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Attention deficit hyperactivity disorder risk, mental health diagnoses and experience of discrimination in transgender adolescents and youth

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Mental health

Abstract
Introduction: Recent studies suggest a higher prevalence of attention-deficit hyperactivity disorder (ADHD) in transgender individuals compared to the general population. However, no studies have been conducted in the Spanish population, and most focus on individuals with a prior ADHD diagnosis rather than screening for the disorder.
Materials and methods: This is a single-center, cross-sectional observational study assessing the risk of ADHD in transgender adolescents and young adults compared to cisgender individuals using the World Health Organization's (WHO) Adult ADHD Self-Report Scale (ASRS-V1.1). Additionally, previous mental health diagnoses and experiences of discrimination are analyzed in both groups.
Results: Transgender youth scored higher on the short-form scale, indicating a greater risk of ADHD, as well as on the hyperactivity/impulsivity subscale. A significant association was also found between experiences of discrimination and a prior diagnosis of depression.
Conclusions: The ASRS-V1.1 scale may be useful for ADHD screening in transgender individuals; however, further studies are needed to confirm these findings. Risk factors for neurodevelopmental and anxiety-depressive disorders may differ in the transgender population.

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PALABRAS CLAVE
Transgénero;
Incongruencia de género;
Trastorno por déficit de atención e hiperactividad (TDAH);
Estrés de las minorías;
Discriminación;
Salud mental

Riesgo de trastorno por déficit de atención con hiperactividad, diagnósticos de salud mental y experiencia de discriminación en adolescentes y jóvenes transgénero

Resumen
Introducción: Estudios recientes parecen indicar que existe mayor prevalencia de trastorno por déficit de atención con hiperactividad (TDAH) en personas transgénero que en la población general, si bien ninguno se ha realizado en población española y la mayoría buscan un diagnóstico previo de TDAH y no un despistaje del mismo.
Material y métodos: Se trata de un estudio observacional transversal unicéntrico en el que se valora el riesgo de TDAH en adolescentes y adultos jóvenes transgénero comparado con personas cisgénero mediante el cuestionario auto-informado de cribado del TDAH del adulto de la Organización Mundial de la Salud (OMS)(ASRS-V1.1). Así mismo se analizan diagnósticos de salud mental y experiencia de discriminación previos en ambos grupos.
Resultados: Los jóvenes transgénero obtienen una puntuación mayor en la escala reducida, indicando un mayor riesgo de TDAH, así como puntuaciones mayores en la subescala de hiperactividad/impulsividad. Se encuentra también una relación significativa entre haber sufrido discriminación y el diagnóstico previo de depresión.
Conclusiones: La escala ASRS-V1.1 podría ser útil para el cribado de TDAH en personas transgénero, sin embargo, son necesarios más estudios que confirmen estos resultados. Los factores de riesgo de los trastornos en el neurodesarrollo y de los trastornos ansioso-depresivos podrían ser diferentes en la población transgénero.

Introduction

Transgender people are those whose self-perceived gender identity differs from the gender assigned at birth, or whose gender expression does not conform to the social expectations associated with their assigned gender.[1] Regarding gender incongruence, WHO uses the ICD-11 definition,[2] which considers it a marked and persistent incongruence between a person's experienced gender and assigned sex, often leading to a desire to transition to live and be accepted as the experienced gender. Of note, transgender people do not always experience gender dysphoria, which refers to the clinically significant distress arising from incongruence between felt gender identity and sex assigned at birth, as defined in the DSM-5.[3]

Former studies have identified that transgender people experience more mental health problems than cisgender populations, specifically more depressive symptoms and anxiety.[4] There is broad consensus around minority stress as an explanatory framework, positing that sexual and gender minorities experience greater stress associated with social discrimination.[5]

A higher prevalence of certain neurodevelopmental disorders has also been reported, such as autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD).[6,7] Nevertheless, although there are suggestive data on co-occurrence, the theoretical and methodological bases supporting this relationship have important limitations. Among them, the frequency of ADHD is often captured via self-reported diagnosis or symptoms in non-structured interviews, and many studies lack control groups, underscoring the need for further research.

