic people, assigned female at birth who identify as male. Strang et al. (2018) did not explicitly discuss gender expression in terms of masculinity or femininity but reported upon similar themes regarding dysphoria experienced with typical social gender roles.

The case of a Swiss 35-year-old assigned female at birth but identifying as a boy for as long as they can remember was presented by Kraemer et al. (2005). The authors report that a diagnosis of 'Asperger's' was given when they were 33 years of age. A range of assessments including the Personal Attitudes Questionnaire (Runge, Frey, Gollwitzer, Helmreich, & Spence, 1981) were used to assess masculine 'instrumental' and feminine 'expressive' traits. They concluded that the case presented demonstrated lower femininity and

higher masculinity scores when compared with male controls. They hypothesised whether the adoption of a male identity may have enabled the person concerned to better integrate their experiences of strong logical skills and relative lack of emotionality.

Kuvalanka et al. (2005) conducted in-depth interviews exploring how parents of transgender children describe their child's development. Three mothers of transgender or gender non-conforming children, living in the Western United States were interviewed, only one of which was assigned female at birth (Alex). Alex's mother spoke about a particular event which she felt precipitated a change in Alex's thinking regarding his gender. This event was a friend's birthday party in which they engaged in a number of 'girly' activities which Alex reported feeling disgusted by. It is interesting to note that although a rejection of femininity was discussed, no reports were discussed regarding a preference of masculine typical behaviour. Similarly, in the study conducted by Strang et al. (2018) exploring key life experiences of 22 autistic adolescents with diagnoses of GD, themes regarding dysphoria with social gender roles were discussed. Strang et al. (2018) demonstrated this with the following quote: "when I'm forced to play the part of the girl and wear dresses and makeup I feel like crying."

All three papers comment upon experiences of not fitting in with female peers, or perceived female stereotypes, describing a rejection of femininity accompanied with a male gender identification. Kraemer et al. (2005) suggested that Gender Identity Disorder in the case they presented may be considered as a secondary feature to autism whilst Kuvalanka et al. (2018) report more tentative concerns from Alex's mother that autism and gender may be interconnected rather than suggesting a causal link. The examples above provide valuable in-depth insights into the lives of the individuals presented.

Masculinity and Femininity in Autistic women identifying with their assigned sex. Six of the reviewed papers look at experiences of masculinity and femininity in those identifying as female, three of these papers are quantitative, and three are qualitative. The papers will be discussed individually with a comparison at the end.

Cooper et al. (2018) conducted an online case-control study of 486 adults which sought to measure gender identification and gender self-esteem in combination with measuring aspects of 'masculine' and 'feminine' self-expression in both autistic and non-autistic adults. They found that autistic people experienced lower levels of gender identification and lower gender self-esteem in comparison to their neurotypical peers. Autistic women experienced the lowest levels of gender identification in comparison to all groups. The authors also reported that autistic women held more negative feelings about their assigned gender group in comparison to autistic men and both neurotypical groups. In line with their predictions, the presence of autism was a significant predictor of higher levels of 'masculinity' and lower levels of 'femininity' within autistic females. However, they also reported that autistic males reported lower levels of 'masculinity' than their neurotypical peers. Although the authors may be criticised for relying upon a crude measurement of 'masculinity/femininity' (using two Likert scales to self-report "how masculine/feminine would you rate yourself?") these findings do suggest a difference in the gender expression of people with autism when compared to neurotypical peers which has also been reported in other papers reviewed.

Bejerot and Eriksson (2014) reported a somewhat different 'gender-atypical' pattern of characteristics experienced by people with autism in their study. They sought to explore 'gender role' in a case control study of 103 Swedish adults. In order to measure 'gender role' the authors utilised a modified version of the Bem Sex Role Inventory (Bem, 1974), which

asks participants to rate their agreement on female and male stereotypes (although the original version of the scale also explores levels of androgyny this was not commented upon within the study). The male subscale used included statements regarding power, assertiveness, leadership and competitiveness whilst the female subscale included statements regarding tenderness, caring and submission. Although we may criticise the validity of these constructions of female and male stereotypes in terms of informing us about gender role or expression, the differences observed between autistic and non-autistic participants are important to consider. Using this measure the authors found that stereotypical male patterns were weaker in the autism group, across both assigned men and women. In addition, they also found that autistic women were more likely to report 'atypical gender identity' and rated themselves as being more 'tomboyish' in childhood when compared to their neurotypical peers. The findings may raise the question as to whether autistic individuals related less to both masculine and feminine stereotypes rather than merely presenting as more masculine.

Similar findings were presented by Stauder et al. (2011) who conducted a case control study with 50 Dutch adults, again exploring gender role behaviour across autistic and non-autistic adults. Using a shortened version of the Minnesota Multiphasic Personality Inventory-2, they reported finding that both males and females with autism scored lower on the masculinity scale when compared with their neurotypical peers. Contrary to their predictions that autistic women would also score lower on the femininity measure, they found that scores did not significantly differ between autistic and non-autistic women. Although this study again used a limited measure of gender role, it points towards a less clear-cut experience of gender than may be expected.

In contrast to the reports presented above, the remaining qualitative papers discuss themes of masculinity and femininity as experienced by autistic people and those around them, as opposed to measuring these concepts based upon a constructed measure. Kanfiszer et al. (2017) conducted a narrative analysis with seven women, living in the UK, who received a diagnosis of autism in adulthood. Their aim was to explore what this means and how it feels to be an autistic woman. The authors reported that a number of the women shared experiences of not adhering to gendered expectations. They describe the women feeling that their interests were more aligned to the interests of their male peers than female peers. One woman was quoted as not feeling like a "girly girl", whilst themes of discomfort with female physiology and the intrinsic link to femininity, reproduction and mothering stereotypes were also discussed. It is interesting to note that although the authors did not report explicitly enquiring about gender, these experiences were still identified as themes across the participants' narratives. This may suggest the significance of experiences of gender within late-diagnosed autistic women that may be shared by others.

Cridland et al. (2014) reported upon similar themes in their paper where interviews were conducted with three mother-daughter dyads and two additional mothers of adolescent autistic girls, all of whom lived in Australia. A theme reported by the authors, termed 'being surrounded by boys', discussed the mother's perceptions of their daughters as 'being different' from the other girls and getting along with boys better. Another theme 'complexity of adolescent female relationships' also highlighted differences between the autistic girls' experience and that of their female peers, with one mother describing her daughter as "not a girly girl". The mothers reported disinterest shown by their daughters in typically feminine interests like fashion, dressing up and portraying femininity. Although this study utilised the perspectives of autistic girls as well as their mothers, there was little reported regarding the

perspectives of the girls themselves. It may also be important to consider the impact of experiences being framed in a mother-daughter dyad, which may well be thought of as typically feminine. However, it is interesting that the term "girly girl" was used by both a mother in the current study and by an adult with autism in Kanfiszer et al. (2017).

Similar to Kanfiszer et al. (2017), Bargiela et al. (2016) also interviewed fourteen women, living in the UK, who were diagnosed with autism in late adolescence or adulthood. Although the authors acknowledge that their sample may be biased towards experiences of difficulty, it none the less reflects experiences of autistic women in the general population who are frequently diagnosed much later than their male peers. Using framework analysis to explore the 'female phenotype autism' they reported upon themes regarding 'forging an identity as a woman'. Within this theme the authors describe the challenges presented by the women's perceptions of social gender stereotypes, and how at times they felt pressured or had refused to fulfil these stereotypes. The authors discuss the women's attempts to not only understand what was expected of them in terms of 'being a woman' but also their experiences of inauthenticity and a loss of self-identity when trying to fulfil these perceived identities. The authors did however report an exception, sharing the experience of one woman who rejected the validity of gender stereotypes entirely, reporting an experience outside of traditional conventions.

The papers above describe experiences of discomfort with and rejection of stereotypically feminine behaviours seen in autistic people assigned female at birth. Cooper et al. (2018) and Kraemer et al. (2005) were the only papers (irrespective of whether the person identified themselves as female or not) to report high levels of 'masculinity' as may be predicted based upon the literature. When considering these results, it is important to hold

in mind the impact of the differing methods utilised to measure and discuss 'masculinity' and 'femininity', and whether priority is given to traits which may be measured or what might be experienced. Despite these challenges, the papers selected suggest a gender experience or expression that does not fit neatly into masculine or feminine gender expressions, and in some instances may indicate a rejection of stereotypical gender expressions.

Non-conforming Gender Experiences

Eleven of the papers reviewed capture a more nuanced experience of gender, not only more complex than dyadic conceptualisations of masculinity and femininity, but also reporting experiences that are described as different, non-conforming or atypical. In the papers reviewed, some of these experiences have been conceptualised in terms of clinical perspectives of Gender Dysphoria, whilst others have taken a more social approach, considering differences across the population, or individuals own interpretations of their experience.

Prevalence of gender non-conforming experiences in Autistic assigned females.

Six quantitative papers report finding high numbers of gender non-conforming identities in autistic people, with higher variation often seen in autistic people assigned female at birth. As previously discussed, Cooper et al. (2018) not only found that autistic women reported low levels of female gender identification and gender self-esteem but also reported that the autistic women in their study were also significantly more likely to identity with a gender identity different to their birth sex when compared to autistic males. Dewinter et al. (2017) found similar high numbers of autistic assigned females reporting gender non-conforming feelings. In their case control study of 8739 adolescents and adults (675 of which self-reported autism diagnosis and 51% identified as female) they found that 22% of autistic

assigned women and 8% of autistic assigned men reported some gender non-conforming feelings. The authors queried whether their sample may have been biased due to the overrepresentation of autistic assigned females, making up 52% of the autistic group. However, these findings are in line with other studies reviewed, including research conducted by Bejerot and Eriksson (2014).

Bejerot and Eriksson (2014) also conducted a case control study comparing 103 autistic and neurotypical adults. They reported that significantly more autistic assigned females than neurotypical assigned females described an 'atypical gender identity' and identified as a 'tomboy' during childhood. Conversely, the authors also asked participants if they perceived themselves to be 'typical for their gender', finding no significant differences between autistic assigned females and neurotypical assigned female controls. The authors do however query whether this may differ in a larger sample. George and Stokes (2017) further investigated the co-occurrence of gender dysphoria and autism in their case control study of 571 adults. They used a validated measure to assess cross-gender behaviour and gender-dysphoric feelings in both autistic people and neurotypical controls. They found that autistic individuals reported a greater number of gender dysphoric symptoms than neurotypical controls. Contrary to their hypothesis, they found that assigned females did not report significantly higher levels of gender dysphoria than males. In addition to using a measure of gender dysphoria the authors also asked participants to complete the Autism Quotient- 10 (AQ-10) a validated measure of autistic traits. When comparing the AQ-10 scores with results of the gender-dysphoria measure they found significant correlations between the AQ subscales of communication skills and social skills and gender-dysphoric symptoms. The authors propose that challenges with communication and social skills frequently experienced by those with autism may contribute in some way towards the development of gender-dysphoric feelings.

Kristensen and Broome (2015) and Walsh et al. (2018) investigated levels of autistic traits in gender non-conforming adults. Kristensen and Broome (2015) used the AQ-10 to measure autistic traits in a sample of 446 self-selecting gender variant adults. Although the study is limited by the use of snowball sampling, and therefore may represent a biased sample, the authors found high numbers of people with a diagnosis of autism within the gender variant sample (23 times greater than what is seen in the general population). They also described that 30% of individuals who did not report an autism diagnosis demonstrated a level of autistic traits that would suggest a diagnosis of autism may be appropriate. In terms of gender identity, it was found that those who self-defined as 'gender-queer' demonstrated the highest levels of autistic traits as measured on the AQ-10. The authors queried the overrepresentation of non-binary identities within their sample and considered whether a tendency towards systemisation may make it more difficult to accept the imperfect binary model of gender. They suggest that when faced with a concept of gender that is continually under review according to societal perceptions, rigid binary rules of behaviour and being may not necessarily fit, and therefore prompt a person to seek alternative models of viewing gender. Similar findings were reported by Walsh et al. (2018), who measured autistic traits within 669 autistic adults who did and did not identify with their assigned sex. Consistent with previous studies, the authors found high rates of 'Trans' and 'Non-binary' identities in their sample, although due to the self-selecting sampling methods this may have also been affected by selection bias. Similar to previously reported findings the authors also found an elevation of cognitive autistic traits in the 'trans' and 'non-binary' groups when compared to the 'cisgendered' group. Walsh et al. (2018) also considered their results as support for the hypotheses of an 'autistic resistance' to social conditioning and a rejection of binary cisgendered norms. Unlike, Kristensen and Broome's (2015) theories of systemisation, Walsh et al. (2018) consider their results within Bayesian models of cognition which propose

that learned patterns (e.g. social norms) from the past are less significant for autistic people than present experiences. The authors hypothesise that the relationship between autism and gender non-conformity may be better understood as gender non-conformity being supressed by social norms in neurotypical individuals.

