Journal of Adolescent Health 66 (2020) 699–704

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Original article

Psychological Functioning in Transgender Adolescents Before and After Gender-Affirmative Care Compared With Cisgender General Population Peers

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Article history: Received August 23, 2018; Accepted December 20, 2019
Keywords: Gender dysphoria; Transgender; Gender-affirming treatment; Youth Self-Report; Mental health

A B S T R A C T

Purpose: Transgender adolescents are at risk for internalizing and externalizing problems, along with high suicidality rates, and poor peer relations. The present study compared transgender adolescents before and after gender-affirmative care with a sample of nonclinical age-equivalent cisgender adolescents from the general population on psychological well-being and aimed to investigate the possible effect of transgender care involving puberty suppression.
Methods: In this cross-sectional study, emotional and behavioral problems were assessed by the Youth Self-Report in a sample of 272 adolescents referred to a specialized gender identity clinic who did not yet receive any affirmative medical treatment and compared with 178 transgender adolescents receiving affirmative care consisting of puberty suppression and compared with 651 Dutch high school cisgender adolescents from the general population.
Results: Before medical treatment, clinic-referred adolescents showed more internalizing problems and reported increased self-harm/suicidality and poorer peer relations compared with their age-equivalent peers. Transgender adolescents receiving puberty suppression had fewer emotional and behavioral problems than the group that had just been referred to transgender care and had similar or fewer problems than their same-age cisgender peers on the Youth Self-Report domains.
Conclusions: Transgender adolescents show poorer psychological well-being before treatment but show similar or better psychological functioning compared with cisgender peers from the general population after the start of specialized transgender care involving puberty suppression.

IMPLICATIONS AND CONTRIBUTION

This study found increased behavioral and emotional problems among adolescents referred to a specialized gender identity clinic compared with their cisgender peers from the general population. After the start of gender-affirming treatment, the transgender adolescents showed similar or better psychological functioning compared with their cisgender peers from the general population.

In recent years, a sharp increase has been seen in media attention, clinical referrals, and number of publications on adolescents with gender dysphoria (GD), the DSM-5 term used to describe the incongruence between one's birth-assigned gender and the experienced gender [1,2]. A number of these studies report on psychological functioning and show that feelings of GD are frequently associated with psychological difficulties [3].

Conflicts of interest: The authors declare that they have no conflict of interest. This research received no specific grant from any funding agency, commercial or not-for-profit sectors.
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1054-139X/
https://doi.org/10.1016/j.jadohealth.2019.12.018

Adolescents referred to specialized gender identity clinics have prevalence rates of depression ranging from 12% to 58% and for anxiety 16% to 24% [3–8]. In these studies, histories of suicidal thoughts and self-harming behaviors were reported by 34%–51% and 12%–39% of youth, respectively, in the various studies [3–8]. In addition, comparison studies of transgender youth with lesbian, gay, and bisexual adolescents revealed comparable rates of psychological difficulties [9]. Several studies have used the standardized self-report and parental measures of the Youth Self-Report (YSR) and the Child Behavior Checklist [10,11] and found more behavioral and emotional problems in transgender youth compared with the normative samples of these measures [12,13]. In general, comparisons made with normative samples drawn from the general population show similar findings, with a predominance of internalizing problems over externalizing problems (for an overview, see [14]). Summarizing the YSR and Child Behavior Checklist results, transgender adolescents show psychological problems comparable to clinical norm populations, with some cross-national variation in levels of psychological problems between North America and Europe [15,16].

A framework for understanding GD and the associated mental health disparities is offered by the minority stress model that posits that sexual minorities experience chronic stressors related to the stigmatization of their identities [17,18]. Psychological functioning is better when there is more acceptance of GD by the youth and their environment, including better peer relations [12,16]. In addition, other more general risk factors might be related, and other models of explanations have been proposed [14]. In addition, the onset of puberty and the developing body might endorse an intensification of psychological distress [19].