ADHD is a heterogeneous disorder characterized by core symptoms of hyperactivity, impulsivity, and/or inattention that are excessive for the person's age or overall developmental level. Diagnosis requires functional impairment that negatively affects psychological, social, and/or educational/occupational functioning, with symptoms present since childhood.[8] ADHD symptoms can overlap with those of related disorders, requiring careful differential diagnosis.[8]

When comorbidity is present, it is important to distinguish symptomatology attributable to ADHD to guide treatment planning. Moreover, ADHD is under-recognized in some populations, which can mean that lack of appropriate diagnosis and treatment adversely affects quality of life. Although the relationship between ADHD and other conditions is well described,[8] the link with gender incongruence is more recent and remains under-studied. The overlap between gender incongruence and ADHD was first described in 2014, with a 6.64-fold higher prevalence of gender incongruence in patients with ADHD than in controls.[7] The 2020 systematic review by Thrower et al.[6] reports increased ADHD frequency among people with gender dysphoria—both adults[9,10] and minors—with subsequent studies corroborating these findings,[11–14] and reporting ADHD prevalence spanning 4.3% to 20.4%. However, only 1 study included a control group, and most relied on prior ADHD diagnosis. Existing literature on the ADHD–trans nexus is recent, scarce, and constrained by small sample sizes; none has been conducted in Spain.[7]

The aims of this study are: (1) to examine ADHD risk in adolescents with gender incongruence (transgender) vs age-matched adolescents whose gender aligns with their assigned sex (cisgender) using a specific screening questionnaire; (2) to identify prior mental health diagnoses, including ADHD, and experiences of discrimination, comparing both groups; and (3) to analyze the relationship between discrimination experiences and prior diagnoses and ADHD risk in transgender youth.

Methods

Design

We conducted a single-center, observational, cross-sectional, retrospective study of adolescents and young adults, comparing transgender individuals followed in a pediatric endocrinology clinic at a tertiary referral center in the Community of Madrid (*Hospital Clínico San Carlos;* Madrid, Spain) with age-matched cisgender individuals recruited in local high schools and colleges via simple volunteer sampling (snowball, non-probability sampling disseminated by medical students). The cisgender sample size was set to ensure groups were comparable by sex assigned at birth. Assessments were conducted from November 2022 through May 2023.

Participants

Inclusion criteria

1 Diagnosis of gender incongruence per ICD-11 criteria.[2]
2 Age 14–25 years at inclusion in either group.
3 Written informed consent for adults; for minors, assent plus legal guardian consent.

Exclusion criteria

1 Age outside the eligible range at study start.
2 Language barrier.
3 Lack of signed informed consent.

Instruments

An interviewer-administered survey captured sociodemographic variables (age, sex—''genetic, hormonal, anatomic, and physiologic characteristics on the basis of which a person is classified as male or female at birth''[1]—and gender identity—''one's internal, individual experience of gender as deeply felt, which may or may not correspond to sex assigned at birth, including one's personal experience of the body''[1]), prior mental health history (personality disorder, depression, anxiety, eating disorder, ASD, ADHD, substance use disorder, or other), and experiences of discrimination in school, work, and/or family contexts.

ADHD risk was screened with the WHO Adult ADHD Self-Report Scale (ASRS-v1.1; 18-item), developed by WHO and the Kessler group in 2005.[15] The instrument is based on DSM-IV-TR criteria of the American Psychiatric Association.[3] Although designed for adults, it has demonstrated validity in adolescents; Spanish versions have been validated in adults[16,17] and children/adolescents.[18] Items are rated on 5 options (''never,'' ''rarely,'' ''sometimes,'' ''often,'' ''very often''). The first 6 items (the first 4 inattention + 2 hyperactivity) can be scored as a standalone short screener (''ASRS-6'') for rapid ADHD screening,[19] or all 18 items can be used (''ASRS-18''). Inattentive (ADHD-I) and hyperactive-impulsive (ADHD-HI) subscales can also be scored; a subscale score $\geq$ 6 (range 0–9) is considered positive.[20]

Both scales can be interpreted dichotomously or polytomously (procedures in Appendix A). The traditional, most widely used approach is dichotomous, applying cut points to classify positive ADHD screens.[15,16,20] Polytomous interpretation also has published cut points for both ASRS-6 and ASRS-18, but is less well validated,[15,16] and here was used to compare total scores across groups (cut points in Appendix B).

