Journal of Adolescent Health xxx (2021) 1–7

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Original article

Association of Gender-Affirming Hormone Therapy With Depression, Thoughts of Suicide, and Attempted Suicide Among Transgender and Nonbinary Youth

Amy E. Green, Ph.D. *, Jonah P. DeChants, Ph.D., Myeshia N. Price, Ph.D., and Carrie K. Davis, M.S.W.

The Trevor Project, West Hollywood, California

Article history: Received July 26, 2021; Accepted October 28, 2021
Keywords: Transgender; Nonbinary; Gender-affirming care; Suicide; Depression; LGBTQ

A B S T R A C T

Purpose: There are no large-scale studies examining mental health among transgender and nonbinary youth who receive gender-affirming hormone therapy (GAHT). The purpose of this study is to examine associations among access to GAHT with depression, thoughts of suicide, and attempted suicide among a large sample of transgender and nonbinary youth.
Methods: Data were collected as part of a 2020 survey of 34,759 lesbian, gay, bisexual, transgender, queer, and questioning youth aged 13–24, including 11,914 transgender or nonbinary youth. Adjusted logistic regression assessed whether receipt of GAHT was associated with lower levels of depression, thoughts of suicide, and attempted suicide among those who wanted to receive GAHT.
Results: Half of transgender and nonbinary youth said they were not using GAHT but would like to, 36% were not interested in receiving GAHT, and 14% were receiving GAHT. Parent support for their child's gender identity had a strong relationship with receipt of GAHT, with nearly 80% of those who received GAHT reporting they had at least one parent who supported their gender identity. Use of GAHT was associated with lower odds of recent depression (adjusted odds ratio [aOR] = .73, $p < .001$) and seriously considering suicide (aOR = .74, $p < .001$) compared to those who wanted GAHT but did not receive it. For youth under age 18, GAHT was associated with lower odds of recent depression (aOR = .61, $p < .01$) and of a past-year suicide attempt (aOR = .62, $p < .05$).
Conclusions: Findings support a relationship between access to GAHT and lower rates of depression and suicidality among transgender and nonbinary youth.

IMPLICATIONS AND CONTRIBUTION

Transgender and nonbinary youth have high risk of depression and suicide. Gender-affirming healthcare is associated with lower risk using adult samples. This large-scale study examines GAHT among transgender and nonbinary youth. Findings demonstrate that GAHT is significantly related to lower rates of depression and suicidality among transgender and nonbinary youth.

Transgender and nonbinary youth are at elevated risk for depression, thoughts of suicide, and attempted suicide compared to youth who are cisgender and heterosexual, as well as cisgender members of the lesbian, gay, bisexual, transgender, queer, and questioning (LGBTQ) community [1–3]. Mental health disparities among transgender and nonbinary youth stem from minority stress based on the harmful ways transgender and nonbinary youth are treated by others [4]. Feelings of gender dysphoria associated with incongruence between one's physical traits and gender identity are also associated with mental health challenges for transgender and nonbinary youth [5]. As such, both the treatment of gender dysphoria and the reduction of minority stress offer pathways toward reducing disparities in depression and suicidality found among transgender and nonbinary youth.

Conflicts of interest: The authors have no conflicts of interest relevant to this article to disclose.

* Address correspondence to: Amy E. Green, Ph.D., The Trevor Project, PO Box 69232, West Hollywood, CA 90069.
E-mail address: Amy.Green@TheTrevorProject.org (A.E. Green).

https://doi.org/10.1016/j.jadohealth.2021.10.036

The Minority Stress Model details how chronic stressful events such as gender identity–based stigma and rejection produce proximal processes such as internalized stigma and shame, which result in mental health challenges [6]. Although minority stress is associated with greater risk of anxiety, depression, and suicidality among transgender and nonbinary individuals [2,5], gender-affirming medical care has been associated with lower risk [7,8]. Gender-affirming medical care is one component of the larger process of gender affirmation, which may include social, legal, and medical changes. Social transition is the primary and most common component of gender affirmation for prepubertal youth and involves allowing them to present in the way that feels most authentic to them. Medical-affirming care can include treatments that postpone physical changes associated with puberty, as well as treatments that lead to changes that would affirm one's gender identity. Gonadotropin-releasing hormone analogs, commonly known as "puberty blockers," are used to delay the onset of puberty, while gender-affirming hormone therapy (GAHT) is used to promote gender-affirming physical changes. GAHT allows transgender and nonbinary youth to develop physical characteristics that align with their gender identity and is appropriate for those who have begun puberty or following the use of puberty blockers. Access to GAHT is especially important during adolescence because some effects of puberty are not easily reversed by GAHT in adulthood (e.g., testosterone's effects on voice) [9]. Qualitative data highlight ways transgender individuals have experienced distress due to the delay in GAHT, which results in them undergoing puberty associated with their sex assigned at birth [10,11]. Access to GAHT is an ongoing issue for transgender youth and their families, both due to a lack of competent providers in many communities and due to recent legislative efforts to criminalize medical providers and parents who provide GAHT to youth under the age of 18 [12,13]. Barriers to care are often greater for transgender and nonbinary youth of color who are unrepresented in gender specialty clinics and have more difficulties accessing gender-affirming care compared to White transgender and nonbinary youth [9].