Transgender care for adolescents with GD is often offered in a step-wise model. During the first phase, the nature of the adolescent's gender identity and general psychosocial functioning are explored, and medical interventions are not yet provided [19]. During the second phase, adolescents with GD receive puberty suppression by means of reversible gonadotropin-releasing hormone analogs to "create time" to enable further exploration of the decision for gender-affirming treatments without the accompanying distress caused by the physical changes of puberty [19]. Thereafter, gender-affirming hormones (GAHs) can be provided, androgens in assigned girls at birth and estrogens in assigned boys at birth to induce the development of secondary sex characteristics of the experienced gender [19–21]. The present article will refer to assigned boys or girls when assigned gender at birth is boy or girl, respectively, which may be incongruent from the experienced gender in the group of adolescents with GD.

The first follow-up studies evaluating the use of puberty suppression in relation to psychological well-being in adolescents with GD come from the Netherlands and showed that behavioral and emotional problems and depressive symptoms decreased and general functioning significantly improved during treatment [22,23]. A study from the United Kingdom showed that psychological support and puberty suppression were associated with an improved global psychosocial functioning in adolescents with GD with a combination of psychological support and puberty suppression, attributing to a greater improvement than psychological support only [24]. These psychological evaluation studies were performed using self-reported psychosocial functioning (internalizing and externalizing problems, suicidality, and peer relations) in comparison with normative standardization samples. The YSR normative sample was recruited over 20 years ago, and a more recent recruited sample from the general population is lacking [11]. The present study is the first to compare transgender adolescents receiving gender-affirmative treatment by means of puberty suppression with recently collected nonclinical cisgender peers from the general population, exploring psychological functioning and the role of specialized transgender care.

Methods

Participants and procedure

The samples in this study consisted of consecutive referrals to the Center of Expertise on Gender Dysphoria of the VU University Medical Center (VUmc) in Amsterdam, the Netherlands, between 2012 and 2015, and a control group of cisgender adolescents recruited in 2015 in the general population. During this period, 504 adolescents were seen in our gender identity service. Fifty-three participants did not complete the assessment process and did, therefore, not participate in this study. The reason for dropout was failure to complete the questionnaire or alternation of symptoms of GD. Of the adolescents diagnosed with GD, 179 were about to start GAH treatment. One participant did not complete the questionnaire and was thus excluded.

Therefore, in this cross-sectional study, the three groups that were compared consisted of (1) adolescents who just started the assessment process (n = 272; mean age = 14.5 years; 116 assigned boys at birth and 156 assigned girls at birth), (2) adolescents diagnosed with GD who were on puberty suppression and about to start GAH treatment (n = 178; mean age = 16.8 years; 68 assigned boys at birth and 110 assigned girls at birth), and (3) cisgender adolescents recruited from the general population (n = 651; mean age = 15.4 years; 346 assigned boys at birth and 305 assigned girls at birth). Adolescents who just started the diagnostic procedure were assessed during their first sessions at the VUmc. Adolescents diagnosed with GD were assessed before the start of GAH. During both assessments, parents and children completed several questionnaires [20].

Data from the comparison group of cisgender adolescents from the general population were recruited by means of the help of different secondary schools in different provinces in the Netherlands. After consent of the parents, the adolescents completed a paper-pencil survey during regular class times.

Measures

Key demographic variables that were collected included the adolescents' birth-assigned gender, age, ethnicity, level of education, and parent's marital status. The demographic characteristics of the three groups are shown in Table 1.

The Dutch version of the YSR was used to assess internalizing and externalizing problem behavior, self-harm/suicidality, and poor peer relations [11]. The YSR consists of a total of 118 items, rated on a 0- to 2-point scale: "never," "sometimes," or "often," asking adolescents about their emotional and behavioral problems during the previous 6 months. The YSR is well established with regard to reliability and validity and has acceptable reliability and adequate criterion and construct validity [11]. The YSR has one item specifically pertaining to GD: "wish to be of the opposite sex" (Item 110). In line with previous studies, this item was scored as 0 to avoid increased associations with psychological challenges and GD [25]. For internalizing and

Table 1
General characteristics for transgender adolescents and the general population sample