Psychometrics (original version) for ASRS-6 vs ASRS-18, respectively: sensitivity 68.7% vs 56.3%, specificity 99.5% vs 98.3%, AUC 0.84 vs 0.77, and overall accuracy 97.9% vs 96.2%, with kappa 0.76 vs 0.58.[15] In Spanish adaptations, ASRS-6[16] and ASRS-18[17] show sensitivity 82.2% vs 81.9%, specificity 95.6% vs 87.3%, AUC 0.89 vs 0.94, and kappa 0.78 vs 0.88, respectively.

Procedure

Transgender participants were approached in the pediatric endocrinology clinic and invited to participate; informed consent (and for minors, guardian consent plus assent) was obtained, followed by a verbal interview and a self-completed questionnaire.

Regarding the cisgender group, participation was through simple volunteer recruitment. The informed-consent signing and interview/questionnaire procedure was the same as for the other participants.

The study results were entered anonymously into the database to protect personal data. The study was submitted to and approved by the hospital Clinical Research Ethics Committee prior to commencement (*Hospital Clínico San Carlos* CREC code 21/737-E).

Data were recorded anonymously to protect personal information. The study was approved by the hospital's Research Ethics Committee prior to initiation (CEIm Hospital Clínico San Carlos, code 21/737-E).

Statistical analysis

We performed descriptive analyses of sociodemographics, clinical histories, and questionnaire results. ADHD risk and prevalences for other queried variables were expressed as frequency and percentage; item scores and other quantitative variables as mean (SD) or median (IQR), according to distribution.

We tested the null hypothesis of independence between group (transgender vs cisgender) and ADHD risk or prior clinical/family histories using chi-square or Fisher's exact

Table 1 Demographic characteristics of the cisgender and transgender groups.

Sociodemographic variables	Total, n = 71[a]	Cisgender, n = 48[a]	Transgender, n = 23[a]	p
Biological sex				0.70[b]
Woman	59 (83.1%)	39 (81.3%)	20 (87.0%)	
Man	12 (16.9%)	9 (18.8%)	3 (13.0%)	
Age				0.0747[c]
Mean ± SD	20.0 ± 2.3	20.4 ± 1.9	19.3 ± 2.9	
Median [25%–75%]	20.0 [19.0–22.0]	21.0 [19.0–22.0]	19.0 [17.0–21.0]	

[a] n (%); mean ± standard deviation; median [interquartile range].
[b] Fisher's exact test.
[c] Mann–Whitney U test.

tests. Association strength was described with Cramer's V (low < 0.2; moderate 0.2–0.6; high > 0.6). Relative risk (RR) and odds ratio (OR) were used to compare outcomes across groups.

Group comparisons for item, subscale, and total scores (dichotomous and polytomous scoring) used the Mann–Whitney U test. Effect sizes used Vargha–Delaney A (VDA): low (0.56–0.64 or 0.34–0.44), moderate (0.64–0.71 or 0.29–0.34), high (≥ 0.71 or ≤0.29).

Prevalence of ADHD in this study was compared with prior reports using Pearson chi-square (Yates continuity correction).

Type I error was set at 0.05; analyses used R v4.3.2.

Results

Sociodemographic characteristics

We recruited a total of 71 adolescents/young adults (mean age, 20.0 ± 2.3 years; range, 14–25): 23 transgender individuals (20 transmasculine, 3 transfeminine) and 48 age-matched cisgender individuals (39 women, 9 men).

Groups were similar in age (p = 0.074) and sex assigned at birth (p = 0.70) (Table 1).

ADHD risk (classification by total-score cut points)

On dichotomous ASRS-18 (cut point ≥12), 4.2% of the cisgender group screened positive for ADHD vs 13% of the transgender group; this association was not statistically significant (p = 0.3).

On dichotomous ASRS-6 (cutoff ≥ 4), 22.9% tested positive in the cisgender group vs 47.8% in the transgender group; this association was statistically significant (p = 0.034) with a moderate effect size (Cramer V = 0.252). The OR was 3.083 (95%CI, 1.068–8.894) and RR, 2.086 (95%CI, 1.065–4.086), indicating the transgender group had roughly double the risk of a positive ADHD screen on ASRS-6 (Table 2).