A recent study based on the 2015 U.S. Transgender Survey found that transgender adults who received pubertal blockers as adolescents had significantly lower lifetime suicidal ideation compared to those who desired but did not receive it [8]. However, thus far, there are no large-scale studies comparing mental health and suicidality among transgender and nonbinary youth who wanted GAHT and received it to those who wanted it but did not receive it [14]. Three small clinical studies have examined GAHT in relation to mental health and suicidality among transgender and nonbinary youth. However, these clinical studies were not able to randomize youth to receive GAHT or include a control group. The first study followed 47 transgender youth and found that mean levels of suicidality significantly decreased from 1.11 before starting GAHT to .27 when assessed approximately 1 year after beginning GAHT [7]. The second study of 128 transgender youth found small to moderate improvements in self-reported depressive symptoms ($d = .44$) [15]. The third study examined 50 transgender youth at two 6-month intervals following the start of GAHT and found significant decreases in depression as measured by the Center for Epidemiologic Studies Depression Scale [16]. Each of these studies noted limitations related to not being able to control for the role of parental support, as each youth had at least one parent who supported their receipt of GAHT.

The present study draws from a large sample of transgender and nonbinary youth between the ages of 13–24 to examine the association between receipt of GAHT with self-reported depression, thoughts of suicide, and attempted suicide. Furthermore, because many current concerns around GAHT relate to their use in youth under the age of 18, these associations will also be examined separately for those under age 18.

Methods

Procedure

Data were from an online nonprobability sample collected between October and December 2020 of 34,759 youth aged 13–24 who resided in the U.S. and identified as LGBTQ. Youth were recruited via targeted ads on Facebook, Instagram, and Snapchat. Those who reported residing outside of the U.S., having an age below 13 or above 24, or being both heterosexual and cisgender were excluded from the sample. To approach a more representative sample, targeted recruitment was conducted to ensure adequate sample sizes with respect to geography and race/ethnicity. Qualified respondents completed a secure online questionnaire that included a maximum of 142 questions. The survey employed two validity checks. The first was an item that required youth to select a specific response from the provided list. The second validity check screened for youth who responded inconsistently to the same item placed at two separate points in the survey. Each question related to mental health and suicidality was preceded by a message stating: "If at any time you need to talk to someone about your mental health or thoughts of suicide, please call The Trevor Project at 1-866-488-7386." Youth were able to select "decline to answer" for any questions in the survey that they did not want to answer. Respondents were eligible to be entered into a drawing for one of 100 gift cards worth $50 each by providing their email address after being routed to a separate survey. The research proposal was reviewed and approved by an independent Institutional Review Board, Solutions IRB. Youth participation was voluntary, and informed consent was obtained. We obtained a waiver of parental consent for youth aged 13–17 years as the research posed a minimal risk and could have presented potential harm for youth who were not out to their parents about their LGBTQ identity. No names or personal details were included to ensure confidentiality and privacy.

Measures

Gender-affirming hormone therapy use. Youth who indicated they were transgender or nonbinary were asked, "Are you currently taking gender-affirming hormones?" with response options that included, (1) "No, and I do not want to take them," (2) "No, but I would like to take them," and (3) "Yes." In logistic regression analyses, youth responses are coded as (0) "No, but I would like to take them" and (1) "Yes."

Depression. Current levels of depression were measured using the Patient Health Questionnaire-2 [17]. The Patient Health Questionnaire-2 was designed as a two-item screening tool for major depressive disorder in the past 2 weeks. Scores were dichotomized based on recommended guidelines for a total score of three or more being indicative of depression.

Suicidal thoughts and behaviors. Youth were first presented with a question on whether they had seriously considered suicide in the past year. Those that answered, "yes" were subsequently asked how many times they had attempted suicide in the past year, with answers dichotomized into zero compared to one or more attempts. Both items are from the Centers for Disease Control and Prevention's Youth Risk Behavior Survey [18].