Experiences of gender non-conforming in autistic assigned females.

The papers discussed above demonstrate that when asked to tick a box to select which gender you best fit with, autistic people assigned female at birth show greater variance than is seen in the general population. However, this tells us little about individuals' experiences of what 'gender non-conforming' looks like nor how it is experienced.

Qualitative papers which explored the experiences of autistic women who identify as female (Bargiela et al. 2016; Cridland et al. 2014; & Kanfiszer et al.2017) reported upon themes of feeling different from female peers, being faced with androcentric autistic support services and experiences of abuse and victimisation. Fitting in with female peers and navigating female friendships was discussed in a number of the papers, both Bargiela et al. (2016) and Cridland et al. (2014) describe participants' attempts to 'be normal' and 'portray femininity' due to fears that non-conforming would lead to bullying and ostracism. The papers share how these fears and challenges in understanding the social expectations of female friendships often lead to individuals feeling more comfortable in the company of male peers. Cridland et al. (2014) discussed experiences of "being a girl in a boys' world" when facing additional adversities of autism services that do not cater for girls. Whilst Kuvalanka et al. (2018) and Strang et al. (2018) highlight the culmination of adversities from a neurotypical and cisgendered world in which many feel that both their autistic and gender concerns are not taken seriously.

Both Kanfiszer et al. (2017) and Cridland et al. (2015) reported upon the experiences of bullying shared by the girls and women they interviewed, one example quoted was from a women who was left to feel as though "people didn't want to know me". The women in Kanfiszer et al. (2017) also shared experiences of victimisation ranging from alienation, verbal, physical and emotional abuse as well as sexual victimisation. Bargiela et al. (2016) also commented upon themes of victimisation raised by the women they interviewed but themed these experiences as "passive to assertive". The authors explain how the women made sense of their passivity through their autism, describing how the need to please in order to feel accepted often led to unhealthy relationships and high-risk situations, with a shockingly high incidence of sexual abuse reported by the participants (9 out of 14). Despite these adversities, the authors also discussed how a number of the young women reflected upon learning from these difficult experiences, sharing how they felt as though they had become more assertive over time. Strang et al. (2018) also reported upon the reflections of some individuals who felt that their co-occurring gender-diversity and autism could be helpful, describing a comfort with non-binary expressions as well as being part of a community.

It is clear that for many autistic assigned females there are a range of experiences that may contribute to feelings of difference, not fitting in or not conforming to what society may expect, in terms of both gendered and neurotypical expectations. For some people these feelings are painful or distressing, but as Walsh et al. (2018) suggested there is also evidence that for some these social norms and expectations are not so much of a concern and therefore autistic traits may have a protective function.

Gender Blind/Gender Neutral

Several papers included in the review not only spoke of an experience of gender that is different from the norm, but also report experiences of not connecting with concepts of gender, rejecting gender constructions entirely, or just simply not being bothered by ideas around gender. Many of the papers consider these approaches not only in terms of relating towards oneself, but also in perceptions of others and relationships.

Three of the studies included in the review (Bejerot & Eriksson, 2014; Dewinter et al. 2017 & George & Stokes, 2018) included measures of sexual orientation within their analyses due to higher reported levels of non-heterosexual orientation in autistic people. Dewinter et al. (2017) found that compared with neurotypical controls, both autistic men and women reported greater sexual diversity, with a greater number of women reporting sexual attraction to both men and women. In contrast, a notable number of participants reported no sexual attraction to either gender. In the study conducted by Bejerot and Eriksson (2014), homosexuality was equally common between autistic individual and neurotypical controls, but bisexuality was reported significantly more frequently by autistic women. The authors consider whether this overrepresentation of bisexuality might reflect rejection or increased independence from social norms both in terms of gender and relationships, as proposed by a number of papers previously discussed.

An alternative explanation for the increased levels of gender variance and non-heterosexual orientations in autistic people presented in these papers is ‘gender blindness’. Bejerot and Erikson (2014) describe this as an appraisal of oneself and others based upon qualities rather than specific gender traits, thus contributing to perceptions in which gender is less important. Although ‘gender blindness’ and independence from social norms are presented as differing explanations, it may be more useful to consider how they may interact. George and Stokes (2018) also sought to investigate links between autistic traits, gender and

sexual orientation, including a question upon whether or not the gender of a partner was unimportant. Unfortunately, the authors do not present data regarding number of heterosexual/non-heterosexual orientations in the autism group in comparison to the non-autistic group. However, they reported findings that autistic individuals demonstrated greater gender-fluid attitudes and a "nonchalance" towards the gender of their romantic or sexual partner, supporting the theory that both gender and social norms may be less of a concern for autistic people.

George and Stokes (2018) also reported support for their hypothesis that gender-dysphoric traits partially mediated the relationship between autistic traits and sexual orientation. It may also be of note that they also reported that levels of gender dysphoric traits were significantly higher in non-heterosexual individuals (irrespective of autism diagnosis) when compared to heterosexual individuals. This finding may raise questions as to the validity of the gender-identity/dysphoria measure and what it may actually be measuring, or on the other hand may be reflective of greater gender variability in non-heterosexual individuals, or potentially greater independence from social norms.

Overall Critique

A number of methodological considerations of the papers reviewed are discussed below. Critiques by method used are presented first, followed by general critiques applicable to many of the papers included. Tables provided in Appendices A – D provide further assessment of papers quality reviewed in line with method specific criteria.

Qualitative studies

Six qualitative studies were included in the review (Bargiela et al., 2016; Cridland et al., 2014; Kanfiszer et al., 2017; Kuvanlanka et al., 2018; & Strang et al., 2018) including one case report (Kraemer et al. 2005). Guidelines adapted from Elliot, Fischer and Rennie (1999) were used to aid analysis of the quality of the qualitative papers (Appendix A), and guidelines from the JBI critical appraisal checklist for case reports (2017) were used to aid consideration of the quality of the case report (see Appendix B).

Findings reported in the papers above should be considered with potential limited generalisability in mind. The small sample sizes are appropriate to the approaches utilised and are valuable in a topic area in which little literature exists (Roth & Fonagy, 2006). A great strength of these studies is the in-depth data they gathered regarding individuals' experiences, which are often presented and interpreted with the aim to privilege the individual's experiences. All studies with the exception of Kraemer et al. (2005) utilised credibility checks within their analysis in order to minimise potential researcher bias. Strang et al. (2018) provided a particularly thorough and detailed description of the process of analysis, situating the analysts and including the input of stakeholders.

Although the papers utilised checks to strengthen their analysis, they did little to situate themselves in terms of research assumptions, orientations or connection with the topic or participants. This may have aided the reader to make greater sense of the structure of interviews, how researchers may have been experienced and the emerging themes.

Cross-sectional studies

Two papers utilised cross-sectional methods (Kristensen & Broome, 2015 & Walsh et al., 2018). The JBI critical appraisal checklist for cross-sectional studies (2017) was utilised to aid assessment of the papers' methodological quality, see Appendix C.

Both papers comment upon the non-typical samples seen in their studies. Whilst Kristensen and Broome (2015) took steps to avoid community bias in their snowball sampling, Walsh et al. (2018) attempted to readdress the bias using statistical resampling. Selection bias is highly likely in both studies; although the papers make attempts to balance this neither consider why their studies attracted non-typical samples.

Case Control Studies

Five papers included in the review utilised case control methodology, each comparing an 'autism' group to 'non-autistic' controls (Bejerot & Erikson, 2014; Cooper et al., 2018; Dewinter et al., 2017; George & Stokes, 2018 & Stauder et al., 2011). Guidelines for the appraisal of case control studies provided by the JBI (2017) were utilised to aid critique of methodological quality, see Appendix D.

A common challenge in case control studies is ensuring that individuals in both groups are comparable and appropriately matched. Bejerot & Erikson (2014), Dewinter et al. (2017) and Stauder et al. (2011) reported matching participants based upon age and gender, whilst no such matching process was discussed in the other two papers. Good comparability of samples was reported by all papers, with the exception of Dewinter et al. (2017) reporting that there was a significantly higher proportion of controls with lower levels of education than compared with the autistic group. Although, good comparability was reported by all studies, it is questionable whether or not the recruitment procedures would have been likely to similarly comparable groups, with autism groups often being recruited via a clinical

setting. Therefore, these studies may miss out on the experiences of autistic individuals who are not in contact with clinical services. In addition to the potential differences between the groups, the self-selecting nature of survey design used by the studies may further bias findings due to the increased likelihood of those who have an interest in gender completing the survey.

An additional critique of Cooper et al. (2018) and Dewinter et al. (2017) was that the two groups were subject to differing procedures. In Cooper et al. (2018) the autism group were required to complete additional questions, whilst in Dewinter et al. (2017) the results were taken from different surveys entirely.

General critiques

Clinical problem versus social account

When defining the limits and conceptual challenges of this review it was noted that the papers included utilised a range of criteria in order to define the 'autistic sample' and to discuss and explore gender. There may be strengths of using diagnostic criteria to define autism or GD, which may aid the replicability of research. However, this can lead to homogenous samples that neglect a range of experiences that sit outside a clinical frame.

Non – typical sample populations

Many of the studies reviewed made explicit reference to evidence that the sample used would differ from what might be expected to be seen in the general population. Several of the papers noted that their samples included higher numbers of individuals with autism with an above average IQ, or university education that may be seen in the general population. This bias may represent those are who are better able to access the research but may also have more invested interest in the research. Kanfiszer et al. (2017) was the only paper to actively support people with varying levels of abilities to access the research, two of the papers excluded

people with intellectual disabilities and many of the papers did not make their inclusion and exclusion criteria explicit. This leads to uncertainty when comparing the studies and assessing the papers generalisability.

Discussion

The findings from this review will be discussed considering the wider context and implications for clinicians, including the clinical psychology profession. Consideration will also be given to gaps in the literature and opportunities and suggestions for future research.

Overview of Findings

The current review aimed to explore, synthesise and critique what current literature tells us about the experience of gender for assigned females with autism.

Although some papers sought to measure gender expression in terms of typical representations of masculinity and femininity, a gender non-conforming experience was more commonly reported when looking across all the papers reviewed. However, this theme was presented and discussed in a variety of ways and may demonstrate how wide-ranging experiences of gender are. The commonality of experiences of difference, abuse and victimisation were shocking, and it is important to consider the potential impact these may have on gender development and how an individual adapts in a largely binary gendered neurotypical world.

It seemed that there was a range of approaches shared in terms of how individuals make sense of and respond to these differences, with some rejecting constructs of gender altogether and others showing disinterest or a gender blindness similar to that presented by Meyerding (2003). A number of theories were presented to help explain these different approaches, including finding places of ‘best fit’, independence from social norms, attempts

to systemise an imperfect and continually changing construct of gender, and a permission to be different because they are 'atypical' cognitively, therefore they are more able to be atypical in terms of gender too.

Limitations

It is surprising to note how little literature was found within the search conducted for this review, with only thirteen papers in total found. The number of papers which were excluded due to their focus on the experiences of assigned males or on diagnostic differences between the genders goes to show how neglected the experiences of autistic women assigned female at birth have been.

None of the theories included seem to capture the full range of experiences described. Although beyond the confines of this review, it would be interesting to further consider the construct of autism and to consider whether the experiences of autistic assigned females are a magnification of other themes currently occurring across the general population in terms of how we view difference and particularly how we view gender.

Implications for clinical practice

It is clear from this review that the different ways in which autistic assigned females experience gender should be held in mind. Attention needs to be given to androcentric practices and support services for autistic people, and the impact this may have on autistic women.

Whether gender is experienced as dysphoric or not, it is evident that being open to discussions that take individuals' experiences and perceptions seriously are important in order to fully consider and understand the challenges they may face from the neurotypical, cisgendered world.

Future research

The current review demonstrates the continuation of androcentric circular practices in the study of autism, and the great need for more research exploring the experiences of autistic assigned females. Drastic changes are being experienced by gender identity services (Kaltiala-Heina, Sumia, Tyolajarvi & Lindberg, 2015; Skagerberg, Di Ceglie & Carmichael, 2015) in terms of the high number of autistic assigned females attending their services. Furthermore, with research suggesting the great variation experienced by autistic women, research needs to catch up to further investigate these co-occurrences.

Further qualitative research looking into the perspectives and experiences of autistic assigned females attending these services, as well as the experiences of those who do not attend services, will be important to further our understanding of this common co-occurrence.

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Section B

Exploring puberty in gender diverse youth: Experiences of assigned females.