Total-score analyses in both groups

- *By item*. Mean scores were higher in the transgender group for most items, with significantly higher scores for item 5 (''How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?''), item 11 (''How often are you distracted by activity or noise around you?''), item 12 (''How often do you leave your seat in meetings or other situations in which you are expected to remain seated?''), and item 13 (''How often do you feel restless or agitated?'') (Table 3).
- *By subscale*. In ASRS-18 subscales, the transgender group scored higher on both inattention and hyperactivity/impulsivity; the difference was statistically significant for hyperactivity/impulsivity with a small effect size on dichotomous scoring (VDA, 0.344; p = 0.031) and a moderate effect size on polytomous scoring (VDA, 0.316; p = 0.013) (Table 3).
- *By total scale*. Mean total scores were consistently higher in the transgender group across ASRS-6 and ASRS-18, using both dichotomous and polytomous scoring (Table 3).

Mental health history and discrimination

Transgender group membership was associated with prior diagnoses of depression (OR, 23.8; 95%CI, 2.83–1,127; RR, 16.7; 95%CI, 2.217–125.67) and panic/anxiety disorder (OR, 4.47; 95%CI, 1.10–20.3; RR, 3.34; 95%CI, 1.227–9.083). Discrimination history was also associated with transgender status, higher frequencies of school-based discrimination (OR, 13.5; 95%CI, 3.73–56.7; RR, 4.43; 95%CI, 2.252–8.732) and family discrimination (OR, 13.1; 95%CI, 2.88–84.8; RR, 7.65; 95%CI, 2.361–24.8) vs the cisgender group (Appendix C).

Within the transgender group, discrimination (social, school, or family) was not associated with ADHD risk (Table 4), but family discrimination was associated with depression diagnosis (Table 5).

Regarding the relationship between experiences of discrimination and ADHD risk and prior mental health diagnoses in the transgender youth group, no association was found between social, school, or family discrimination and ADHD risk (Table 4), but there was an association between family discrimination and a diagnosis of depression (Table 5).

Discussion

The primary endpoint was to assess ADHD risk in transgender adolescents and young adults to improve care, reduce underdiagnosis, and mitigate downstream complications.

Table 2 Difference in prevalence between groups (ADHD risk by dichotomous total-score cutoffs).

	Cutoff	Total, n = 71[a]	Cisgender, n = 48[a]	95%CI[b]	Transgender, n = 23[a]	95%CI[b]	p	Cramer's V	OR (RR)	95%CI[b]
ADHD (full 18-item scale [ASRS-18])	ADHD (≥ 12)	5 (7.0%)	2 (4.2%)	0.725%–15.4%	3 (13.0%)	3.431%–34.7%	0.3[c]	0.162	3.45	0.53–22.26
Inattention (dichotomous, 9 items)	ADHD (≥ 6)	21 (29.6%)	11 (22.9%)	12.51%–37.7%	10 (43.5%)	23.9%–65.1%	0.076	0.211	2.587	0.892–7.500
Hyperactivity (dichotomous, 9 items)	ADHD (≥ 6)	4 (5.6%)	3 (6.2%)	1.628%–18.2%	1 (4.3%)	0.227%–24.0%	>0.9	0.039	0.681	0.067–6.937
ADHD (partial first 6 items [ASRS-6])	ADHD (≥ 4)	22 (31.0%)	11 (22.9%)	12.51%–37.7%	11 (47.8%)	27.4%–68.9%	0.034[d]	0.252[e]	3.083 (2.086)	1.068–8.894 (1.065–4.086)

OR: odds ratio; RR: relative risk.
[a] n (%).
[b] CI: confidence interval.
[c] Fisher exact test.
[d] Chi-square test.
[e] Magnitude of association: moderate.

Table 3 Mean differences in total score, domain, and item between cisgender and transgender groups — Dichotomous and polytomous scoring.