Demographic covariates. The following sociodemographic covariates were examined based on their potential relationships with suicidality and access to GAHT: age, socioeconomic status (just able to meet basic needs or less, more than able to meet basic needs), race (Alaska Native/American Indian, Asian/Pacific Islander, Black/African American, Latinx, multiracial, or White), and census region (Northeast, South, Midwest, West). Gender identity was measured using a two-stage question that first asked, "What sex were youth assigned at birth, on your original birth certificate," with response options of male or female. The second question asked, "Which of the following terms best describes your gender identity. We understand that there are many different ways youth identify, please pick the one that best describes you," with response options of boy/man, girl/woman, and nonbinary/genderfluid/gender nonconforming, as well as options to indicate the youth did not understand the question or were not sure of their gender identity. For those who indicated a known gender identity, the measures were combined to create categories of transgender girl/woman, transgender boy/man, and nonbinary. A single item was used to measure sexual orientation stating, "Which of these options best describes your sexual orientation. We understand that there are many different sexual identities please pick the one that best describes you," with response options of gay, lesbian, bisexual, pansexual, queer, questioning, or straight/heterosexual [19].

Additional covariates. Four additional covariates were included based on their potential relationships with both access to GAHT and risk of depression and suicidality among transgender and nonbinary youth. Parent support for a youth's gender identity was assessed by asking youth, "Do you have at least one parent who is supportive of your gender identity?" with answers of (1) "No," (2) "Yes," and (3) "I am not 'out' about my gender to any of my parents." Youth's report of victimization based on their gender identity was assessed by asking, "Have you ever felt physically threatened or been physically abused because of your gender identity?" Response options were (0) "No" and (1) "Yes." Receipt of puberty blockers was assessed by an item placed immediately prior to the question on GAHT that asked, "Did you take medication designed to prevent or delay puberty (also known as puberty blockers)?" Response options were codes as (0) "No" and (1) "Yes." Exposure to gender identity conversion efforts (GICE) was assessed by asking, "Did you ever receive treatment from someone who tried to change your sexual orientation or gender identity (such as trying to make you straight or cisgender)?" Youth who did not undergo conversion efforts or who reported that they underwent conversion efforts related to only their sexual orientation were coded as (0) "No," while youth who reported undergoing GICE were coded as (1) "Yes."

Data analysis

SPSS version 28 was used in conducting all analyses [20]. Chi-squared tests of independence were used to examine the proportion of young people who used GAHT compared to those who wanted GAHT but did not receive it. A *t*-test was used to examine mean age differences. After adjustment for the aforementioned covariates, logistic regression was used to determine the odds of depression, past-year thoughts of suicide, and a past-year suicide attempt among those who received GAHT in comparison with those who wanted GAHT but did not receive it. To address the lack of research focused on gender-affirming medical care among transgender and nonbinary youth who are minors, analyses were also conducted separately among youth aged 13–17.

Participants

A total of 11,914 youth from unique IP address indicated that they were transgender or nonbinary. Our question on GAHT was placed toward the end of the survey, and as such 2,895 youth had missing data. Chi-squared tests of independence were used to compare the 9,019 youth who had GAHT data to the 2,895 who did not. There were no significant differences within sexual identity, socioeconomic status, census region, gender identity support from parents, gender identity-based victimization, or GICE. The proportion of transgender boys/men and nonbinary youth were comparable. There were slightly higher rates of transgender women in the sample with data on GAHT compared to those with missing data (8% vs. 6%, $\chi^2(2) = 13.21$, $p = .001$). The sample with data on GAHT had higher rates of multiracial youth (21% vs. 17%) and lower rates of White youth (55% vs. 60%) ($\chi^2(5) = 34.32$, $p < .001$). Age was examined using *t*-test analyses with the average age of the subset of youth with data on GAHT slightly greater (17.62) than those without it (17.30), $t(11{,}912 = 4.60)$, $p < .001$.

Results

The majority of youth were nonbinary (63%), followed by transgender boy/man (29%) and transgender girl/woman (8%). The average age was 17.62 (standard deviation = 3.21), and 27% reported that they were either just able to financially meet basic needs or struggled to meet basic needs. Most youth resided in the South (36%), followed by West (27%), Midwest (22%), and Northeast (15%). Overall, 29% identified as bisexual, 26% as pansexual, 20% as gay or lesbian, 20% as queer, 4% as questioning, and 2% as heterosexual. The majority of the sample was non-Hispanic White (55%), followed by multiracial (21%), Latinx (12%), Asian/Pacific Islander (5%), Black (4%), and American Indian/Alaskan Native (2%).