Word count: 7991

Abstract

Background

Gender Identity Development services have not only experienced a significant increase in referrals over the past ten years, but they have also seen increasing numbers of young people assigned female at birth being referred. Little is known about the experiences of these young people, nor possible reasons behind the change in referrals. Literature highlighted intolerance of uncertainty and knowledge regarding puberty as potential areas of investigation.

Aims

The current study aimed to explore the experiences and expectations of puberty for gender diverse young people, assigned female at birth, aged between nine and 14. Levels of intolerance of uncertainty, pubertal knowledge and where they get their information about puberty from was also measured.

Methods

A hermeneutic, embedded multiple case study design was used. Five young people took part in a semi-structured interview including a dyadic personal construct elicitation task to explore experiences of puberty and questionnaires of intolerance of uncertainty and pubertal knowledge. Thematic analysis was carried out to analyse themes within and between cases.

Results

Themes of ‘conflict’, ‘pain and discomfort’ and ‘difference and fitting in’ were seen when comparing cases. Levels of intolerance of uncertainty and pubertal knowledge were valuable when considering individuals’ experiences and expectations of puberty and how these interacted with their gender identity and plans for physical intervention.

Discussion

Themes of conflict regarding puberty may be considered as an interaction between common assigned male perceptions of puberty (such as excitement) in combination with experiences of pain and demasculinisation. Feelings of difference and attempts to fit socially constructed views of ‘masculinity’ and ‘femininity’ often limited individual’s opportunities for exploration. Limitations and recommendation for future research, clinicians and education are reported.

Key words: Puberty, Gender diverse, Female

Introduction

The last decade has seen dramatic changes in awareness and attitudes towards gender diversity. Changes have not only been seen in the media and public domains but also at the level of services. Child and adolescent Gender Identity Development Services (GIDS) in the UK and around the world have reported an increase in referrals of young people seeking support with incongruence between their experienced gender identity and the gender they were assigned at birth (Aitken et al. 2015; de Graaf, Giovanardi, Zitz & Carmichael. 2018 & Wood et al., 2013). Not only have these services seen a significant increase across all referrals, but they have also reported an increasing number of young people assigned female at birth (AFAB) being referred. The UK's GIDS reported that in 2009 two thirds of their referrals were for young people assigned male at birth (AMAB), whilst in 2016 just over two thirds of the referrals were for young people AFAB (de Graaf et al. 2018).

Aitken et al. (2015) considered the impact of media and digitalisation on the visibility and destigmatisation of transgender identities, and how this may have contributed to increasing referrals. They acknowledge however that although young assigned females and assigned males may use digital media differently from one another, this cannot fully account for the greater number of young people AFAB accessing services. The authors also considered the impact of earlier pubertal development of young people AFAB as well as societal acceptability of differing sexual and gendered identities. De Graaf et al. (2018) question the impact of socially constructed views of 'femininity' and 'masculinity', especially for those who feel that they do not fit these stereotypes. They also considered the trend of increasing psychopathology in adolescent young people AFAB and questioned whether they may be increasingly more worried about the thought of puberty.

Table 1.

Glossary of terms

Term	Definition
AFAB	Assigned female at birth
AMAB	Assigned male at birth
FtM	Female to Male: a person assigned female at birth who identifies as male.
Non-binary	A person who does not identify as male or female
Gender diverse/variance	Identifying with a gender other than what was assigned at birth
Gender identity	An individual's internal sense of their gender
Gender expression	The ways in which an individual expresses their gender
'T'	Testosterone
Top surgery	Surgical procedures on the breasts
Bottom surgery	Surgical procedure on the genitals

In addition to the observed shifts in assigned gender of referrals to gender services, there have also been increasing accounts in the literature reporting upon co-occurrence of gender dysphoria or variance in those with autistic traits or diagnoses of autism. Strang et al. (2014) reported that children with autism were 7.59 times more likely to express gender variance in comparison to 'typically developing controls' in their study conducted in the US. Similar rates of co-occurrence have been reported in the UK by Skagerberg, Di Ceglie & Carmichael (2015) who found that 54% of a sample of young people presenting with gender dysphoria displayed autistic traits. De Vries et al. (2010) also found an incidence of autism in 7.8% of a sample of children referred to a gender identity clinic in the Netherlands. These co-occurrence rates are significant when considering the reported prevalence of autism in the

general population at 0.6% (Fombonne (2005) and estimated rates of experienced gender dysphoria at 0.6% for AMAB and 0.2% for AFAB (Kuyper & Wijsen, 2014). Research looking to explore and explain the co-occurrence between autistic traits and gender diversity has offered a range of theories. Biological approaches have suggested that elevated levels of foetal testosterone, and continuing elevation of androgen levels may contribute to autistic traits in people AFAB and to gender dysphoria (Jones et al., 2012).

Other investigators have considered whether gender variance can be understood as a feature of autism. Perhaps being seen as an 'obsessional feature' or 'special interest' (Landen & Ramussen, 1997; Vanderlaan et al, 2015), as a result of rigid interpretation of gender roles (Strang et al. 2014) or as a consequence of differences in social and communication skills which may promote the expression of non-typical gender behaviours (Glidden et al. 2016) or lower gender identification (Cooper, Smith & Russell, 2018).

For many, with or without autism, gender diverse or not, puberty can be a challenging time. It is a time marked by a child's physical, cognitive and social development into an adult. In addition to physical changes bringing about sexual maturity, it is thought that development of the prefrontal cortex of the brain allows for improved executive functioning and greater abstract thought (Yurgelun-Todd, D, 2007). Theories of identity development are also vital to consider when thinking about adolescence and the dramatic changes that are experienced. Early theories characterised adolescence as a time of internal turmoil, representing a shift from being primitive to civilised (Stanley Hall, 1904). Erikson and Erikson (1998). furthered these ideas, focussing on the re-examination of identity during adolescence, where young people search for independence whilst also seek belonging amongst peers. On the other hand social constructivist theorists have discussed the impact of

societal expectation in determining not only the time and duration of adolescence but also what is valued (Harter, 1999). These values are particularly important when thinking about the development of sexuality and gender. During this time development may consist of typically 'masculinising' or 'feminising' changes within one's body, changes in social environments, in gender related societal expectations and often the first feelings of love or sexual attraction (Steensma, Biemond, Boer & Cohen-kettenis, 2010). Although puberty can be a challenging time for all, literature suggests that this period of development presents additional challenges for young women (Mendle, Harden, Brooks-Gunn & Graber, 2010) for those with autism (Erikson, 2016) and those who are questioning their gender (de Graaf et al., 2017). In addition, bodily changes can be particularly distressing for gender variant young people who may experience time pressures to make decisions about whether or not to take hormone blockers and how this may affect their future body, gender and life (Roen, 2016).

Models of intolerance of uncertainty have previously been used to aid understanding of childhood anxiety (Wright, Adams Lebell & Carleton, 2016) and recently anxiety in people with autism (Boulter, Freeston, South & Rodgers. 2013). These models may hold additional value in better understanding the experiences and expectations of pre-pubertal young people, in particular the experiences of gender diverse youth who may experience greater levels of uncertainty regarding their future. In addition to uncertainty regarding the future, evidence suggests that knowledge of pubertal changes varies greatly across individuals, and therefore lack of information regarding puberty may lead to greater uncertainty and amplify the distress experienced (Koller, 2000). Therefore, it is suggested that a greater understanding of pubertal knowledge is vital when measuring levels of intolerance of uncertainty in pre-pubertal young people.

Currently there is sparse literature exploring the experience of puberty for gender diverse people AFAB. Considering the increase in referrals to GIDS, in addition to the indicated anxiety and stress experienced by AFAB approaching puberty, this is an area which requires better understanding. The current study aims to explore the expectations and experiences that young people, AFAB hold towards puberty. Due to the indicated impact of Intolerance of uncertainty in adolescent anxiety and suggested variability in young peoples' knowledge of puberty these ere felt important to consider in order to gain a comprehensive understanding of this area. The current aims for the study are therefore to explore:

1. The expectations and experiences of puberty for gender diverse young people AFAB.

2. The levels of intolerance of uncertainty experienced by gender diverse young people AFAB.

3. The level of understanding regarding pubertal changes held by people gender diverse young people who are AFAB.

4. Where do gender diverse young people AFAB get their information regarding puberty from?

Method

Participants

Inclusion criteria

Gender diverse young people, AFAB, aged between nine and 14 were invited to take part in the study. This age range was chosen to encompass a crucial period in terms of both pubertal and gender identity development (Steensma, Biemond, Boer & Cohen-kettenis. 2010). All

participants were open to a GIDS at the time of interview and were required to have attended at least one assessment appointment in order to allow for the young person's clinician to consider whether or not engagement with the research was appropriate.

Participants were required to be fluent in English with adequate verbal communication skills to be able to engage in the discussion-based activities of the interview. Participants with a diagnosis of autism or social communication difficulties were included. The presence of social communication difficulties, measured by the Social Responsiveness Scale–Second Edition (SRS-2) (Constantino & Gruber, 2012) is often used to indicate potential autistic traits.

Exclusion criteria

There were no formal exclusion criteria used, but clinicians were asked to consider the potential practical and emotional impact the study could have on the participant as well as their family.

Participants recruited

The specialist nature of the research meant that there was a relatively limited population to recruit from, furthermore, there were small numbers of individuals that met the inclusion criteria. Therefore, an opportunity sample of five young people were interviewed. This sample was deemed sufficient in line with approaches where large cohort and longitudinal studies are unfeasible (Roth & Fonagy, 2006), from guidance studies utilising a hermeneutic approach (Wall, Kwee, Hu & McDonald. 2016) and from precedents set by studies researching a similar population (Kuvalanka, Mahan, McGuire & Hoffman. 2018).

Design

A hermeneutic, embeded multiple case study design was used. Yin (2014) described the advantages of using mixed methods (an 'embedded' approach) with multiple case studies in order to collect a richer and stronger array of data than could be allowed by single case or single method approaches. The collection of both qualitative and quantitative data via semi-structured for an in-depth examination of participants' own experience in addition to allowing cross case comparisons and comparisons with population norms. A hermeneutic approach as described in Wall, Kwee, Hu and McDonald (2016) was utilised to further inform the approach that was taken to the interpretation of the data collected. Due to the sparsity of research within the topic this approach was selected in order to maximise the information that could be gained from a limited and hard to reach population. Hermeneutics is an interpretive approach which places focus on how people understand and construct the world around them. This approach was therefore valuable to allow for a sensitive and thoughtful approach to the rich data set, privileging the young peoples' experiences and perceptions of their world. This is especially important considering the sensitivity of the study's aims to explore experiences and expectations of puberty, which can be difficult to speak about for all, and potentially even more so for gender diverse youth. The interview was therefore designed with the aim of gaining both a depth and breadth of information about how people AFAB attending GIDS experience and perceive puberty. Previous literature guided potential areas of investigation, including levels of intolerance of uncertainty and knowledge of puberty.

Measures

Experiences and perception of Puberty

Since there is little existing literature describing the experiences and perceptions that gender diverse young people have towards puberty an open and flexible approach to collecting data

to explore this research aim was required. Therefore, a structured interview using a dyadic personal construct elicitation task was utilised to explore individual's experiences and expectations of puberty. This exercise was developed from techniques and exercises used in personal construct theory (Fransella, 2005; Kelly, 1995; Winter, 2003). This constructivist approach to making sense of individuals' thought and action was considered appropriate for the current study not only because it privileges an individual's experience, but it also considers the impact and interpretations of the 'other' or in this case the researcher. Personal construct techniques have been widely utilised with children and within the autistic population due to the technique's benefits in scaffolding and focusing conversation (Cridland et al. 2016; Murphy, Burns, Kilbey, 2017).

Within the current study participants were asked to name what they think are the five biggest changes that occur in puberty. For each 'big change' the young person was asked various questions to gain a rich description of how they perceived this change. An opposite of this 'big change' was elicited and the same procedure followed. The young person was finally asked where they feel they are now in relation to the corresponding constructs and where they would like to be. This exercise was hoped to aid the process of exploring the individuals understanding and concerns about the potentially difficult topic of puberty. Although not all participants who were recruited in the current research were known to experience social communication difficulties, the interview was designed in order to meet these needs due to the high number of gender variant people AFAB who experience these difficulties (Skagerberg et al. 2015).

Intolerance of uncertainty

Intolerance of uncertainty was considered an important construct to measure due to the many changes, and potential for uncertainty, experienced during puberty. Intolerance of uncertainty have been shown to mediate the relationship between autism and clinical levels of anxiety (Boulter et al. 2014) and therefore may be helpful in understanding the higher levels of anxiety experienced by adolescents and in particular gender variant young people (Kristensen & Broome. 2015; Mendle, Harden, Brooks-Gunn & Graber. 2010).