Item	Dichotomous score					Polytomous score				
	Total, n = 71[a]	Cisgender, n = 48[a]	Transgender, n = 23[a]	p[b]	VDA	Total, n = 71[a]	Cisgender, n = 48[a]	Transgender, n = 23[a]	p[b]	VDA
1. How often do you have difficulty wrapping up the final details of a project once the challenging parts are done? (I)	0.4 ± 0.5	0.4 ± 0.5	0.5 ± 0.5	0.6	0.469	1.6 ± 1.0	1.5 ± 0.9	1.7 ± 1.3	0.7	0.474
2. How often do you have difficulty getting things in order when you have to do a task that requires organization? (I)	0.5 ± 0.5	0.5 ± 0.5	0.6 ± 0.5	0.7	0.477	1.7 ± 1.1	1.6 ± 1.1	1.8 ± 1.3	0.5	0.454
3. How often do you have trouble remembering appointments or obligations? (I)	0.5 ± 0.5	0.5 ± 0.5	0.5 ± 0.5	0.7	0.478	1.6 ± 1.2	1.6 ± 1.2	1.8 ± 1.2	0.5	0.451
4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started? (I)	0.5 ± 0.5	0.4 ± 0.5	0.5 ± 0.5	0.8	0.479	2.4 ± 1.2	2.4 ± 1.1	2.3 ± 1.2	0.8	0.516
5. How often do you fidget or squirm with your hands or feet when you have to sit for a long time? (H)	0.5 ± 0.5	0.4 ± 0.5	0.7 ± 0.5	0.012	0.339*	2.4 ± 1.3	2.1 ± 1.2	2.9 ± 1.4	0.014	0.322**
6. How often do you feel overly active and compelled to do things, as if driven by a motor? (H)	0.2 ± 0.4	0.2 ± 0.4	0.2 ± 0.4	0.6	0.474	1.7 ± 1.0	1.7 ± 1.0	1.6 ± 1.1	0.7	0.531
7. How often do you make careless mistakes on a boring or difficult project? (I)	0.3 ± 0.4	0.2 ± 0.4	0.4 ± 0.5	0.11	0.408*	1.9 ± 1.1	1.8 ± 1.0	2.1 ± 1.4	0.4	0.442
8. How often do you have difficulty keeping your attention when doing boring or repetitive work? (I)	0.5 ± 0.5	0.5 ± 0.5	0.5 ± 0.5	0.9	0.489	2.4 ± 1.1	2.4 ± 1.0	2.5 ± 1.2	0.8	0.480
9. How often do you have difficulty concentrating on what people say to you, even when speaking directly to you? (I)	0.4 ± 0.5	0.3 ± 0.5	0.5 ± 0.5	0.13	0.406*	1.4 ± 0.9	1.3 ± 0.9	1.6 ± 1.0	0.2	0.406*

Table 3 (*Continued*)

Item	Dichotomous score					Polytomous score				
	Total, n = 71[a]	Cisgender, n = 48[a]	Transgender, n = 23[a]	p[b]	VDA	Total, n = 71[a]	Cisgender, n = 48[a]	Transgender, n = 23[a]	p[b]	VDA
10. How often do you misplace or have trouble finding things at home or at work? (I)	0.3 ± 0.5	0.3 ± 0.5	0.3 ± 0.5	>0.9	0.493	2.0 ± 1.2	2.0 ± 1.3	2.1 ± 1.2	>0.9	0.494
11. How often are you distracted by activity or noise around you? (I)	0.4 ± 0.5	0.3 ± 0.4	0.6 ± 0.5	0.007	0.331*	2.2 ± 1.1	2.0 ± 1.1	2.7 ± 1.2	0.017	0.330**
12. How often do you leave your seat in meetings or other situations where remaining seated is expected? (H)	0.1 ± 0.3	0.0 ± 0.2	0.2 ± 0.4	0.022	0.412*	0.6 ± 0.8	0.4 ± 0.6	1.0 ± 1.1	0.012	0.336*
13. How often do you feel restless or agitated? (H)	0.3 ± 0.4	0.2 ± 0.4	0.4 ± 0.5	0.016	0.365*	1.8 ± 1.1	1.5 ± 1.0	2.5 ± 1.0	<0.001	0.240***
14. How often do you have difficulty unwinding and relaxing when you have time to yourself? (H)	0.3 ± 0.4	0.2 ± 0.4	0.3 ± 0.5	0.6	0.472	1.7 ± 1.3	1.6 ± 1.2	2.0 ± 1.4	0.2	0.411*
15. How often do you find yourself talking too much in social situations? (H)	0.2 ± 0.4	0.2 ± 0.4	0.2 ± 0.4	0.7	0.517	1.7 ± 1.0	1.7 ± 1.0	1.7 ± 1.1	0.6	0.532
16. When you're in a conversation, how often do you find yourself finishing the sentences of the people you are talking to before they can finish them? (H)	0.4 ± 0.5	0.5 ± 0.5	0.3 ± 0.5	0.4	0.555	1.3 ± 1.1	1.4 ± 1.1	1.2 ± 1.2	0.5	0.550
17. How often do you have difficulty waiting your turn in situations when turn taking is required? (H)	0.1 ± 0.3	0.1 ± 0.3	0.1 ± 0.3	>0.9	0.498	1.2 ± 1.0	1.1 ± 0.9	1.3 ± 1.1	0.6	0.463
18. How often do you interrupt others when they are busy? (H)	0.4 ± 0.5	0.4 ± 0.5	0.5 ± 0.5	0.6	0.469	1.4 ± 0.8	1.4 ± 0.9	1.3 ± 0.8	0.8	0.517
Hyperactivity subscale (H)	2.4 ± 1.7	2.2 ± 1.7	3.0 ± 1.6	0.031	0.344*	13.7 ± 5.6	12.9 ± 5.4	15.5 ± 5.7	0.013	0.316**
Inattention subscale (I)	3.7 ± 2.6	3.4 ± 2.4	4.3 ± 2.9	0.2	0.402*	17.3 ± 6.9	16.6 ± 6.5	18.6 ± 7.5	0.3	0.417*
Total scale, 18 items (ASRS-18)	6.5 ± 3.9	5.9 ± 3.7	7.7 ± 4.1	0.068	0.365*	31.0 ± 11.0	29.5 ± 10.5	34.0 ± 11.8	0.083	0.3718*
Total scale, first 6 items (ASRS-6)	3.0 ± 1.7	2.8 ± 1.7	3.4 ± 1.8	0.11	0.383*	11.4 ± 4.2	11.0 ± 4.1	12.2 ± 4.3	0.2	0.403*