Variable	General population (n = 651)	Transgender at referral (n = 272)	Transgender using puberty suppression (n = 178)
Age (in years)			
Mean (SD)	15.39 (1.36)	14.47 (2.18)	16.75 (1.24)
Ethnicity, n (%)			
Dutch	580 (89.1)	185 (68)	131 (73.6)
Non-Dutch	67 (10.3)	30 (11)	16 (9)
Unknown	4 (.6)	57 (21)	31 (17.4)
Level of education, n (%)			
VMBO	99 (15.2)	203 (74.3)	126 (70.6)
HAVO	274 (42.1)	29 (10.8)	29 (16.4)
VWO	278 (42.7)	40 (14.9)	23 (13)
Parent's marital status, n (%)			
Both parents	520 (79.9)	153 (56.3)	103 (57.9)
Other	129 (19.8)	116 (42.6)	74 (41.6)
Unknown	2 (.3)	3 (1.1)	1 (.6)

HAVO = higher general continued education; SD = standard deviation; VMBO = prevocational education; VWO = preparatory scholarly education.

externalizing problems, mean scale scores and clinical range percentages (>90th percentile in nonreferred samples) were calculated. To assess peer relations, and following the procedure as done in previous studies [25], a Peer Relations scale was created from three YSR items: "I don't get along with other kids" (Item 25), "I get teased a lot" (Item 38), and "I am not liked by other kids" (Item 48). Self-harm/suicidality was examined by two YSR items, namely, "I deliberately try to hurt or kill myself" (Item 18) and "I think about killing myself" (Item 91) as metrics of suicidality.

Analyses

First, multivariate general linear modeling (GLM) analysis was used to analyze between-group differences for internalizing, externalizing, suicidality, and peer relations together. Second, a multivariate GLM analysis with assigned gender at birth and a gender by group interaction as additional predictors was used to identify possible gender differences. These analyses were followed by univariate GLM analyses with Bonferroni correction to correct for multiple comparisons. Third, multivariate GLM analyses with group and assigned gender at birth as predictors and age, ethnicity, level of education, and parent's marital status as covariates were performed. Fourth, Cohen's *d* was used to measure the effect sizes between the groups [26]. Finally, clinical range percentages were calculated for internalizing and externalizing.

Results

Mean scores for internalizing, externalizing, suicidality, and peer relations

Table 2 shows the mean scores for internalizing, externalizing, suicidality, and peer relations per sample. On average, the scores of the transgender adolescents who have just been referred on internalizing, suicidality, and peer relations were higher than the scores of the transgender adolescents using puberty suppression and the cisgender comparison group, respectively. A multivariate GLM analysis with group as a fixed factor and the internalizing, externalizing, suicidality, and poor peer relations as the dependent measures showed an overall difference using Pillai's trace ($F = 707.61$, $df = 4$; $p < .001$). Subsequent analyses for the internalizing, externalizing, suicidality, and poor peer relations indicated that groups differed from each other on internalizing, suicidality, and poor peer relations (all three univariate p values $< .001$) but not on externalizing ($p = .709$).

Post hoc analyses

Post hoc analyses showed that transgender adolescents who just have been referred had significantly higher scores on internalizing, suicidality, and peer relations compared with the cisgender comparison group and transgender adolescents using puberty suppression. In addition, the transgender adolescents using puberty suppression scored significantly lower on internalizing problems but higher on peer relations compared with the comparison group. No differences were found between adolescents using puberty suppression and the comparison group on self-harm/suicidality (Table 2 provides all effect sizes).