Half of transgender and nonbinary respondents said they were not using GAHT but would like to receive it, 36% said they were not interested in receiving GAHT, and 14% said they were receiving GAHT. In bivariate analyses (Table 1), those who received GAHT were on average older, and a greater proportion reported that they struggled to meet basic needs or were just able to meet them, compared to those who wanted GAHT but did not receive it. Those who lived in the South were underrepresented among those who received GAHT when they desired it. Transgender girls/women and transgender boys/men were represented in greater proportions among those who received GAHT, while a greater proportion of those who were nonbinary reported wanting GAHT but not receiving it. White youth were the only race/ethnicity group that were represented in a greater proportion among those who received GAHT compared to those who wanted it but did not receive it. Transgender and nonbinary

Table 1
Sample characteristics of transgender and nonbinary youth aged 13–24 based on receipt of GAHT

	Received GAHT (n = 1,216) Mean (SD) or % (n)	Wanted but did not receive GAHT (n = 4,537) Mean (SD) or % (n)	
Age	19.95 (2.80)	16.91 (2.97)	$t(15{,}751) = 33.26$, $p < .001$
Socioeconomic status			$\chi^2(1) = 17.11$, $p < .001$
More than meets basic needs	67.3 (794)	73.5 (2,947)	
Just meets basic needs or less	32.7 (385)	26.5 (1,063)	
Census region			$\chi^2(3) = 32.25$, $p < .001$
Northeast	17.2 (209)	14.0 (634)	
South	28.7 (349)	36.9 (1,676)	
Midwest	23.4 (285)	22.8 (1,035)	
West	30.7 (373)	26.3 (1,192)	
Gender identity			$\chi^2(2) = 374.88$, $p < .001$
Nonbinary	21.3 (259)	49.5 (2,245)	
Transgender boy/man	55.3 (673)	41.3 (1,874)	
Transgender girl/woman	23.4 (284)	9.2 (418)	
Sexual identity			$\chi^2(5) = 113.49$, $p < .001$
Gay/lesbian	25.6 (310)	17.9 (807)	
Heterosexual	4.5 (53)	1.8 (80)	
Bisexual	30.5 (369)	29.4 (1,325)	
Pansexual	16.4 (198)	27.8 (1,250)	
Queer	20.2 (244)	19.0 (845)	
Questioning	2.9 (35)	4.4 (196)	
Race/ethnicity			$\chi^2(5) = 63.34$, $p < .001$
American Indian/Alaskan Native	1.4 (16)	2.2 (98)	
Asian/Pacific Islander	3.1 (36)	4.6 (202)	
Black	1.7 (20)	3.4 (150)	
Latinx	8.8 (104)	12.4 (543)	
White	68.3 (805)	55.8 (2,441)	
Multiracial	16.7 (197)	21.5 (940)	

GAHT = gender-affirming hormone therapy; SD = standard deviation.

youth who identified as gay, lesbian, or heterosexual were represented in higher proportions among those who received GAHT compared to those who wanted it but did not receive it. Pansexual youth were underrepresented among those who wanted GAHT but did not receive it. Table 2 presents the characteristics of transgender and nonbinary youth among the

Table 2
Sample characteristics of transgender and nonbinary youth aged 13–17 based on receipt of GAHT

	Received GAHT (n = 274) Mean (SD) or % (n)	Wanted but did not receive GAHT (n = 2,961) Mean (SD) or % (n)	
Age	16.00 (1.03)	15.09 (1.36)	$t(13{,}233) = 10.81$, $p < .001$
Socioeconomic status			$\chi^2(1) = 3.77$, $p = .05$
More than meets basic needs	86.3 (220)	81.3 (2,019)	
Just meets basic needs or less	13.7 (35)	18.7 (463)	
Census region			$\chi^2(3) = 14.50$, $p < .01$
Northeast	14.6 (40)	13.7 (405)	
South	26.3 (72)	37.4 (1,107)	
Midwest	24.8 (68)	22.0 (652)	
West	34.3 (94)	26.9 (797)	
Gender identity			$\chi^2(2) = 100.35$, $p < .001$
Nonbinary	15.3 (42)	46.7 (1,382)	
Transgender boy/man	74.8 (205)	46.5 (1,377)	
Transgender girl/woman	9.9 (27)	6.8 (202)	
Sexual identity			$\chi^2(5) = 52.85$, $p < .001$
Gay/lesbian	32.2 (88)	18.5 (544)	
Heterosexual	4.0 (11)	1.6 (46)	
Bisexual	33.0 (90)	31.3 (921)	
Pansexual	13.9 (38)	16.5 (486)	
Queer	13.6 (37)	27.0 (795)	
Questioning	3.3 (9)	5.0 (148)	
Race/ethnicity			$\chi^2(5) = 14.31$, $p = .01$
American Indian/Alaskan Native	1.9 (5)	2.5 (71)	
Asian/Pacific Islander	4.2 (11)	5.4 (152)	
Black	1.5 (4)	3.9 (111)	
Latinx	8.1 (21)	14.0 (396)	
White	58.8 (153)	50.2 (1,424)	
Multiracial	25.4 (66)	24.1 (683)	

GAHT-gender-affirming hormone therapy; SD = standard deviation.