VDA: Vargha & Delaney effect size index.

[a] Mean ± standard deviation.

[b] Mann–Whitney U test.

Table 4 Differences in ADHD scores by discrimination item in the transgender group.

	School discrimination				Work discrimination				Family discrimination			
	Total (n = 23) [a]	No (n = 6) [a]	Yes (n = 17) [a]	p [b]	Total (n = 23) [a]	No (n = 21) [a]	Yes (n = 2) [a]	p [b]	Total (n = 23) [a]	No (n = 12) [a]	Yes (n = 11) [a]	p [b]
18-item total scale (ASRS-18)	34.0 ± 11.8 34.0 [26.5–41.0]	32.3 ± 9.6 33.0 [26.0–39.3]	34.6 ± 12.7 34.0 [27.0–41.0]	0.7	34.0 ± 11.8 34.0 [26.5–41.0]	32.7 ± 10.8 32.0 [26.0–41.0]	48.0 ± 17.0 48.0 [42.0–54.0]	0.14	34.0 ± 11.8 34.0 [26.5–41.0]	33.8 ± 6.8 33.0 [31.0–38.8]	34.4 ± 15.9 34.0 [24.0–47.5]	>0.9
6-item partial scale (ASRS-6)	12.2 ± 4.3 13.0 [8.5–15.5]	11.5 ± 4.2 13.0 [8.0–15.0]	12.4 ± 4.4 13.0 [9.0–16.0]	0.4	12.2 ± 4.3 13.0 [8.5–15.5]	12.0 ± 4.1 13.0 [9.0–15.0]	13.5 ± 7.8 13.5 [10.8–16.3]	0.7	12.2 ± 4.3 13.0 [8.5–15.5]	13.0 ± 3.1 14.5 [11.0–15.0]	11.3 ± 5.3 12.0 [7.5–16.0]	0.6
Hyperactivity subscale, mean ± SD	15.5 ± 5.7 15.0 [14.0–19.0]	15.0 ± 4.9 15.0 [13.5–18.0]	15.6 ± 6.1 15.0 [14.0–19.0]	0.8	15.5 ± 5.7 15.0 [14.0–19.0]	14.9 ± 5.4 15.0 [14.0–19.0]	21.5 ± 6.4 21.5 [19.3–23.8]	0.2	15.5 ± 5.7 15.0 [14.0–19.0]	15.6 ± 3.7 15.0 [14.0–18.3]	15.4 ± 7.5 15.0 [13.5–21.0]	0.8
Inattention subscale, mean ± SD	18.6 ± 7.5 19.0 [13.0–24.0]	17.3 ± 5.2 18.0 [13.3–19.8]	19.0 ± 8.3 20.0 [13.0–24.0]	0.6	18.6 ± 7.5 19.0 [13.0–24.0]	17.8 ± 7.1 19.0 [13.0–24.0]	26.5 ± 10.6 26.5 [22.8–30.3]	0.3	18.6 ± 7.5 19.0 [13.0–24.0]	18.2 ± 4.3 18.5 [14.5–20.5]	19.0 ± 10.2 20.0 [10.0–26.5]	0.8

[a] Mean ± SD; median [IQR].
[b] Mann–Whitney U test.