A 12-item questionnaire examining levels of intolerance of uncertainty was chosen (Walker, 2009). This measure, adapted from Freeston et al. (1994), required participants to rate, on a five point Likert scale, the extent to which statements relating to uncertainty were representative of them. This version of the measure was selected for the current study as it has been used and tested with young people with a diagnosis of autism. The measure has been reported to show acceptable internal consistency and convergent validity (Boulter et al. 2014; Walker, 2009), with similar versions demonstrating good test-retest reliability (Freeston et al., 1994). This data will be compared with reported means in the literature as well as considered in terms of how it may help us better understand the individual's experience of puberty. The maximum score on the Intolerance of Uncertainty Scale (IUS) is 60. Previous research by Boulter (2014) using the same Intolerance of Uncertainty Scale in young people aged eight to 18 found an average score of 34 in young people with Autism and 28 those without autism.

Puberty Knowledge

Little is currently known regarding the levels of understanding that gender variant young people hold about puberty. This knowledge is not only important to feel comfortable,

confident and safe but is also crucial to many of the decisions that may be considered if a person chooses to start hormone blockers or cross hormone treatment. Therefore, a measure of pubertal knowledge was considered valuable in the current study.

The puberty knowledge questionnaire used in the current study was adapted from Hurwitz et al. (2016). The measure was selected due to its use with children aged 7 – 12 years of age, the reported consideration taken during the creation to respond to children's sensitivity around the subject. It was also considered to fit with UK educational guidelines (UNESCO, 2009; National curriculum, 2013). The questionnaire also asks the young people where they learnt about puberty. The maximum score possible on the puberty knowledge quiz was 24. Since the puberty measure has not been scored in previous literature, comparisons have been made with descriptive results reported in Hurwitz et al. (2017).

Procedure

Participants were identified via a UK GIDS. Clinicians within the service were informed about the research and requested to discuss the study with individuals and the parent/ guardian of individuals who met the inclusion criteria. Clinicians and researchers sent out research information packs to potential participants. A time was arranged for the participant and their parent/guardian to further discuss the study with the researcher. If the participant and their parent/guardian requested to take part in the research a time was arranged to meet for the interview. All interviews were conducted at participans' homes. The option was given to conduct the interview at the GIDS, at home or in a preferred location.

At the start of all interviews the researcher met with the participants and their parent/guardian jointly in to introduce themselves, to discuss what was involved in the

interview and to discuss participant assent and parental consent. Participants were asked whether they wished their parent/guardian to be present during the interview. Interviews lasted between 90 - 120 minutes and took place between August 2018 and February 2019.

After informed consent and assent was clarified (see Appendices J and K) the interview began with an ice breaker task. This task required the young person to select ten positive describing words or adjectives and assign them to four important people or animals in their life. This offered an opportunity to build rapport and gather background information regarding the participant's relationships. Further background information was collected regarding the young person's gender identity and hopes in terms of GIDS intervention.

Participants next completed the dyadic elicitation task in which they were asked to think about, in their opinion, what the five biggest changes are that happen in puberty. Participants were offered a break before completing the Intolerance of Uncertainty scale and Puberty Knowledge Questionnaire. This order was chosen so as to avoid potential conflicts or priming between tasks. Before ending the interview, the researcher asked whether the participants wanted to add anything to the previous tasks. The participants were then thanked for their time and effort. All participants were given a £10 voucher in thanks for their participation the study.

As soon as possible after the interview the researcher recorded any initial impressions and reflections in order that these be considered during analysis.

Ethical considerations

Ethical approval was obtained from an NHS Research Ethics Committee (Appendices E and F) and research governance approval was obtained from an NHS trust research and development department (Appendix G). The British Psychological Society Code of Conduct (BPS, 2009) was followed.

The suitability of Information sheets, assent and consent forms and an initial interview schedule were discussed and adjusted in line with feedback provided by young people who have attended GIDS.

Due to the sensitive and potentially distressing nature of discussing puberty and gender, attention was given to clearly state the main aims and topics of the study in both the information sheet (Appendix H and I) and in pre-interview discussions. Throughout interviews the researcher was also attentive to the participant's mood and signs of distress. All participants were informed that should any risk concerns arise during the interviews that the researcher may share this information with their clinician from GIDS to ensure their safety.

Data Analysis

Following guidance from Yin (2014) and Braun and Clarke (2006), data was analysed firstly within each case and then convergence was considered between cases. The researcher became familiarised with the data, coded initial themes, defined and reviewed these themes prior to producing the report.

Quality assurance

To ensure the quality of the current study guidance was taken from Yardley's (2000) principles for quality in qualitative research. Yardley discussed four key principles which the research was guided by; commitment and rigour, sensitivity to context, transparency and coherence as well as impact and importance. Inter and Intra triangulation was created using multiple types of data and by comparing the cases to strengthen conclusions made.

Due to the hermeneutic approach utilised it was important for the researcher to be aware of their own position throughout the research process. Bracketing interviews and a research diary (extracts in Appendix O) were used to support reflection upon the researcher's position and potential biases (Tufford & Newman, 2010).

To ensure reliability of scoring, two Puberty Knowledge Quizzes were re-scored by a colleague independent to the research. The same scores were provided for each case. Two colleagues independent of the research (one involved in GIDS research, another with no previous GIDS connection) were asked to check a sample of the coding for coherence between quotes and themes and to draw attention to any potential bias. Both reviewers agreed that themes reflected the data well.

Researcher positioning

At the start of each interview the researcher introduced themselves, using their preferred pronouns (she/her). The researcher was in her late twenties and presented in what might be considered gender neutral, smart casual clothes for each interview.

The researcher holds a position towards research and gender that may be best described as critical realist, seeing gender as something that exists but our interpretation of it

is personally and socially constructed. Viewing gender as a complex construct, greater than a biological based binary label may have influenced the analysis.

Results

Each case has been presented with comment upon background information, gender development and hopes for the futures. Data from each interview task is outlined and contrasted with other participants and previous findings. Convergence of data is considered for each person in a case summary, followed by a case comparison and synthesis. No real names are used, each participant chose a pseudonym. See Table 2 below for a summary of the cases.

Table 2

Case Data Overview

Name	Age	Intolerance of Uncertainty Scale[a]	Puberty Knowledge quiz score[b]
Jordan	14	38	17
Aaron	14	29	22
Jay	14	33	22
Rian	12	16	14
Alex	13	54	N/A

Note. N/A indicates where the participant requested not to complete the Puberty Quiz.

[a] Boulter (2014) found an average score of 28 on the Intolerance of Uncertainty Scale in children aged eight – 18.

[b] The maximum Puberty Knowledge quiz score is 24, there are no norms for this measure.

Case Series

Jordan.

Background information.

Jordan uses he/him pronouns and identifies as 'male' and is 14 years of age. He lives with his parents, brothers, dogs and cat in the south of England. He is a dog and animal lover, and hopes to work with wild animals when he is older. At point of recommendation to participate in the research, it was reported that Jordan showed some social communication problems as measured by the Social Communication Responsiveness scale (Constantino & Gruber, 2012). Jordan requested that his mother remain in the room throughout the research interview.

Gender development and hopes for the future.

Jordan shared that he first attended specialist GIDS in 2016 and has attended approximately 10 appointments. He said that he is hoping to start hormone blockers soon.

Puberty experiences and expectations.

When asked about changes in puberty Jordan named 'getting taller', 'body parts growing', 'hair everywhere', 'voice changing' and 'looking different from younger'.

Conflict.

When talking about changes Jordan shared a sense of conflict in terms of wanting to "grow up" and grow in some ways but not others, e.g. wanting to grow taller, get bigger hands and feet but not wanting breasts to grow.

"well…I don't like the first one… [points to chest]….these growing, but I don't mind my hands growing, my feet growing and that, it's just these…"

Jordan also spoke about mixed feelings due to growth being a reminder of his female body, *"it just puts me down because it just reminds me of like…my body right now".*

Embarrassment and difference.

When talking about body hair and voice changes Jordan shared his appreciation of hair and a lower voice, reporting that he currently has more hair and a lower voice than many of his assigned female peers. Jordan spoke about how embarrassing it would be if this was not the case.

"if you had a high voice and you wanted it to go a bit lower, or something it would, you'd be devastated because it would just…yer…it would just be annoying because everyone's voice would be changing and yours would be staying the same"

Feeling questioned.

When talking about his interests, Jordan spoke about being questioned by others for choosing to study Beauty at school because it is often deemed a 'female subject'. Jordan spoke about doing it because he enjoys it.

IUS and Puberty knowledge.

Jordan scored 38 on the IUS, above both means reported for young people with and without autism. He scored 17 on the puberty knowledge quiz, lower than his same age peers in this sample, but higher than the score achieved by Rian, who is younger. Jordan gave more detailed answers for questions asking about assigned female development in comparison to questions regarding assigned male development. Jordan said that he learnt what he knew from sex education at school and from his cousins.

Case summary

Jordan acknowledged that the topics discussed in the interview were not things that he often spoke about. Jordan's high score on the intolerance of uncertainty scale, considered in combination with his theme of 'conflict' may suggest apprehension regarding further pubertal changes and how hormone blockers or further physical interventions may affect this.

Although Jordan has not started any physical interventions as yet, he spoke about many of his physical attributes (hair and voice) as being more in line with assigned male peers, than assigned females. These attributes may have contributed to feelings of difference prior to social transition but are perhaps now experienced as more in line with gendered expectations.

Aaron.

Background information.

Aaron described his gender identity as "masculine" and uses he/him pronouns. He is a keen and dedicated student of Taekwondo, enjoys video games and watching Youtube. Aaron is 14 years of age, he is an only child, living with his parents and pets in a town in central England. Aaron chose to be interviewed alone.

Gender development and hopes for the future.

Aaron described that he had always been taller than his female peers, and would often take the 'male' role in imaginary play. He said that *"I was never the princess, I was never the damsel in distress, I was always the bad ass ninja".* Aaron said that he started to feel unsure about his gender when he was about 10 years old, at a time in which he described that he was also exploring his sexuality. Aaron described a period of wanting to "fit in" in year 7, trying

to be female and feminine, but feeling that this was *"fake".* Aaron "*came out as trans*" aged 12 and shared that he is attracted to boys and girls.

Aaron first attended specialist gender identity development services about six months ago and has attended six appointments. He is hoping to start blockers in the next year, to then move onto testosterone, and have top surgery in the future.

Puberty experiences and expectations.

Aaron named the "first time bleeding", "growing pains" and "extreme periods" as the biggest changes in puberty. Aaron spoke about being one of the first assigned females in his year to start their period.

Pain and discomfort.

Aaron described that his experience of periods was further complicated by experiencing what we termed as 'extreme periods', in which he experienced a number of painful and alarming side effects, Aaron described how on one occasion *"It was like my body saw my period as an actual virus and was trying to purge myself, I felt so so bad and it was like I had food poisoning".*

Conflicted and alone.

Aaron shared conflicting feelings in terms of his periods. Feeling that they were very natural, sometimes feeling excited and proud, but also describing them as very challenging at a time in which he was feeling more masculine. *"so yer, I was a little bit proud of it, almost, and then obviously I got home and was like that makes me even more female, and you know that was a little bit downing".*

In addition to menstruation itself feeling de-masculinising, Aaron also spoke about how self-care whilst on his period also felt conflicting due to feeling that this behaviour might be seen as *"stereotypically feminine".* Aaron shared how these feelings contributed to him initially neglecting his own self-care and *"blocking out"* the experience. Aaron described how in some ways his 'extreme periods' were less *"stereotypically feminine"* because they would be atypical and distressing for any assigned female. Aaron also described feeling alone and "*isolated*", experiencing pubertal changes before his peers *"it was very…alarming, it was scary because I didn't have anyone to talk to about it at school because none of my friends had gotten it".*

Difference, exploration and fitting in.

During our discussions, Aaron spoke of his experience of *"questioning, researching, experimenting"*, exploring his identity, sexuality and gender, *"it was a huge period of time of self-discovery and obviously this whole thing was happening with me being bisexual, which was nothing normal, or nothing odd…no nothing average".*

He spoke about times in which he felt different from assigned female peers and tried to act "*feminine"* to fit in.

"really trying to fit in and everyone is falling into their friendships groups and everyone is kinda making their way into this school and I was just kinda floating around, and I felt different and I was an alien".

"it was difficult and then I really tried to act feminine cos I was, I would, stereotyping yourself and I felt like the kinda butch lesbian".

He described that despite his attempts to be feminine he *"just didn't like it",* seeming to fall into categories, neither of which fit his experience.

Wanting to be grown up.