Table 3
Challenges among transgender and nonbinary youth aged 13–24 based on receipt of GAHT

	Received GAHT (n = 1,216) % (n)	Wanted but did not receive GAHT (n = 4,537) % (n)	
Gender support from parents			$\chi^2(2) = 695.98$, $p < .001$
No	17.6 (210)	33.6 (1,451)	
Yes	79.8 (955)	38.2 (1,648)	
Not "out" to parents	2.6 (31)	28.2 (1,218)	
Gender identity-based victimization	61.9 (734)	49.2 (2,125)	$\chi^2(1) = 59.56$, $p < .001$
Gender identity conversion efforts	14.7 (172)	13.9 (581)	$\chi^2(1) = 0.42$, $p = .52$
History of puberty blocker use	11.0 (1,196)	1.0 (44)	$\chi^2(1) = 315.80$, $p < .001$
Depression	60.8 (738)	75.0 (3,385)	$\chi^2(1) = 95.38$, $p < .001$
Seriously considered suicide	43.9 (521)	57.1 (2,409)	$\chi^2(1) = 65.89$, $p < .001$
Attempted suicide	14.6 (173)	23.2 (956)	$\chi^2(1) = 40.24$, $p < .001$

GAHT = gender-affirming hormone therapy.

subsample aged 13–17 based on whether they were able to obtain desired GAHT.

Those who had parental support for their gender identity comprised nearly 80% of youth who received GAHT. Among those who wanted GAHT but did not receive it, 38% had parental support (Table 3). Among those who received GAHT, 11% reported that they had ever used puberty blockers compared to only 1% of those who wanted GAHT but did not receive it. Less than 1% (.6%) of youth who reported not wanting GAHT had ever used puberty blockers. A higher percentage of youth who received GAHT experienced gender identity–based victimization compared to those who wanted GAHT but did not receive it. In bivariate analysis, a smaller percentage of transgender and nonbinary youth who received GAHT reported recent depression (61% vs. 75%), seriously considering suicide in the past year (44% vs. 57%) and attempting suicide in the past year (15% vs. 23%) compared to those who wanted GAHT but did not receive it. Similar patterns emerged among youth aged 13–17 compared to the full sample (Table 4); however, 94% of those 13–17 who received GAHT had parental support compared to 80% among the full sample. Additionally, a larger proportion of those aged 13–17 who received GAHT had used puberty blockers (24%) compared to the overall sample (11%).

In adjusted logistic regression models (Table 5), receipt of GAHT was associated with lower odds of recent depression (adjusted odds ratio [aOR] = .73, $p < .001$) and seriously considering suicide in the past year (aOR = .74, $p < .001$). The aOR for attempted suicide among the overall sample of transgender and nonbinary youth aged 13–24 did not reach statistical significance (aOR = .84, $p = .16$). Among those aged 13–17, receipt of GAHT was associated with nearly 40% lower odds of recent depression (aOR = .61, $p < .01$) and attempting suicide in the past year (aOR = .62, $p < .05$). For youth under age 18, the aOR for seriously considering suicide in the past year did not reach statistical significance (aOR = .74, $p = .08$).

Discussion

These findings extend previous cross-sectional research conducted with transgender and nonbinary adults and provide support for a significant relationship between access to GAHT and lower depression and suicidality among transgender and nonbinary youth. Among the full sample and those under age 18, receipt of GAHT was associated with significantly lower odds of experiencing symptoms of depression in the previous 2 weeks. Although our study is not able to determine temporal patterns, it is unlikely that many transgender and nonbinary youth began GAHT subsequent to this 2-week time frame. The pattern of statistical significance for findings related to past-year suicidality was less consistent, which may indicate challenges related to statistical power when examining fairly infrequent outcomes such as suicidal thoughts and behaviors, particularly among smaller subgroups of individuals [21]. However, overall, our results indicate significant relationships between receipt of GAHT and lower suicidality among transgender and nonbinary youth.