Gender differences

When we added assigned gender at birth as a predictor, we confirmed the main effect of group ($F = 686.47$, $df = 4$; $p < .001$), and the previously mentioned univariate group effects for internalizing, suicidality, and peer relations were also confirmed (all $p < .001$). In addition, we found a main effect for gender ($F = 14.22$, $df = 4$; $p < .001$) and a group by gender interaction effect ($F = 9.52$, $df = 8$; $p < .001$). Subsequent univariate analysis found an effect for gender and an interaction effect on internalizing and peer relations. Within-group post hoc t tests revealed that the interaction arose on internalizing because in the cisgender comparison group, assigned girls at birth had higher mean scores than assigned boys at birth, whereas in both the transgender groups, no differences were found in internalizing scores between assigned girls and assigned boys at birth. On the peer relations, the interaction arose because in both transgender groups, assigned boys at birth had higher scores, whereas in the cisgender comparison group, assigned girls at birth had higher scores. Table 3 provides mean scores by assigned gender at birth. In addition, as for the demographic variables age, ethnicity, level of education, and parent's marital status statistical group differences were found, all analyses were repeated with these variables as covariates and showed similar findings.

Table 2
Mean scores on the Youth Self-Report for internalizing, externalizing, peer relations, and suicidality problems for transgender adolescents and the general population sample

Measures[c]	General population (n = 651)		Transgender at referral (n = 272)		Transgender using puberty suppression (n = 178)		Statistical analysis[a]		Effect sizes Cohen's *d*[b]		
	Mean	SD	Mean	SD	Mean	SD	F[d]	*p* values	GP versus T0[e]	GP versus T1[e]	T0 versus T1[e]
Internalizing	9.71	7.73	11.67	8.38	7.76	6.68	14.16	**<.001**	−.24	.30	.52
Externalizing	10.25	6.10	10.19	6.33	9.82	5.79	.34	.709	.01	.07	.06
Peer relations	.41	.81	1.08	1.31	.70	1.06	12.58	**<.001**	−.62	−.31	.32
Suicidality	.19	.60	.41	.78	.17	.52	44.26	**<.001**	−.32	.04	.36

SD = standard deviation.
[a] Additional post hoc analyses comparing the transgender group at referral, the transgender group using puberty blockers, and the general population sample, demonstrated that on internalizing, peer relations, and suicidality, the adolescents at referral had significantly higher scores than the adolescents using suppression and the adolescents from the general population. In addition, the adolescents using puberty suppression scored significantly lower on internalizing but significantly higher on peer relations compared with the general population sample.
[b] Effect sizes Cohen's *d*: .80 or higher is a large effect size, .50–.79 a medium effect size, .20–.49 small, and effect sizes <.20 are negligible [26].
[c] Internalizing problems = disturbances of emotions (e.g., depression, anxiety; absolute range: 0–62); externalizing problems = behavioral excess or disturbances of conduct (e.g., aggression, hyperactivity; absolute range: 0–64); peer relations = problems with relations with peers (absolute range: 0–6); suicidality = thinking about or attempting suicide (absolute range: 0–4) [11].
[d] $df = 2$.
[e] GP = sample of cisgender adolescents from the general population; T0 = sample of transgender adolescents referred to transgender affirmative care who did not receive any medical treatment; T1 = transgender adolescents receiving affirmative care consisting of puberty suppression.

Finally, four (internalizing, externalizing, poor peer relations, and self-harm/suicidality) between-group analyses for each assigned gender at birth were performed using Bonferroni correction. These analyses showed that of the four between group comparisons for assigned boys at birth at referral with cisgender boys, significant higher scores were found for internalizing ($d = -.66$), peer relations ($d = -.92$), and self-harm/suicidality ($d = -.63$) for the assigned boys who just started the assessment. Assigned girls at birth who just started the assessment only scored significantly higher than the cisgender girls on peer relations ($d = -.36$). The three other scales were not significantly different.

In the transgender adolescent sample using puberty suppression, the assigned boys at birth scored only higher on peer relations ($d = -.53$) but not on the three other scales compared with the cisgender boys. For the assigned girls at birth using puberty suppression compared with the cisgender girls, the scores on internalizing were found to be significantly lower ($d = .63$). No other significant differences were found.

Of the four scale comparisons for assigned boys at birth at referral with the assigned boys at birth using puberty suppression, significant lower scores were found for those using puberty suppression on internalizing ($d = .54$), peer relations ($d = .41$), and self-harm/suicidality ($d = .37$). For the comparisons between the assigned girls at referral with the assigned girls using puberty suppression, significant lower scores were found for those using puberty suppression on internalizing ($d = .50$) and self-harm/suicidality ($d = .35$).