Table 5 Association of prior mental-health diagnoses and discrimination in the transgender group.

Prior diagnosis (Yes)	School discrimination				Work discrimination				Family discrimination			
	Total (n = 23)[a]	No (n = 6)[a]	Yes (n = 17)[a]	p[b]	Total (n = 23)[a]	No (n = 21)[a]	Yes (n = 2)[a]	p[b]	Total (n = 23)[a]	No (n = 12)[a]	Yes (n = 11)[a]	p[b]
Has any psychologist/psychiatrist told you that you have a personality disorder?	1 (4.3%)	0 (0.0%)	1 (5.9%)	>0.9	1 (4.3%)	1 (4.8%)	0 (0.0%)	>0.9	1 (4.3%)	0 (0.0%)	1 (9.1%)	0.5
Has any psychologist/psychiatrist told you that you have depression?	8 (34.8%)	1 (16.7%)	7 (41.2%)	0.4	8 (34.8%)	6 (28.6%)	2 (100.0%)	0.11	8 (34.8%)	1 (8.3%)	7 (63.6%)	0.009
Has any psychologist/psychiatrist told you that you have ADHD?	1 (4.3%)	0 (0.0%)	1 (5.9%)	>0.9	1 (4.3%)	1 (4.8%)	0 (0.0%)	>0.9	1 (4.3%)	0 (0.0%)	1 (9.1%)	0.5
Has any psychologist/psychiatrist told you that you have an eating disorder (anorexia, bulimia, or others)?	2 (8.7%)	0 (0.0%)	2 (11.8%)	>0.9	2 (8.7%)	1 (4.8%)	1 (50.0%)	0.2	2 (8.7%)	0 (0.0%)	2 (18.2%)	0.2
Has any psychologist/psychiatrist told you that you have an autism spectrum disorder (Asperger syndrome)?	0 (0.0%)	0 (0.0%)	0 (0.0%)	>0.9	0 (0.0%)	0 (0.0%)	0 (0.0%)	>0.9	0 (0.0%)	0 (0.0%)	0 (0.0%)	>0.9
Has any psychologist/psychiatrist told you that you have a panic/anxiety disorder?	8 (34.8%)	1 (16.7%)	7 (41.2%)	0.4	8 (34.8%)	7 (33.3%)	1 (50.0%)	>0.9	8 (34.8%)	3 (25.0%)	5 (45.5%)	0.4
Has any psychologist/psychiatrist told you that you have a substance use disorder?	1 (4.3%)	0 (0.0%)	1 (5.9%)	>0.9	1 (4.3%)	1 (4.8%)	0 (0.0%)	>0.9	1 (4.3%)	0 (0.0%)	1 (9.1%)	0.5

[a] n (%).
[b] Fisher's exact test.

In general, test stratification is challenging for minority populations, and use of conventional questionnaires may lead to overdiagnosis.[21] Employing a tool that does not require gender stratification—such as the ASRS-v1.1—may be optimal; hence its selection here.

Mean scores were higher in the transgender group on the short form (ASRS-6), the hyperactivity subscale, and under both dichotomous and polytomous scoring—which is consistent with prior work and supporting the previously described coexistence of ADHD and gender incongruence.[6]

Former studies report ADHD prevalence among transgender people ranging from 4% to 20%,[9–14] which is similar to our transgender group's ASRS-18 prevalence (13%) (comparison in Appendix D). The cisgender group's positive rate (4.2%) is close to the 5.05% global adult prevalence for ages 18–24 reported by Song et al.,[22] suggesting that ASRS-18 may be a suitable ADHD screener in transgender populations—recognizing that screening requires subsequent diagnostic confirmation.