Bivariate findings point to disparities in receipt of GAHT among subgroups of transgender and nonbinary youth. In particular, transgender and nonbinary youth living in the South had lower rates of accessing GAHT when they wanted it. This is also the region where the majority of bills to restrict access to gender-affirming care for transgender youth have been introduced subsequent to the collection of these data [22]. Overall youth who were able to

Table 4
Challenges among transgender and nonbinary youth aged 13–17 based on receipt of GAHT

	Received GAHT (n = 274) % (n)	Wanted but did not receive GAHT (n = 2,961) % (n)	
Gender support from parents			$\chi^2(2) = 323.26$, $p < .001$
No	3.7 (10)	33.3 (933)	
Yes	93.7 (254)	37.2 (1,043)	
Not "out" to parents	2.6 (7)	29.5 (825)	
Gender identity-based victimization	57.5 (734)	48.6 (2,125)	$\chi^2(1) = 7.66$, $p < .01$
Gender identity conversion efforts	13.1 (34)	13.6 (364)	$\chi^2(1) = 0.05$, $p = .82$
History of puberty blocker use	24.4 (66)	1.3 (37)	$\chi^2(1) = 422.86$, $p < .001$
Depression	60.9 (167)	77.9 (2,294)	$\chi^2(1) = 39.83$, $p < .001$
Seriously considered suicide	51.1 (135)	61.6 (1,674)	$\chi^2(1) = 10.97$, $p < .001$
Attempted suicide	16.0 (42)	27.7 (733)	$\chi^2(1) = 16.67$, $p < .001$

GAHT = gender-affirming hormone therapy.

Table 5
Multivariate adjusted logistic regression of gender-affirming hormone therapy on depression and suicidality among transgender and nonbinary youth

	Overall sample		Ages 13–17	
	aOR (95% CI)	*p*-value	aOR (95% CI)	*p*-value
Depression	0.73 (0.61–0.88)	<.001	0.61 (0.43–0.86)	<.01
Seriously considered suicide	0.74 (0.62–0.88)	<.001	0.74 (0.52–1.03)	.08
Attempted suicide	0.84 (0.66–1.07)	.16	0.62 (0.40–0.97)	.04

Adjusted for age, socioeconomic status, census region, gender identity, sexual orientation, race/ethnicity, parent support for gender identity, gender identity-based victimization, gender identity conversion efforts, and history of puberty blocker use.
aOR = adjusted odds ratio; CI = confidence interval.

access GAHT reported greater rates of financial struggles; however, this was not true for the subsample aged 13–17. Our measure of socioeconomic status was based on household finances, which often look different for those 18 and older who may no longer be able to rely on their family's resources. As expected, youth over age 18 had higher rates of being able to access GAHT when they desired it. Among transgender and nonbinary youth, those who primarily reported a binary identity (i.e., transgender man or transgender woman) had higher rates of accessing GAHT compared to those who were nonbinary. Pansexual youth were also underrepresented among those who received GAHT; however, this relationship may also be related to nonbinary identities as pansexual was the most frequently reported sexual orientation among nonbinary youth. There were also disparities in access to GAHT across race/ethnicity. White youth represented 68% of those who received GAHT compared to 56% among those who wanted it but did not receive it, with LGBTQ youth of color reporting lower rates of obtaining GAHT. Furthermore, parental support for their child's gender identity had a strong relationship with receipt of GAHT, with nearly 80% of those who received GAHT reporting they had at least one parent who supported their gender identity, including 94% of those aged 13–17. Together, these findings indicate that youth receipt of gender-affirming care is based not only on their presenting concerns but also on their parent's level of support, geography, and their social identities, which relate to barriers to care among the broader population of youth as well [23–26]. To reduce disparities in youth access to GAHT there is a need to focus on increasing awareness and education around gender-affirming care for parents as well as among healthcare providers and others in positions to support youth health and well-being.

Some of the hesitance regarding gender-affirming care for transgender and nonbinary youth may be due to a misunderstanding of the causes of mental health challenges in transgender and nonbinary individuals, such as a failure to recognize ways incongruence between physical traits and one's gender identity can produce psychological distress marked by depression. High rates of depression, suicidal ideation, and suicide attempts among transgender youth are sometimes used by antitransgender politicians and activists to erroneously suggest that transgender identity is a mental health condition that can be treated through counseling and conversion efforts [27]. These individuals ignore the impacts of gender dysphoria and minority stress [28] and suggest that GAHT is not necessary if transgender youth can be counseled into accepting their sex assigned at birth. The findings of this study demonstrate that GAHT could be a potential mechanism by which mental health and suicide disparities among transgender and nonbinary youth may begin to decrease. Furthermore, existing evidence suggests that regret is low for gender-affirming care interventions, with one study of 55 transgender adults who had received gender-affirming care as adolescents finding that not one experienced regret [29].