Clinical range percentages

Of the transgender adolescents just referred to the clinic, 31.3% had clinical range scores for internalizing problems (assigned boys at birth: 35.3% and assigned girls at birth: 28.2%), and 17.3% (assigned boys at birth: 6.0% and assigned girls at birth: 25.6%) had those for externalizing compared with 22.9% (assigned boys at birth: 13.0% and assigned girls at birth: 34.1%) and 13.8% (assigned boys at birth: 11.3% and assigned girls at birth: 16.7%) of the cisgender comparison sample. For the transgender adolescents using puberty suppression, the percentages were 16.3% for internalizing (assigned boys at birth: 16.2% and assigned girls at birth: 16.4%) and 14.0% for externalizing (assigned boys at birth: 8.8% and assigned girls at birth:17.3%).

Table 3
Mean scores on the Youth Self-Report by gender assigned at birth for internalizing, externalizing, peer relations, and suicidality for transgender adolescents and the general population sample

Measures[a]	General population					Transgender at referral					Transgender using puberty suppression				
	Assigned boys (n = 346)		Assigned girls (n = 305)		Effect sizes Cohen's *d*[b]	Assigned boys (n = 116)		Assigned girls (n = 156)		Effect sizes Cohen's *d*[b]	Assigned boys (n = 68)		Assigned girls (n = 110)		Effect sizes Cohen's *d*[b]
	Mean	SD	Mean	SD		Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Internalizing	7.21	5.89	12.54	8.55	−.73	11.74	7.74	11.62	8.84	.01	7.79	6.76	7.74	6.66	.01
Externalizing	10.90	5.91	9.50	6.24	.23	9.69	5.52	10.56	6.86	−.14	10.32	6.26	9.51	5.31	.14
Peer relations	.38	.77	.45	.85	−.09	1.45	1.46	.81	1.11	.49	.91	1.18	.57	.95	.32
Suicidality	.12	.44	.27	.73	−.25	.39	.73	.42	.81	−.04	.16	.48	.18	.54	−.04

SD = standard deviation.
[a] Internalizing problems = disturbances of emotions (e.g., depression, anxiety; absolute range: 0–62); externalizing problems = behavioral excess or disturbances of conduct (e.g., aggression, hyperactivity; absolute range: 0–64); peer relations = problems with relations with peers (absolute range: 0–6); suicidality = thinking about or attempting suicide (absolute range: 0–4) [11].
[b] Within group effect size differences; Cohen's *d*: .80 or higher is a large effect size, .50–.79 a medium effect size, .20–.49 small, and <.20 is negligible [26].

Endorsement of self-harm/suicidality

In the sample of transgender adolescents at referral, 74 (27.2%) endorsed the metric of suicidality. In the sample of transgender adolescents using puberty suppression, this was n = 22 (12.4%). In the cisgender comparison group, the percentage was 11.9% (n = 77).

Discussion

Our study revealed that adolescents referred for gender-affirmative care have increased behavioral and emotional problems, especially internalizing problems, reported increased self-harm/suicidality, and poorer peer relations compared with cisgender adolescents from the general population. This finding, including the clinical range percentage for internalizing problems, is in line with the current literature that in general, transgender adolescents are at risk for mental health problems [3–8]. However, our study also showed that transgender adolescents receiving gender-affirmative care involving puberty suppressing treatment not only have less emotional and behavior problems than transgender adolescents who have just been referred to gender-affirmative care but also reported similar rates of mental health problems as their nonclinical cisgender peers on internalizing problems (with a lower clinical range percentage) and self-harm/suicidality but not on peer relation problems. This second finding of less internalizing problems and self-harm/suicidality is also in line with previous follow-up studies on transgender adolescents [22,23], providing further evidence that transgender adolescents could benefit from gender-affirmative care.