Similar to Jordan, Aaron also spoke about his desire to be older *"I've always wanted to grow up, and I've always wanted to be older than I am, I think a lot of trans guys are like that".*

'Female' interests

Like Jordan Aaron also spoke about an interest in beauty and make-up which he felt might be questioned by others who might think that it *"makes you female".*

IUS and Puberty knowledge.

Aaron scored 29 on the IUS, this is in line with the average of 28 reported for young people without autism. Aaron's score of 22 on the puberty knowledge quiz was joint top score, along with Jay. He demonstrated a thorough understanding of puberty in his answers and said that he learnt what he knew from science lessons, sex education lessons at primary school and via his own research.

Case summary.

Aaron was able to speak about topics of gender and puberty with ease and was able to reflect upon how his perceptions have changed over time. Being a tall child, playing male roles in imaginary play, experiencing period early, atypical experience of periods, non-heterosexual sexuality all created differences between him and his peers and understandably created a strong desire to fit in. Although initially describing attempts to act "feminine" which didn't fit, Aaron described appreciating opportunities to explore which may have been more

difficult if he experienced higher levels of intolerance of uncertainty, or was not so well informed about puberty.

Jay.

Background information.

Jay described their current gender identity as "non-binary", preferring the pronouns "he/they". Jay said that he is a busy musician, performer, activist and has a passion for English language. Jay is 14 years of age, has one older sister and lives with their parents in a village in the south of England. Jay chose to be interviewed alone.

Gender development and hopes for the future.

Jay described first questioning their gender identity aged 8. They described that at this time "*lesbian"* felt like the most fitting way to make sense of their different experience, because they did not yet know of differing gender identities. Jay shared that when they started high school they "*came out*" as *"trans*", initially identifying as "*FtM",* describing a period of masculinisation and rejection of femininity. They described an initial desire to fit with other trans people they had seen, who often appeared binary in their trans identity. Jay shared that they now identify as pansexual.

Jay attended their first appointment with GIDS just under a year ago and has attended about eight appointments so far. They are considering top surgery in the future but have no other plans for other physical interventions.

Puberty experiences and expectations.

Jay discussed 'breasts', 'periods', 'shape of body', 'sexuality' and 'vaginal changes' as the biggest changes in puberty.

Periods – painful, natural, feminine?

Like Aaron, Jay also shared experiences of painful periods *"I have always hated periods, they just suck. I feel like nobody enjoys them. They are really bad, and I get really bad period pain".* Similarly, Jay also shared a mixture of feelings, feeling that they are natural and somewhat exciting at first, but also feeling that they were a *"reminder of femininity".* Jay shared how his "*body dysphoria*" has lessened over time

"*I know that my periods are just a part of me, and a part of the process that my vagina goes through. Erm, it is a distinctly feminine trait, but for me it isn't necessarily, it just means that my cervix is working in the way that it should.".*

Breasts – discomfort, objectification and sexualisation

Like Jordan, Jay also spoke about breast growth. Jay described their discomfort not necessarily with breasts themselves, but more regarding their utility for others to ascertain gender by, as well as society's sexualisation of breasts.

"I didn't enjoy the association that came with them…as a societal perception of them, it was…how I was identified as a female, and as a woman and it's also how I'm objectified as a woman, which is not something that I wanted happening to me"

Exploration and fitting in

Like Aaron, Jay also spoke about puberty as a time of exploration "*figuring out where the hell I am"* as well as working out where they fit in with others *"there was some idea of like I don't quite fit with the girls who are around me. I don't think I'm the same as them".* Jay spoke about the role their sexuality played in this exploration as well as the pressure to fit stereotypes of *"lesbian"* or *"trans"* they had seen in the media *"at first I did massively box myself into the male identity".* They described how this led to giving up interests such as feminist activism and artistic make-up in order to 'fit' the trans identity they had seen on social media. *"I had so totally dissociated myself with the female gender and identity".* They shared that they appreciate engaging in these interests now.

IUS and Puberty knowledge.

Jay scored 33 on the IUS, this is the highest score of participants without autistic traits or social communication problems. In comparison to published means, this score is higher than the average reported for young people without autism, and more in line with the average reported for those with autism. Jay spoke about anxiety and low mood he has experienced, which was likely reflected in this score. Jay demonstrated a thorough understanding of puberty, providing detailed answers, scoring joint top along with Aaron (with a score of 22). Jay said that they learnt about the topic via sex education at school, personal research and from friends.

Case summary.

Jay presented as a thoughtful 14-year-old, reflecting upon a range of experiences of puberty with relative ease. Like Aaron, they spoke of a journey of feeling different and finding where to fit in, sharing how their experience of the world around them influenced their exploration. Jay is the only participant who identifies as non-binary, describing that although he does not

necessarily feel wholly comfortable in the 'male' identity, this has felt like a more comfortable position to hold in comparison to 'female'. It may be expected that someone who experiences high levels of intolerance of uncertainty may experience a non-binary identity as being uncertain, but it is interesting that this is not the case with Jay, but instead seems that the *"fluid"* nature has provided freedom and movement to appreciate aspects of both 'feminine' and 'masculine' identities.

Rian.

Background information.

Rian shared his gender identity as a "boy" and uses he/him pronouns. Rian is an active karate student, scout, animal lover and keen cook. Rian is 12 years old and lives with his younger brother and parents in a small town in the south of England. Rian requested to be interviewed with his mum in the room.

Gender development and hopes for the future.

Rian shared his experience that in his memory he has never been anything other than a boy. Rian first attended GIDS when he was six years old, and he has used male pronouns within friends and family since he was eight. Rian shared how when he was younger he always played with the boys.

Rian has recently started taking hormone blockers, and is thinking about testosterone, but said that he does not feel ready to yet.

Puberty experiences and expectations.

Rian discussed 'period', 'being called Master rather than Ms or Miss', 'puberty blockers' and 'acceptance' as big changes during puberty and was unable to think of a fifth change.

Rough periods.

Rian, like Jay and Aaron also spoke about difficult experiences of periods. Rian's mum shared how Rian's first period was a *"rough"* experience which Rian described as "*fast flowing river rapids".* Rian spoke about the dysphoria he experienced *"I didn't feel like me when I started periods and stuff, because it shouldn't be me dealing with this"," I knew it would have eventually come, but it was just…not right in anyway what so ever. It didn't feel right, it shouldn't have been right, it just wasn't right".*

Being recognised as me.

Rian's changes of 'being called Master rather than Ms or Miss' and 'acceptance' both led to conversations about being recognised for who you are and being recognised as a boy. Rian spoke about understanding why some people might find it difficult, whilst also describing some frustrations.

Treated differently.

Rian also spoke about experiences in which he was treated as different to his peers, having to use the girls' toilets and being put in a room of *"oddballs"* on a residential trip rather than being put with his friends.

IUS and Puberty knowledge.

Rian scored 16 on the IUS, the lowest score of all participants and lower than published averages. Rian scored 14 on the puberty quiz, again the lowest score of all participants. This

may be expected considering that he is the youngest participant. Rian provided more detailed answers of male typical development in comparison to female development and said that he has learnt what he knows through school.

Case summary.

Unlike Jordan, Aaron and Jay, Rian found it more difficult to think of changes in puberty to speak about. It is interesting that whilst other participants spoke about physical changes Rian preferred to talk about more social changes. Although this may be age related, Rian explained that he and his family rarely talk about gender or puberty, sharing that he *"might as well get along with my life instead of think, or worrying about stuff in the future. Just might as well enjoy each day, and get more from life. Not try to be any different just be like…who you are".* This approach may also contribute to his low scores on the IUS and puberty quiz.

Alex.

Background information.

Alex described his gender identity as "FtM'" and uses he/him pronouns. Alex reported first identifying as FtM aged 11. Alex is a committed fan of sci-fi TV programme 'Warehouse 13', having watched the series almost 9 times, he said that he also enjoys the TV programme 'Supergirl' because it is *"very gay".* Alex also enjoys watching YouTube and writes fanfiction and poetry.

Alex is 13 years old. He is currently not attending school fulltime due to the pressures of school work becoming overwhelming, he said that he is hoping to return soon. He lives with his older brother, mum and dad in a small town in the south of England. Alex is currently in the process of being assessed for an Autism Spectrum Condition.

Alex requested his parents remain for the first part of the interview and asked them to leave after the ice breaker task.

Gender development and hopes for the future.

Alex has used he/his pronouns since he was about 11 or 12, requesting a change of pronouns in year 8 of school. Alex's parents said that he has never been a *"girly person"*. Although Alex did not speak about gender related distress as a child he recalled asking whether he could be a boy when he was 4. Alex said that when he got his hair cut short in the summer holidays between year 7 and year 8 people immediately started assuming that he was a boy, he described that *"there were a few awkward weeks where I was like…no I'm actually a girl…"*.

Alex first attended specialist GIDS about a year and a half ago and has attended about six appointment so far. Alex said that he would like to start hormone blockers with the aim of starting testosterone as soon as possible. Alex said that in the future he would like top and bottom surgery.

Puberty experiences and expectations.

The personal construct task did not seem to fit well with Alex's thinking style, and talking about puberty was difficult. Alex wrote 'voice cracks' as one change that happens in puberty, but requested to discontinue the task, but agreed to continue with the interview. We spoke instead about other changes in puberty or *"when on T"* (after starting testosterone) including preference for breasts not to grow in order for top surgery to be easier, facial hair, fat moving from other parts of the body to the stomach, getting a wider neck and an Adam's apple.

Changes when taking Testosterone.

Alex shared mixed views about voice cracking, explaining that it is *"funny", "because it happens to everyone at the same time".* Alex said in terms of his own voice cracking that *"it will be good when it happens when I'm on Testosterone".* When asked to indicate where he is on a continuum between 'voice cracking' and 'nothing changing' Alex indicated that his voice had already cracked but that he would want it to be lower when he is taking testosterone. It was difficult to discover what Alex made of this, whether he is making sense of having a deeper voice than assigned female peers or whether there is some belief that his voice has cracked, and this reinforcing that fact that he is "really male".

"Didn't want female things".

Both Alex and his parents spoke about his preference throughout his childhood to not wear *"female things"* such as dresses or *"sparkly shoes".* They also spoke about Alex playing football with the boys.

IUS and Puberty knowledge.

Alex scored 54 on the IUS which may be thought to reflect current experiences of anxiety which he shared in addition to possible autistic traits. Alex requested not to complete the puberty quiz. In conversation he appeared to have some knowledge of the impact of testosterone, but knew less about Oestrogen, explaining *"I have it, but I don't know what it is".* Alex appeared to know what he knew about hormones via the experiences of FtM people on Youtube. Alex was surprised that young people might learn about puberty at school.

Case summary.

Alex engaged in some discussions but declined others. This was different to other participants who spoke about puberty with ease, or found different ways in which to communicate (writing, or potentially limiting conversation to what they felt most comfortable with). Alex's strategy to manage the difficult topic of puberty, in the interview, was to avoid it. Given his reported lack of knowledge regarding pubertal changes, this strategy may have also been applied more widely. Alex's high IUS score suggests that avoidance is likely an effective strategy to minimise distress in the short term, especially taking into account possible autistic traits.

In terms of future plans Alex was the only participant to report wanting all physical interventions offered, many other participants were tentative or unsure at this time. Given his suggested intolerance of uncertainty this plan may be perceived to offer more certainty.

Puberty experiences and expectations similarities and differences.

The below themes were pertinent when comparing and contrasting themes across all participants.

Conflict.

Rian only spoke of his discomfort of pubertal bodily changes which he felt "weren't right". In comparison, Jordan, Aaron and Jay all shared mixed feelings regarding changes in puberty. Some changes were seen positively as being "natural" or signs of growing up, and some changes i.e. voice, hair and body shape were experienced as already more similar to assigned male peers. Jordan, Aaron and Alex all reported upon changes having occurred that were experienced as more in line with male development, despite not yet being on a physical intervention. On the other hand, menstruation and breast growth were discussed as being

alarming, painful and feminising/de-masculinising, causing distress at a time in which individuals wanted to feel more masculine.

Pain and discomfort.

Experiences of pain and discomfort during menstruation were shared by Aaron, Jay and Rian. Although experiences of pain may not be unusual, the experiences described were considered to be beyond what would be expected for an average assigned female.

Difference and fitting in.

All participants described differences to assigned female peers including disliking feminine clothing and playing with boys when they were younger. Aaron and Jay both spoke about attempts they made to fit in; Aaron spoke about trying to be more feminine whilst Jay spoke about rejecting femininity. Jordan, Aaron and Jay also commented upon some of their current interests which may be perceived as typically feminine, but reported feeling that the "validity" of their transgender identity may be brought into question. Although this may seem contradictory to the male identity, this seems to have been described as a way of exploring gender identity and expression.