There remains a critical need for mental health outcomes data among transgender and nonbinary youth receiving GAHT, including through longitudinal studies. Large-scale longitudinal data collection will better elucidate the risks and benefits of individual treatment options so that youth and their families can make evidence-informed decisions regarding care.

Limitations

This study boasts a large, diverse sample of transgender and nonbinary youth across the U.S.; however, some limitations should also be noted. First, causation cannot be inferred due to the study's cross-sectional design. It is possible that those who historically have higher rates of depression and suicidal thoughts and behaviors are also less able to seek or obtain GAHT. However, combined with repeated measures designs of other studies [7,15] it appears likely that receipt of GAHT may lead to reduced levels of depression and suicidality. Given existing research, it is unlikely that randomized controlled trials of GAHT for youth would be ethically appropriate. To better understand directionality, prospective longitudinal designs are needed. Additionally, our self-reported nonprobability sample may limit the generalizability of findings and suggest the need for the inclusion of gender identity-specific measures in larger probability samples. Finally, our study did not include variables to assess at what age youth began puberty blockers or GAHT or the duration for which they had been receiving them. Because younger transgender and nonbinary youth in our sample may have been eligible for either puberty blockers or GAHT, there may have been youth who were currently receiving the puberty blockers and not yet ready to start GAHT. However, this is a small part of our sample as only 20 youth aged 13–14 indicated that they had taken puberty blockers but had not accessed desired GAHT. Data on age and duration of access should be included in future studies to better understand the relationship between GAHT and mental health.

Unfortunately, efforts to legally restrict gender-affirming care for transgender and nonbinary youth may negatively impact mental health through two separate but linked pathways. The first is by directly prohibiting medication that many of these youth rely on to reduce feelings of gender dysphoria. The second is by increasing minority stress through negative public attention and harmful rhetoric debating the rights of transgender and nonbinary youth to live their lives authentically. As such, efforts to address the mental health of transgender and nonbinary youth must also acknowledge and address the cumulative risk that antitransgender political statements and legislative efforts may have on their well-being.

As the evidence for gender-affirming care grows, medical and mental health organizations are increasingly expressing support for it. Many major medical and mental health organizations have guidelines for working with transgender individuals centered around respect for the patient and shared decision-making [30,31], with some organizations releasing statements explicitly opposing any efforts to prevent access to gender-affirming care [32,33]. Given the well-documented risks of negative mental health and suicide among transgender and nonbinary youth, it is necessary that those serving these youth provide care that is patient-centered, affirming, and evidence-based.