With regard to gender differences, we found that in both the transgender samples, assigned boys at birth scored higher on internalizing than assigned girls at birth, which is contrary to general population adolescents' mean scores but in line with previous findings [12]. For externalizing, and also in contrast with general population mean scores, assigned girls at birth who have just been referred but not assigned girls at birth on puberty suppression scored somewhat higher than assigned boys at birth with GD. These findings are partly in line with the hypothesis that the sex-typical pattern of more internalizing problems in girls and more externalizing problems in boys in the cisgender population might be inversed in transgender people [12]. This hypothesis deserves more research.

A clinical implication of these findings is the need for worldwide availability of gender-affirmative care, including puberty suppression for transgender adolescents to alleviate mental health problems of transgender adolescents. It should be acknowledged that the care provided in the present study also involved the offering of appropriate mental health care. Thus, transgender care providers need to actively screen for mental health problems and offer this care. In addition, clinicians should receive special training to provide this care, for example, to become more experienced in disentangling psychological problems stemming from bullying related to GD or having other origins. Our study found that transgender adolescents using puberty suppression consider their peer relations better than adolescents at referral but still reported more challenges with peers than the cisgender adolescents. As it has been established in different studies that stigmatization and peer victimization seem to be common for transgender people [27], and psychological problems are correlated with peer support [28], clinicians should also take the importance of peer support during the transition into account.

Although the treatment with puberty suppression for adolescents with GD is now available in an increasing number of countries, the small amount of scientific evidence of the medical safety and efficacy and the psychological efficacy comes from a limited number of studies, mostly performed in the Netherlands [22]. It should, therefore, additionally be stressed that the gender-affirmative treatment described in the Dutch protocol is a highly protocolled treatment with regard to eligibility criteria and psychological support, including affirmative psychoeducation of GD for youth and parents or caregivers and the continued discussion of psychosexual development with themes such as school and friendships but also dating and romantic relationships [29]. This does imply that the findings of our study might not apply to all transgender adolescents, as, for example, in other health care systems, psychological support is incomparable to the psychological support received following the Dutch protocol [29]. More research is needed to see whether our findings of effective affirmative care involving puberty suppression improving the mental health of transgender adolescents is generalizable to other countries.

In addition, the results of this study should be seen in the light of three limitations. First, this study did not make use of a random nonclinical national probability sample. However, although the mean scores in this study of the general population comparison sample were consistent with the findings of the YSR standardization sample used in other studies in the Dutch population [11,22], the generalizability of our findings might not be corroborated. Second, although the YSR is a well-validated questionnaire for behavioral and emotional challenges [11], it cannot be equated with a diagnosis of any mental health condition made by clinical assessment. Third and most important, although those individuals with and without a GD diagnosis after assessment did not differ in internalizing, externalizing, peer relations, and suicidality scores at baseline in the group that has just been referred to the clinic, the cross-sectional design of this study with different participants in the groups before and after puberty suppression may potentially limit the results with participants being different on characteristics not measured and controlled for. The present study can, therefore, not provide evidence about the direct benefits of puberty suppression over time and long-term mental health outcomes. Conclusions about long-term benefits of puberty suppression should thus be made with extreme caution needing prospective long-term follow-up studies with a repeated measure design with individuals being followed over time to confirm the current findings.

Future studies should, therefore, not only investigate the benefit of gender-affirmative care in other health care settings together with a matched nonclinical general population sample but should also make comparisons to transgender adolescents receiving GAH treatment and gender-affirming surgery to investigate the impact of these treatments on long-term mental health. As this study did not ask specifically for the increasingly recognized nonbinary identities [30], future studies should also cover if nonbinary transgender adolescents might equally benefit from this type of gender-affirmative care. Despite the previously mentioned limitations, this first study comparing a group of transgender adolescents just referred for gender-affirmative care, a group of transgender adolescents receiving treatment with puberty suppression, and a group of cisgender adolescents

from the general population showed that when affirmative care involving puberty suppression is provided, transgender adolescents may have comparable mental health levels to their cisgender peers. This type of gender-affirmative care seems thus extremely important for this group.

Acknowledgments

None.

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