Puberty Knowledge Quiz Summary

As might be expected, puberty knowledge was strongest in the older participants and weaker in the youngest. Individuals' knowledge in terms of gendered development was mixed. This appears to be more varied in comparison to Hurwitz et al. (2017) where it was reported that children's knowledge of assigned males' reproductive system was stronger. Participants appeared to demonstrate greater pubertal knowledge overall in comparisons to Hurwitz et al. (2017). This is likely impacted by the older age of the participants in the current study and different teaching practices in the UK in comparison to the United States, but may also

suggest that gender diverse young people may know more about puberty in comparison to non-gender diverse peers.

IUS Summary

In line with findings presented in Boulter (2014), individuals in this research who have or are thought to experience social communication problems/autism (Jordan and Alex) had higher IUS scores. They both reported finding puberty difficult to speak about, and appeared to have less thorough knowledge of puberty compared with other participants in this study. This is of particular interest when both individuals hope to start taking hormone blockers and may feel apprehensive about uncertainty around upcoming changes and whether these might be in line with female or male puberty.

Summary of Results

The varied experiences shown in the case studies demonstrate the complexity and individual nature of the young people's experiences of puberty and gender. Although the young people had very different experiences, themes of 'conflict', 'pain and discomfort' and 'different and fitting in' were shared. There were also variations in levels of intolerance of uncertainty and in pubertal knowledge. For some young people, intolerance of uncertainty appeared to act as a reason to learn more about puberty, whilst for others it appeared as though intolerance of uncertainty may have contributed to a desire to avoid learning about puberty. The two young people with autistic traits (Jordan and Alex) indicated higher levels of intolerance of uncertainty and both found it difficult to talk about puberty, demonstrating lower level of pubertal knowledge in comparison to their same age peers.

Discussion

The aim of this research was to gather data on the expectations and experiences of puberty for gender diverse young people who are AFAB, exploring levels of intolerance of uncertainty, pubertal knowledge and where they get their information regarding puberty from.

Themes of conflict presented in this research appear to be complex. Previous research has suggested that boys frequently eagerly anticipated pubertal development, whilst girls tended to be more apprehensive (Hurwitz et al. 2018). Many of the participants in the current study both anticipated growth as well as finding it very difficult. Although body dissatisfaction is not uncommon during adolescence, the participants in this study shared their discomfort with the female body, describing painful, objectifying and de-masculinising experiences. The excitement and pride that some of the young people described may be considered to be more in line with the manner in which assigned males approach puberty in comparisons to assigned females, contributing to this conflict.

In addition to the theme of 'conflict' found within the current study, many of the individuals also shared experiences of 'pain and discomfort' of female puberty. This could be considered in a numbery of ways; the dysphoria related to signs of female puberty may influences one's tolerance of this pain or discomfort, and/or pain and discomfort may contribute to an individual's dysphoric feelings. Although literature has spoken about feelings of shame associated with female puberty (Martin, 1996) there is no literature exploring links between physical pain and discomfort and gender diversity.

Many of the participants experienced feeling different from other female peers, and described efforts to fit in to what were described as 'feminine' or 'masculine' stereotypes.

Participants also shared experiences of feeling a requirement to fit a 'trans' identity, feeling that any 'feminine' interests may invalidate their trans identity. Marchiano (2017) and de Graaf et al. (2018) similarly spoke of concerns of the pressures experienced by gender diverse individuals to 'fit' rigid gender typical identities. Society's binary expectations in combination with autistic traits and intolerance of uncertainty threaten to restrict adolescents' opportunity to explore gender identity and expression which was described to be invaluable by Aaron and Jay.

Limitations and research recommendations

Researching a topic as sensitive as puberty in gender diverse youth raised a number of challenges, the result of which may be seen in the likely biased sample who participated. Although inclusion criteria allowed for people from age nine to 14 all participants were towards the upper end of the range. It would be of interest to know why this younger group was not put forward for the study, and how this group may differ.

In the current study high levels of Intolerance of uncertainty were indicated by the two individuals with autistic traits. This was also associated with difficulties talking about puberty, and a relative lack of pubertal knowledge. Further research is needed to determine whether this might be seen in other individuals within the population and to better understand this association.

Clinical recommendations

Clinicians working with young people, and particularly those in gender services should to be aware of the conflict experienced by young people in terms of gender and pubertal experiences and how these may be influences by pressures to 'fit' expected binary or 'trans' identities. These pressures may limit young people's opportunities to explore different identities and expressions.

Pubertal knowledge continues to be varied, considering the conflict experienced by young people in this study, in additional to the decision they will be making regarding physical interventions in this study it is vital that all young people have access to quality education about pubertal changes across genders.

Conclusion

The present study focused upon gaining an in-depth account of the experiences and expectations of puberty of five gender diverse young people AFAB. Young people spoke about conflicting feelings towards puberty, differences from assigned female peers and pressures to fit in. Intolerance of uncertainty and pubertal knowledge measures were helpful in offering additional ways to understand these experiences.

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Section C: Appendix of Supporting Materials

Appendix A. Methodological appraisal of qualitative papers

Methodological appraisal of qualitative papers - Using guidelines adapted from Elliot, Fischer and Rennie (1999)

Criterion	Bargiela, Steward & Mandy (2016)	Cridland, Jones, Caputi & Magee (2014)	Kanfiszer, Davies and Collins (2017)	Kuvalanka, Mahan, McGuire & Hoffman (2018)	Strange et al. (2018)
Owning one's perspective	The authors present their research questions based upon the literature. Researcher assumptions and orientations are not discussed.	The authors present the need for their research based upon *"research literature and by families themselves".* Researcher assumptions and orientations are not discussed.	The authors present their research questions based upon the literature, stressing the importance of priorities of a UK autism community reporting the need for research looking at life experiences as opposed to aetiology. Researcher orientations are not discussed.	The authors present their research questions based upon the literature. Researchers aim to take a "essentialist theoretical approach".	Gender diverse and autistic gender-diverse self-advocates were collaborators in the analysis as well as co-authors of the study. Information regarding each analyst was provided.
Situating the sample	Participant demographics are presented, including age at diagnosis and employment. Recruitment methods discussed.	Participant demographics are presented, including age at diagnosis and current educations/employment. Recruitment methods discussed.	Some participant demographic information is given, further information is given in context to their quotes. Recruitment methods discussed.	Participant demographics are described in detail. Recruitment methods discussed.	Participants demographics are presented in a table. Recruitment methods discussed.

Grounding in examples	Framework analysis used. Several clearly relevant quotes presented for each theme.	Interpretative phenomenological analysis used. Several clearly relevant quotes presented for each theme.	Narrative Analysis used. Relevant quotes are described and discussed in detail.	Inductive thematic analysis used. Relevant quotes are described and discussed in detail.	Framework analysis used. Several clearly relevant quotes presented for each theme.
Providing credibility checks	Creditability checks used and described, including consensus checks between authors, auditing final themes and checking with participants.	Creditability checks used and described, including research team reviewing all transcripts and themes.	Credibility checks used including reflective memoing and respondent validation.	Analysis was conducted jointly by two of the authors.	Analysis conducted by 5 analysts including Gender diverse and autistic gender-diverse self-advocates. A group of five key stakeholders provided feedback regarding indexing and mapping of themes.
Coherence	Themes and subthemes presented in table and discussed.	Themes discussed with use of quotes.	Quotes and categories discussed.	Themes discussed with use of quotes.	Themes discussed with use of quotes.
Accomplishing general vs. specific research tasks	Authors seem to present a general understanding of the research findings although do acknowledge the limited and potential biases within the sample.	Authors discuss specific themes within the research making general links with comparisons to relevant literature. Limitations are discussed.	Authors discuss specific themes within the research making general links with comparisons to relevant literature. Limitations of the small heterogenous sample are discussed.	Authors discuss specific themes within the research making general links with comparisons to relevant literature. Limitations of the small homogenous sample are discussed.	Authors discuss specific themes within the research making general links with comparisons to relevant literature. Demographic limitations of sample were discussed.

Resonating with readers	Analysis fits with quotes provided and themes were checked with participants. However, discussion makes more general rather than specific conclusions.	Analysis fits with quotes provided, describing individual accounts and similarities across the participants.	Narratives of individuals are presented thoughtfully whilst comparing and contrasting their experiences across the participants. Respondent validation was also used.	Analysis fits with quotes provided, describing individual accounts and similarities across the participants.	Analysis fits with quotes provided and themes. Feedback on themes provided by stakeholders.

Appendix B. Methodological appraisal of Case reports

Methodological appraisal of Case reports using Joanna Briggs Institute appraisal checklist

Criteria	Kraemer, Delsignore, Gundelfinger, Schnyder & Hepp (2005)
Demographics clearly described	Clear description of case presented.
History clearly described	History brief, but present.
Current clinical condition clearly described	Brief but present.
Diagnostic tests, assessment and methods clearly described	Assessment described in narrative and presented in table.
Intervention/ treatment clearly described	N/A – intervention not part of case presentation
Post intervention condition clearly described	N/A – intervention not part of case presentation
Adverse or unanticipated events identified and described	Behaviour during assessments was commented upon.
Suggests take away lessons	Consideration of overlaps between Gender identity disorder and Autism, proposition that for the presented case Gender identity disorder may be conceptualised as secondary feature of Autism. Suggestion that Autistic characteristics are generally associated with masculinity and may have led to a subjective consciousness in our patient of being male".

Appendix C. Methodological appraisal of Cross-sectional studies

Methodological appraisal of Cross-sectional studies using Joanna Briggs Institute appraisal checklist

Criteria	Kristensen & Broome (2015)	Walsh, Krabbendam, Dewinter & Begeer (2018)
Appropriate sample frame to address target population?	Authors comment that due to the use of snowball sampling it is difficult to know whether or not the sample is truly representative of the transgender population. Authors report that steps were taken to avoid community bias, and considerations taken that the online nature of the survey may restrict the sample.	Authors comment upon the greater proportion of Autistic adults, assigned female at birth who took part in the study. This is not reflective of gender ratios reported in general autistic population, but this ratio is contested. The authors aimed to address this by statistically resampling the data. No participants were reported to have IQ < 70.
Were study participants samples in an appropriate way?	Snowball sampling technique prompted a reasonable response in a 'hard to reach' population, however may not be representative. Selection and responder bias's considered in terms of a likely over-representation of people with an ASC.	Little information given apart from recruited via Netherlands Autism Register.
Adequate sample size?	Final data set included 446 people.	Final data set included 613 adults, 56 were excluded from the analysis due to incomplete answers.
Subjects and setting described in detail?	Subject information given including age, gender identity and AQ score.	Some demographics provided (age, employment, education, living situation and children). No information about race.
Was data analysis conducted with sufficient coverage of identified sample?	Low response rate identified for over 64 years olds, response rates depending on specific gender differed as might be expected in line with general population.	Very small number of 'non-binary trans' people (6), therefore they were merged with the 'trans' groups. Therefore results ascertaining to 'non-binary trans' should be interpreted with caution.
Were valid methods used for identification of the condition?	Gender variance and diagnosis of autism was self-reported, the AQ-10 (validated measure) was used to measure autistic traits.	Gender identity was self-reported. Participants self-reported diagnosis of autism.
Was condition measured in a standard, reliable way for all participants?	All participants completed the same survey.	All participants completed the same survey.

Was there appropriate statistical analysis used?	Mean comparisons presented with confidence intervals but not clearly described.	ANCOVA, Wilks' lambda and Fisher's post-hoc test used.
Was the response rate adequate, or managed appropriately if low?	Response rate and excluded responses are described.	Response rate and excluded responses are described.