Analyzing subscale scores, the transgender group had higher mean scores on both the inattention and the hyperactivity/impulsivity subscales, although this difference reached statistical significance only for hyperactivity/impulsivity. This is consistent with results previously described by Kolbuck et al.[23]

Regarding the abbreviated 6-item version (ASRS-6), the proportions screening positive for ADHD were very high in both groups (47.8% in the transgender group and 22.9% in the cisgender group) relative to former studies/the general population to consider the short scale as valid. In our view, these results may reflect the small sample size, and further studies with larger samples are needed.

The transgender group had higher mean scores than the cisgender group on most items, with significant differences on items 5 (''How often do you fidget or squirm with your hands or feet when you have to sit for a long time?''), 11 (''How often are you distracted by activity or noise around you?''), 12 (''How often do you leave your seat in meetings or other situations in which you are expected to remain seated?''), and 13 (''How often do you feel restless or agitated?''). Item 11 belongs to the inattention subscale, whereas the other three are scored on the hyperactivity/impulsivity subscale. These items could reflect anxiety symptoms, which are more prevalent in people with a transgender identity.[4] For more precise detection, use of the longer instrument appears advisable, and additional studies are needed to examine the convergent and discriminant validity of this instrument in this population.

To our knowledge, based on the literature reviewed, this is the first study conducted in Spain on ADHD in transgender individuals. Moreover, prior studies have generally assessed ADHD prevalence via direct interview and self-reported data, except for one study[13] that analyzed a pediatric database for prior ADHD diagnoses in transgender individuals. In contrast, our study not only sought prior ADHD diagnoses but also performed ADHD screening—an important step given that this disorder is frequently underdiagnosed in adulthood.[24]

In the transgender group, self-reported mental health disorders were more prevalent than in the cisgender group, with 34.8% reporting a diagnosis of depression and 34.8% reporting panic/anxiety disorder. These findings are consistent with former reviews describing higher rates of anxiety and depression in transgender populations compared with the general population.[4]

The transgender group reported school discrimination in 73.9%, a figure much higher than in the cisgender group and consistent with the 2021 meta-analysis by Feijóo and Rodríguez-Fernández, which examined bullying prevalence against the LGBT+community among school-age children and adolescents in Spain.[25] The transgender group also reported a higher rate of family discrimination, a problem observed in former studies as well.[26]

When analyzing the relationship between discrimination experiences and mental health problems, an association emerged between depression and family discrimination, consistent with minority stress theory. Greater exposure to discriminatory experiences places transgender individuals at increased risk for mental health problems.[27] In this study, however, no such association was found with ADHD, which may reflect differing risk factors between neurodevelopmental disorders and anxiety-depressive disorders, although discrimination experiences can coexist across both groups of disorders.

Some authors approach the ADHD–transgender nexus from a ''neuroqueer'' framework that seeks to decenter the neurotypical perspective that ADHD is inherently negative or undesirable,[7] complementing the social model of disability, which posits that society disables an individual rather than the individual's condition.

The main limitations of this study include the small sample size, underrepresentation of transgender women, and use of a convenience sample. The female-to-male:male-to-female (FtM:MtF) ratio was 6.7:1. Although historically the ratio was reversed (2–3:1), in 20th-century cohorts it began to equalize (≈1:1) during the 1st decade of the 21st century.[28,29] In the last decade, pediatric descriptions show an inversion of the FtM:MtF ratio (≈2:1), with a more pronounced increase in adolescence than in childhood.[30] Although our ratio is higher than average, it is similar to that reported in former studies (6.8:1).[12] To make the groups comparable, we recruited proportionally more cisgender women than men so that groups would be equivalent by sex assigned at birth. Of note, participants were those attending an endocrinology clinic, which may introduce selection bias (e.g., toward youth experiencing gender dysphoria).

Conclusions

This is the first Spanish screening study of ADHD prevalence in transgender adolescents and young adults. The results show a higher prevalence or greater risk of ADHD in transgender people than in cisgender populations. Further studies with larger samples and methodological improvements are needed to confirm these ADHD findings, including diagnostic interviews to determine whether the prevalence is truly

higher or whether the symptomatology is more related to gender incongruence than actual ADHD.

We consider it very important to screen for possible cognitive–behavioral disorders (ASD, ADHD) in transgender patients, as underdiagnosis may further worsen their quality of life—especially during the particularly complex stage of adolescence.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.endien.2025.501593.

Declaration of competing interest

None declared.

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