Funding Sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

[1] Johns MM, Lowry R, Andrzejewski J, et al. Transgender identity and experiences of violence victimization, substance use, suicide risk, and sexual risk behaviors among high school students — 19 states and large urban school districts, 2017. MMWR Morb Mortal Wkly Rep 2019;68:67–71.
[2] Price-Feeney M, Green AE, Dorison S. Understanding the mental health of transgender and nonbinary youth. J Adolesc Health 2020;66:684–90.
[3] Toomey RB, Syvertsen AK, Shramko M. Transgender adolescent suicide behavior. Pediatrics 2018;142:e20174218.
[4] Meyer IH. Resilience in the study of minority stress and health of sexual and gender minorities. Psychol Sex Orientat Gend Divers 2015;2:209–13.
[5] Chodzen G, Hidalgo MA, Chen D, Garofalo R. Minority stress factors associated with depression and anxiety among transgender and gender-nonconforming youth. J Adolesc Health 2019;64:467–71.
[6] Hendricks M, Testa R. A conceptual framework for clinical work with transgender and gender nonconforming clients: An adaptation of the minority stress model. Prof Psychol Res Pract 2012;43:460–7.
[7] Allen L, Watson L, Egan A, Moser C. Well-being and suicidality among transgender youth after gender-affirming hormones. Clin Pract Pediatr Psychol 2019;7:302–11.
[8] Turban JL, King D, Carswell JM, Keuroghlian AS. Pubertal suppression for transgender youth and risk of suicidal ideation. Pediatrics 2020;145:e20191725.
[9] Call DC, Challa M, Telingator CJ. Providing affirmative care to transgender and gender diverse youth: Disparities, interventions, and outcomes. Curr Psychiatry Rep 2021;23:1–10.
[10] Raj S. Alleviating anxiety and cultivating care: Young trans people in the family court of Australia. Aust Fem L J 2019;45:111–30.
[11] Riggs DW, Bartholomaeus C, Sansfacon AP. 'If they didn't support me, I most likely wouldn't be here': Transgender young people and their parents negotiating medical treatment in Australia. Int J Transgend Health 2020;21:3–15.
[12] Gridley SJ, Crouch JM, Evans Y, et al. Youth and caregiver perspectives on barriers to gender-affirming health care for transgender youth. J Adolesc Health 2016;59:254–61.
[13] Kremen J, Williams C, Barrera EP, et al. Addressing legislation that restricts access to care for transgender youth. Pediatrics 2021;147:e2021049940.
[14] Chew D, Anderson J, Williams K, et al. Hormonal treatment in young people with gender dysphoria: A systematic review. Pediatrics 2018;141:e20173742.
[15] Kuper LE, Stewart S, Preston S, et al. Body dissatisfaction and mental health outcomes of youth on gender-affirming hormone therapy. Pediatrics 2020;145:e20193006.
[16] Achille C, Taggart T, Eaton NR, et al. Longitudinal impact of gender-affirming endocrine intervention on the mental health and well-being of transgender youths: Preliminary results. Int J Pediatr Endocrinol 2020;2020:1–5.
[17] Richardson LP, Rockhill C, Russo JE, et al. Evaluation of the PHQ-2 as a brief screen for detecting major depression among adolescents. Pediatrics 2010;125:e1097–103.
[18] Johns MM, Lowry RR, Haderxhanaj LT, et al. Trends in violence victimization and suicide risk by sexual identity among high school students — youth risk behavior survey, United States, 2015–2019. MMWR Morb Mortal Wkly Rep 2020;79:19–27.
[19] DeChants J, Green AE, Price MN, Davis C. Measuring youth sexual orientation and gender identity. The Trevor Project. 2021. Available at: https://www.thetrevorproject.org/2021/07/28/measuring-youth-sexual-orientation-and-gender-identity/. Accessed August 20, 2021.
[20] IBM Corp. IBM SPSS Statistics for Macintosh, version 26.0. Armonk, NY: IBM Corp; 2019.
[21] O'Connor RC, Portzky G. Looking to the future: A synthesis of new developments and challenges in suicide research and prevention. Front Psychol 2018;9:2139.
[22] Conron KJ, O'Neill K, Vasquez LA. Prohibiting gender-affirming medical care for youth. The Williams Institute UCLA School of Law. 2021. Available at: https://williamsinstitute.law.ucla.edu/publications/bans-trans-youth-health-care/. Accessed August 20, 2021.
[23] Alegría M, Alvarez K, Ishikawa RZ, et al. Removing obstacles to eliminating racial and ethnic disparities in behavioral health care. Health Aff (Millwood) 2016;35:991–9.
[24] Clark BA, Marshall SK, Saewyc EM. Hormone therapy decision-making processes: Transgender youth and parents. J Adolesc 2020;79:136–47.
[25] Schnyder N, Lawrence D, Panczak R, et al. Perceived need and barriers to adolescent mental health care: Agreement between adolescents and their parents. Epidemiol Psychiatr Sci 2019;29:1–9.
[26] Hodgkinson S, Godoy L, Beers LS, Lewin A. Improving mental health access for low-income children and families in the primary care setting. Pediatrics 2017;139:e20151175.
[27] American Psychological Association. APA Resolution on gender identity change efforts. 2021. Available at: https://www.apa.org/about/policy/resolution-gender-identity-change-efforts.pdf. Accessed June 9 2021.
[28] Olson KR, Durwood L, DeMeules M, McLaughlin KA. Mental health of transgender children who are supported in their identities. Pediatrics 2016;137:e20153223.
[29] De Vries AL, McGuire JK, Steensma TD, et al. Young adult psychological outcome after puberty suppression and gender reassignment. Pediatrics 2014;134:696–704.
[30] American Psychiatric Association. Position statement on access to care for transgender and gender diverse individuals. 2018. Available at: https://www.psychiatry.org/File%20Library/About-APA/Organization-Documents-Policies/Policies/Position-2018-Discrimination-Against-Transgender-and-Gender-Diverse-Individuals.pdf. Accessed May 14, 2021.
[31] Rafferty J, Committee on Psychosocial Aspects of Child and Family Health. Ensuring comprehensive care and support for transgender and gender-diverse children and adolescents. Pediatrics 2018;142:e20182162.
[32] Beers LS. American Academy of Pediatrics Speaks out against bills harming transgender youth. 2021. Available at: https://services.aap.org/en/news-room/news-releases/aap/2021/american-academy-of-pediatrics-speaks-out-against-bills-harming-transgender-youth/. Accessed May 14, 2021.
[33] American Academy of Child & Adolescent Psychiatry. Policy statement on conversion therapy. 2018. Available at: https://www.aacap.org/AACAP/Policy_Statements/2018/Conversion_Therapy.aspx. Accessed August 26, 2019.