Appendix D. Methodological appraisal of Case-control studies

Methodological appraisal of Case-control studies using Joanna Briggs Institute critical appraisal checklist for case control studies

Criterion	Bejerot & Erikson (2014)	Cooper, Smith & Russell (2018)	Dewinter, De Graaf & Begeer (2017)	George & Stokes (2018)	Stauder, Cornet & Ponds (2011)
Comparability of groups	Controls selected and matched on age and gender to Autism group. Differences in the Autism group may be considered typical for that group (i.e fewer women using contraceptive pill, cohabiting with partner).	No significant differences between the groups reported. Case matching not utilised.	Large control group used, did not differ according to sex nor age. Proportion of controls with lower educational level was significant.	No differences reported between two groups.	Cases matched by age and gender. No differences reported in IQ or age.
Appropriately matched/sourced	Both groups recruited in a number of settings.	Groups recruitment via similar methods.	Little discussion of how controls were invited to take part in survey.	Little discussion of how Autism group were recruited apart from "via autism associations".	ASC group recruited via Mental Health clinic whilst controls recruited via University and family members.
Same criteria used for identification of cases and controls	Same exclusion criteria was used for both groups with the exception of Autism diagnosis and Autism In a first-degree family member.	Sam criteria used for both groups.	No inclusion/exclusion criteria discussed.	No inclusion/exclusion criteria discussed.	No inclusion/exclusion criteria discussed.
Validity and reliability of case	Autism diagnosis checked via medical	Autism diagnosis was self-reported	Autism diagnosis self-reported, validated	'diagnosis of Autism' not discussed how or	Autism diagnoses were made by

selection	records and confirmed in an independent diagnostic interview.		measure was also used to verify autistic traits.	when this was given or tested. However, a validated measure was used to verify autistic traits.	experienced clinicians.
Were groups measured in the same way?	Both groups participated in the same procedure	Additional questions regarding diagnosis were asked of the Autism group.	Groups completed separate surveys, same questions taken from surveys for analysis. Only Autism group answered question regarding gender identity.	Both groups participated in the same procedure	Control group completed the Autism Quotient in addition to other measures and completed a "less time consuming" measure of IQ compared to the measure completed by the Autistic group.
Consideration of confounding variables	Potential confounding variables were measured and discussed, including: contraceptive pill use and level of education.	Potential confounding variable such as level of education and mental health diagnosis were measured.	Potential confounding variables discussed, including over representation of women with Autism.	Potential confounding variables discussed and measured, including sexuality and autistic traits in both groups, individuals receiving hormone replacement therapy and those with a diagnoses of congenital adrenal hyperplasia.	Age and gender were controlled for, IQ was measured. No other potential confounders discussed.
Strategies used to deal with confounding variables	Confounding variables not controlled for statistically, but discussed.	Confounding variables not controlled, but related limitations presented.	Data of men and women were analysed separately due to known differences. Groups were matched on age	Mediations analysis was used to assess the relation between autistic traits and sexual orientation.	Only case matching used.

			and separate analysis conducted for adolescents.		
Validity and reliability of outcome assessment	Mixture of validated and non-validated measures used	Mixture of validated and non-validated measures used	Well validated questionnaire used. Gender identity questions were unvalidated.	Validated measures used.	Validated measures used.
Appropriate statistical analysis used	Basic means analysis was used(t-test, Mann Whitney-U and $X^{2)}$	Hierarchical multiple regressions used.	Basic means analysis was used, t-tests and X^2, effect sizes reported	Range of statistical tests used including mediation analysis and inclusion of post-hoc testing where appropriate.	Basic means analysis used (t-tests), post-hoc testing where appropriate.

Appendix E. NHS Research Ethics Committee Favourable Opinion

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Appendix F. HRA Approval

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Appendix G. Trust R &D Approval

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Appendix H. Participant Information sheet

Canterbury Christ Church University

Information about the study (Young people's information)

Exploring puberty in gender diverse youth: Experiences of assigned females.

Introduction

Hello, my name is Felicity Caryer and I'm a Trainee Clinical Psychologist at Canterbury Christ Church University. I would like to invite you to take part in my research.

Before you decide, it is important you understand why the research is being done and what it would involve for you. Hopefully this information sheet will help explain more about the research, you can speak with me, or with the [redacted] if you would like to know more.

Why are you doing this research?

I hope to learn more about what young people who attend [redacted] think and feel about puberty. I am particularly interested in the views of young people assigned female at birth.

Do I have to take part?

No. It is up to you whether or not you want to take part. If you agree to take part I will ask you and your parents/guardians to sign a form which says that both you and they have agreed that you can take part. You can decide not to take part at any time, without giving a reason. This would not affect the service you receive from [redacted]

What are the possible positives of taking part?

Taking part will give you the chance to discuss your thoughts and feelings about puberty. I hope that what we talk about will also help other people to better understand your experience. You would also receive a £10 Amazon voucher as a thank you for your time.

What are the possible negatives of taking part?

Some of the questions I ask may be about topics that are difficult for you to talk about. I will ask lots of questions about puberty; for example, what do you think are the biggest changes in puberty? If you feel upset or anxious in the interview, please let me know. If I can see that you are upset I will ask if you would like to continue or not, the decision will be yours.

Will other people know about what we discuss?

Everything we discuss in our meetings will be confidential (will not be shared with anyone else), unless I am worried about you. If I am worried – I will try to discuss this with you first, but I might contact your clinician [redacted]

When I write up what we speak about, I will use a different name (of your choice) so people don't know that it is you.

Once my report is written we hope to publish it, this is to allow other professionals to read it and learn more about gender diversity.

Canterbury Christ Church University

What will happen if I take part?

If you and your parent/guardians are happy for you to take part please sign the enclosed consent/assent forms. I will then speak to your parent/guardians and you (if you would like) via the phone to arrange a time and a place to meet. We could meet at [redacted] at your home or somewhere else that we agree.

When we meet we will talk about what will happen and I will check with you and your parent/guardians that you still want to take part. I will also check that your parent/guardians are still happy for you to take part.

The meeting will take about 1- 2 hours. We can be flexible and take a break whenever you want. A parent/guardian needs to be close by, but it is your choice if you would like them with you during our meeting – anything they say will not be included in the research.

During our meeting I will ask you about important people in your life. I will then ask you some questions about what you know, think and feel about puberty. Finally, I will also ask you to fill out a questionnaire asking about uncertainty.

I will record our meeting using a digital audio recorder. This is so that I don't forget what we speak about. The only people who will listen to this are me, and maybe my tutors from university. After our meeting I will write up (transcribe) our meeting, word for word, this helps me to look for patterns in what you or others say.

In my write up I will look at what we spoke about in our meeting and the questionnaires you completed. I will also look at the gender identity questionnaire you completed during assessment with [redacted]; this is to help me gather as much information as possible.

After meeting with about 8-12 people to hear their views I will write up a report about what you and others have said, picking out any similarities and differences in your views.

Appendix I. Parent/Guardian information sheet

Information about the study (Parents/guardians)

Exploring puberty in gender diverse youth: Experiences of assigned females.

Introduction
Hello, my name is Felicity Caryer and I am a Trainee Clinical Psychologist at Canterbury Christ Church University. I would like to invite your child to take part in my research study.

Before you and they decide it is important that I provide further information about why the research is being done and what it would involve. Hopefully this information sheet will help explain more about the research. Please feel free to speak with me or with the GIDS team if you would like to know more.

Why are you doing this research?
I hope to gain a better understanding of the thoughts and feelings that people who are accessing GIDS have towards puberty. I am particularly interested in the views of young people assigned female at birth.

Does my child have to take part?
No. It is up to you and your child whether or not to take part. If you and they agree I will ask you to complete a consent form on their behalf and for them to complete an assent form to show that they are also happy to take part. You/they can decide not to take part at any time, without giving a reason. This would not affect the service they receive from GIDS.

What are the possible positives of taking part?
Your child may want to share their views regarding puberty and gender. I also hope that discussions from the study will help other people understand more about your child's and other young people's experiences. Your child would also receive a £10 Amazon voucher in appreciation of their time.

What are the possible negatives of taking part?
Some of the questions I ask may be about topics that are difficult to talk about. I will ask some questions about puberty; for example, what do you think are the biggest changes in puberty? I will ask your child, if possible, to let me know if the interview is causing any stress or anxiety and we can stop at any time. If I can see that your child is becoming distressed by the interview I will ask if they would like to continue or not.

Confidentiality
Everything discussed in the interviews will be confidential. If I have concerns regarding your child's wellbeing I may want to share this with your GIDS clinician, however in this instance I would aim to discuss this with you first.

All potentially identifiable information will be anonymised within the report.

What will happen if I take part?

If your child wants to take part and you are happy for them to take part, I ask that you sign the enclosed consent form and that your child signs the assent form. Please send me one copy of each or give it to a GIDS clinician and keep the second copies for your own records. I will then call you to answer any questions you might have and to arrange a time and a place to meet. We could meet at GIDS, at your home or another agreed location.

When we meet we will talk about what will happen in the interview and I will check again that your child is happy to take part and you are still happy for them to take part in the study.

The meeting will take about 1- 2 hours, we can be flexible and take a break whenever your child wishes. I ask that a parent/guardian stays close by, but it is yours and your child's choice if you would like to stay in the same room during the interview. If you remain in the room during the interview anything you say will not be included in the research.

During our meeting I will ask your child about important people in their life, I will ask some questions about what they know, think and feel about puberty. I will also ask them to fill out a short questionnaire about uncertainty.

I will record the interview using a digital audio recorder. This is so that I don't forget what is spoken about. The only people who will listen to this are me, and maybe my tutors from university. After our meeting I will transcribe the meeting, word for word, as this helps me to look for patterns in what your or other children say.

In my write up I will look at what we spoke about in our meeting and the questionnaires you completed.

After meeting with about 8-12 young people to hear their views I will write up a report about what your child and others have said, picking out any similarities and differences in their responses.

Will my child's information be stored?
Canterbury Christ Church University will securely store your consent and assent forms for 5 years after the study is published. All other data (including audio recordings) will be destroyed once the study is published.

Who is organising and funding the research?
This study forms part of my professional Doctorate Clinical Psychology training and has been organised by myself, Professor Jan Burns (Canterbury Christ Church University) and Dr Sophie Landa (GIDS) with approval by Canterbury Christ Church University.

Who has reviewed the study?
All research in the NHS is reviewed by an independent group of people, called a Research Ethics Committee.

What if there is a problem?
If you have any worries or concerns about any part of this study you can speak with me by leaving me a message on 01227 92 7070, and I will get back to you to try to resolve the matter as soon as I can. If you remain unhappy and wish to complain formally, you can do this by contacting Professor Paul Camic, Research Director, Department of Applied Psychology, Salomons Centre, 1 Meadow Road, Tunbridge Wells, Kent. TN1 2YG, Tel: 01227 92 7070 or email: paul.camic@canterbury.ac.uk

Further information/contact details
If you would like to speak to me and find out more about the study or have questions about it answered, you can leave a message for me on a 24-hour voicemail phone line at 03330117070. Please say that the message is for me [Felicity Caryer] and leave a contact number so that I can get back to you.

Appendix J. Participant Assent form

Assent form for participants

Title of project - Exploring puberty in gender diverse youth: Experiences of assigned females.

Name of researcher: Felicity Caryer

Please tick the box

1. I have read information sheet for the above study and have been able to ask questions about it. ☐
2. I understand that it is my choice to take part in this study and that I can drop out (withdraw) at any time, without giving reason. I understand that my medical care will not be affected. ☐
3. I understand that everything we discuss in the study interviews will be confidential (will not be shared with anyone else), unless there are concerns about my wellbeing. ☐
4. I understand that the interview will be audio recorded in order that it can be written up word for word (transcribed). ☐
5. I understand that the Gender Identity questionnaire I completed during my assessment at GIDS wil included in the research. ☐
6. I understand that no information that would identify me will be included within the report. ☐
7. I understand that parts of the interview may be quoted exactly as I said it in the published reports of the study. In this case, I am aware that I will choose a false name so others do not know that it is me. ☐
8. I agree to take part in the above study. ☐

_____	_____	_____
Name	Date	Signature

Appendix K. Parent/Guardian consent form

Consent form for parents/guardians

Title of project - Exploring puberty in gender diverse youth: Experiences of assigned females.

Name of researcher: Felicity Caryer

Please tick the box

1. I confirm that I have read and understood the information sheet for the above study. ☐
2. I have had the opportunity to consider the information and ask questions. ☐
3. I understand that my child's participation is voluntary and that they are free to withdraw at any time, without giving reason. Their medical care will not be affected. ☐
4. I understand that if my child wishes for me to stay in the room during the interview, then anything I say will not be included in the study's analysis. ☐
5. I understand that the interview will be audio recorded for the purposes of transcription. I am aware that this recording and the transcript will be stored confidentially with an encryption that only those involved in the data collection and analysis will be able to access. I understand that the disposal of this data will be carried out in line with the Data Protection Act, National Health Service, Canterbury Christ Church University and British Psychological Society policies and procedures. ☐
6. I understand that the Gender Identity questionnaire my child completed during their GIDS assessment will be included in the research. ☐
7. I understand that no identifiable information will be included within the report. ☐
8. I understand that parts of the interview may be quoted verbatim in the published reports of the study. In this case, I am aware that my child's identity will be protected by using a false name. ☐
9. I agree to allow my child to take part in the above study. ☐

_____	_____	_____
Name of participant	Date	Signature
_____	_____	_____
Name of person taking consent	Date	Signature

Appendix L. Interview Protocol

Interview Protocol

Overview
Consent – 10mins
Ice breaker task - 10mins
Personal construct exercise – 30mins
15 minute break
Intolerance of Uncertainty Scale – 5mins
Puberty Test – 10mins
Reflections/additions – 10 minutues
Thanks and finish – 5 minutes

Consent – 10mins

Demographics/Intro

Name
Age
Prounouns

Ice breaker task - 10mins

Rapport building activity on family relations

Background questions

How would you describe your gender identity today?

How old were you when you started to identify with your current gender identity?

How did you identify before then?

How many times have you met with Gedner services? When was your first meeting?)

What is your plan with Gender services? Do you have any hopes for the future? (Phsyical interventions?)

Personal construct exercise – 30mins

Can you tell me what you think are the 5 biggest changes that happen in puberty?

What do you mean by...?
Why is….. a big change?
Can you tell me what you think about...?

What do you think would be the opposite of...?
What do you think about....?

On a scale from....to your opposite....where would you put yourself now?
And where would you like to be?

15 minute break

Intolerance of Uncertainty Scale – 5mins

Puberty Test – 10mins

Reflections/additions – 10minutes

Is there anything we missed/you want to add to the previous task?

Do you have any other comments?

How was the interview? – anything you would change?

Thanks and finish – 5 minutes

Appendix M. Intolerance of Uncertainty Scale

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Appendix N. Puberty Knowledge quiz

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Appendix O. Reflective Research Diary Extracts

12.12.16

Initial choice of topic

Considering the various reasons that drew me to the topic; personal interests in gender differences, opportunity to utilise social constructionist positions for qualitative research as well as the topic being pertinent in the current news and media.

On initial reading around the topic I noticed my frustration by reductionist nature of biological explanations that were being put forward, but also struck by the influence these have had, and potential impact they have on how society and services view and respond to gender diversity.

31.10. 17

Stakeholders meeting – gathering feedback on initial interview structure

Noticed my own anxiety about talking about a sensitive topic (puberty) to a population of young people I had no experience with. Although conversations were easier than I may have anticipated, this anxiety may impact upon my interviews. This is something that I hope with practice and exposure will improve, however it is important to remain aware of.

Although I am not surprised by individual's dislike of the use of images to aid discussion around puberty knowledge (as used in previous studies), the level of dislike and aversion was surprising. This again draws attention to how difficult these conversations might be and how I need to adapt my interview structure and the puberty quiz to support this.

1st Bracketing interview with colleagues involved in gender related research

Reading of Tufford and Miller (2010) article on use of bracketing interview in qualitative research. All researchers were yet to start interviews. During interview want to be attentive to: how my own perspective and history may currently inform my perspective of the 'phenomenon', any thoughts/beliefs, developing hypothesis as well as hopes and fears with the aim that these are recognised during interviews and analysis.

Our conversations were initially prompted by thoughts and anxieties of 'who' we will soon be interviewing, predictions upon how participants may present, how they might perceive and respond to us, and how we might respond to them. We acknowledged our bias in the room as three women identifying with our assigned gender and considered the privilege this as allowed us.

I noticed frustrations around binary discussions around gender within our conversation and assumptions.

We noticed that despite people's research focusing on autism, this was forgotten in our conversations. We wondered if this might be true for the people we meet also.

1st interview

Felt very privileged to be able to have such conversations. I was very nervous beforehand, considering how to position myself as a researcher, rather than clinician, building a rapport without impacting the research. Noticing desire to follow conversation that I was curious about, but may divert from the focus of the research.

Reflected on my position. Wanting to balance neutrality with creating an environment which encouraged the participant to feel able to talk. Realised how infeasible it was to stay neutral, but also the importance of me reflecting and holding onto my position. I introduce myself via my pronouns, therefore indicating that I am aware of different ways in which people may identify and promoting this as something to talk about. This approach reminded me of third wave systemic approaches, maintaining my position and being reflexive to that.

Was pleased with how easy the interview structure and elicitation task was to follow and how well this scaffolded discussions, even though the young person shared that it was sometimes difficult to talk about.

2nd interview
Again struck by how thoughtful and insightful the young person was, not sure I would have been able to speak so freely and articulately about gender and puberty at their age. Wonder if/ how the current culture and/or their experiences of Gender impact their ability to speak about the topic.

I noticed a number of similarities and differences between their experiences and my own. I wondered how they might view me, the way they might position me; researcher, therapist, friend? Wonder what they may have thought about my gender expression, and how this may have influenced the interview.

Starting to think about similarities and differences between the two people I have met so far. Both presented quite differently, although similar age, possibly demonstrates the range in development and confidence at this age, and possible impact of social communication difficulties? Also, interesting to consider the difference of having a parent in the room, in comparison to not. Today this likely allowed different conversations, but in the first interview having mum in the room seemed comforting.

25/1/19 - 2nd bracketing interview with colleagues involved in gender related research
Each researcher was at a different stage, two still interviewing and one hoping to start analysis. Therefore, discussion was aimed at both being attentive to emerging themes and reactions during interviews as well as initial analysis.

Due to the qualitative nature of all the research we shared anxieties around how we could not only attend to all of the data that has been gathered, but also integrate and analyse it in a sensitive manner. We shared reactions to stories in the news about the topic and awareness that this could both limit and inform our reporting of the data.

We considered differences between emerging themes from assigned male and assigned females and wondered whether the assigned males initially appeared more rigid in their gender identities and what this may suggest. I also wondered about the younger age of people that I was interviewing and my interview methods which potentially allowed me to have different conversations.

3rd interview
Again, impressed with how thoughtful the young person was, and impressed by their interest and thoughts in terms of gender politics and how this has influenced their view of their own journey with their gender. Impressed how confidently and coherently they spoke about their 'journey' in terms of sexuality and gender.

Their journey had many similarities with the previous interview – and they presented similarly mature for their age, but interesting that their exploration led to a "fluid" non-binary position in relation to gender and similarly fluid position in terms of sexuality and relationships.

4th interview

Very different from the previous two participants, maybe shared more similarities with the first, maybe due to age? Chose to be interviewed with mum and found puberty difficult to talk about.

Mums voice was very present throughout interview but felt helpful to support talking. I need to be aware of this when I analyse the themes.

Different journey in terms of identifying as trans at a very early age, pre-puberty in comparison to other participants who have made a social transition a lot later. Wonder how this history, and support from gender services may influence their presentation and experiences – struck by their "laidback" attitude.

5th interview

Interview did not flow as easily as previous interviews and the participant requested not to continue with two tasks. During the interview I considered how best to proceed and judge whether or not it was appropriate to proceed, the decision to proceed but more conversationally was taken since the young person was keen to talk further, and was confident to say no when their limits were reached.

This was a shock as it was very different to previous interviews. Initially this felt frustrating, but I think that the difficulties experienced are significant and will be important and interesting to consider and analysis. Initial thoughts – impact of social communication problems, influence in not feeling able to even get close to talking about puberty, but able to talk about puberty through trans lens?

Appendix P. Coded transcript examples

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Appendix Q. Coding development examples

Individual Themes - *This has been removed from the electronic copy*

Between Participant Themes

Main themes	Description	Example quotes
Conflict	Positive and negative expectations and experiences of pubertal changes, feeling pride and pain, excited but de-masculinised.	"I think honestly, I think my period kinda set back my masculinity, obviously…because even if I was getting my periods now, obviously having a period would make me feel very very feminine, so when I was on them I was just kinda like no, no, this is normal, it's kinda like a sign of you're female, that's that you know, and you can't really change that.." "but I felt more human for getting my period, so I showed off about it, as much as it is weird to bleed for me, erm, it's human" "So I feel like…it's natural for me to have my periods because I still have a vagina, I still have a uterus but obviously I don't want to have them" "And a couple of my friends had started it and been like really excited, and I was like oh, this is meant to be really good then. And then the next day I got cramps for the first time, and I was like "I do not enjoy this at all" "it just puts me down because it just reminds me of like…my body right now" "I didn't feel like me when I started periods and stuff, because it shouldn't be me dealing with this"
Pain and discomfort	Experiences of pain and discomfort beyond average experiences.	"something about my periods, as I've gotton older my period pains have been so bad that I've almost

		ended up in hospital" "I have really really bad chest pain, like really bad growth pains, erm…like everywhere" "It was like my body saw my period as an actualy virus and was trying to purge myself, I felt so so bad and it was like I had food poisoning," "I have always hated periods, they just suck. I feel like nobody enjoys them. They are really bad, and I get really bad period pain." "you had a rough time that day, that night, that was rough wern't it, to be fair, for anybody, that would have been difficult…it wasn't easy was it. Rian didn't have a easy…you know when some people start their periods…you know light and you ease into it, but no, none of that it was really quite [phwwoooo] R: fast flowing river rapids M: it was horrendous weren't it"
Difference and fitting In	Feeling different from assigned female peers, disliking 'feminine' clothes, attempting to fit in with female, male and 'trans' peers/sterotypes – sometimes limiting ability to engage in 'feminine' activities.	"I don't know like, just the fact of everything else like having arm hair and leg hair and you just not having, it's just seems embarrassing like" "100% went through a period of time whilst on my period in which I acted very feminine around my friends because I was really trying to fit in" "this whole time thinking that I am not normal, you know because you're not, you're in this situation in which you should be experimenting with makeup and instead I'm experimenting with

	how to wear my clothes and bind my chest and do I want a bulge or not, or you know"
	"there was some idea of like I don't quite fit with the girls who are around me. I don't think I'm the same as them, so lets find something I understand to put on that and we'll go with that"
	"everything that I would wear would be grey and baggy, and I like, I couldn't wear anything feminine, or do anything like that, because then that would mean that I wasn't a real boy anymore"
	"I am a makeup artist, I don't do beauty make up. I do gore make up because I like creepy crap, but I did make up for the first time and I felt like a woman, and you know. For a start it didn't feel right, but I didn't really think about that. But it was just another part of growing up"

Appendix R. Dissemination Letter to REC board

Date: 11th April 2019

REC reference number:
Study Title: Exploring puberty in gender diverse youth: Experiences of assigned females.

Dear [chair of REC/ R&D manager],

I am writing to inform you that the above project has now been completed. The research was conducted as planned and the research objectives were achieved.

Summary of research

Aims

The current study aimed to explore the experiences and expectations of puberty for gender diverse young people, assigned female at birth, aged between nine and 14. Levels of intolerance of uncertainty, pubertal knowledge and where they get their information about puberty from was also measured.

Methods

A hermeneutic, embeded multiple case study design was used. Five young people took part in a semi-structured interview including a dyadic personal construct elicitation task to explore experiences of puberty and questionnaires of intolerance of uncertainty and pubertal knowledge. Data was analysed within and between cases utilising with consideration for inductive, descriptive and explanatory themes.

Results

Individual cases were analysed for within case themes revealing a rich picture of individual experiences. Themes of 'conflict', 'pain and discomfort' and 'difference and fitting in' were seen when comparing cases. Levels of intolerance of uncertainty and pubertal knowledge were valuable when considering individuals experiences and expectations of puberty and how this interact with their gender identity and plans for physical intervention. In line with previous research intolerance of uncertainty was higher in individuals with autistic traits.

Discussion

Themes of conflict regarding puberty may be considered as interaction between common assigned male approaches to puberty including exciting in combination with experiences of pain and demasculinisation. Feelings of difference and attempts to fit social constructed views of 'masculinity' and 'femininity' often limited individual's opportunities for exploration.

Arrangements for publication/dissemination

It is intended that findings will be submitted for publication in "International Journal of transgenderism" . At service level findings will be disseminated in the form of a presentation to the team.

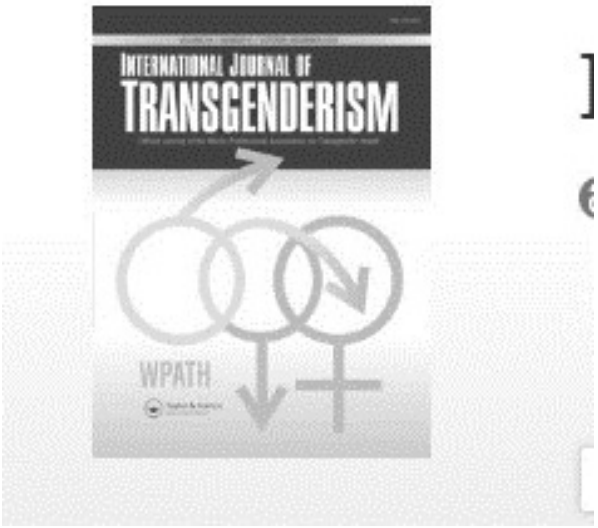
Feedback to participants

A brief summary of findings will be posted out to research participants who requested feedback.

Yours sincerely,
Felicity Caryer

Appendix S. Journal Submission Guidelines

Appendix S. Journal for submission's notes for authors



EDITOR

Walter Pierre Bouman, MD, PhD, *National Centre for Transgender Health, Nottingham, UK*

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