The mean age of gender dysphoria diagnosis is decreasing

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Yezhe Lin 1,4, Maria Stack Hankey 5, Anita S Kablinger 1

INTRODUCTION

Gender dysphoria (GD), or gender identity disorder, is defined as persistent distress stemming from the incongruence between one’s assigned sex at birth and gender identity.1 GD has traditionally been introduced as a rare condition predominant in assigned males at birth (AMABs).2 However, recent studies have shown an upward trend in assigned females at birth (AFABs) with a dramatic reversal of the AMAB:AFAB ratio.3–5 The actual AMAB:AFAB ratio varies by age group and study population.1,4–6 Questions have been raised concerning the increasing number of youth who seek professional care for GD, especially adolescent AFABs.7

Current GD studies are significantly limited by small sample sizes, short follow-up periods, or out-of-date data sets. In this study, we analysed data from multiple healthcare organisations between 2017 and 2021. Our aims were to uniquely illustrate an updated epidemiological trend by providing an estimated prevalence of GD and explore how sex assigned at birth and age influence GD.

METHODS

Data and study design

We conducted a retrospective review of the TriNetX database Research Network in April 2022. This database provides access to de-identified electronic medical records. Available data include diagnoses, procedures, medications, laboratory values and genomic information from approximately 66 million patients from 49 healthcare organisations. Data sources included inpatients and outpatients from hospitals, primary care and speciality clinics. Most data were obtained from large academic medical institutions and their affiliated facilities. Approximately 80% of the patients were in the United States of America (USA). The Carilion Clinic Institutional Review Board designated the study as non-human subject research (NHSR) due to the de-identification of patient information inherent in TriNetX.

Sampling

Study subjects were defined as patients aged 4–65 with a diagnosis of gender identity disorder (International Statistical Classification of Diseases, ICD-10: F64). Patients with GD were compared with all patients aged 4–65 in the database. We applied all available ICD-10 codes, visit codes, current procedural terminology (CPT) codes, collection of standardised codes that represent medical procedures, supplies, products and service (HCPCS) codes as well as medication codes to identify patient population size in the database in each survey year.8 We obtained patient information from 30 April 2017 to 30 April 2022, including assigned sex at birth and age per year. Each survey year was defined as the year following 30 April. For example, the survey year 2017 indicated 30 April 2017 to 30 April 2018.

Statistical analyses

We used TriNetX analytics, the built-in analytic tool of the TriNetX database, to analyse the characteristics of subjects by applying Fisher’s exact test for categorical variables and t-test for continuous variables. We compared baseline characteristics, including age, sex, ethnicity and race, for patients diagnosed with GD and all the other patients available in the database. Statistical significance was set as p-value<0.05. Age trends in GD prevalence by survey year (2017–2021) and sex were calculated independently (figure 1A,B). Differential time trends in GD diagnosis between sex and age at GD diagnosis were tested by two-way interactions of sex and age at GD diagnosis in binary logistic regression for the whole population. Logistic regression analysis was conducted using STATA 17 (College Station, TX).
than that in AMABs before the age of 22 (odds ratio (OR): 1.50; 95% CI: 1.48 to 1.52; p<0.001).

The estimated prevalence of GD diagnosis increased significantly from 2017 to 2021 (figure 1A). The mean (standard error (SE)) age at GD diagnosis decreased from 31.49 (0.105) in 2017 to 26.27 (0.063) in 2021 (p<0.001). Stratifying the population by assigned sex at birth, the highest prevalence of GD diagnosis among AFABs was at age 19 whereas for AMABs was at age 23 (figure 1B). The mean age at GD diagnosis across all survey years was 27.47 (0.046) in AFABs and 30.47 (0.055) in AMABs (p<0.001). The logistic regression analysis resulted in a significant interaction between age and sex assigned at birth.

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Table 1  Baseline characteristics: demographic data of patients with gender dysphoria and study population.

<table>
<thead>
<tr>
<th></th>
<th>Patients with gender dysphoria</th>
<th>Study population</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (%)</td>
<td>Number (%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>66078</td>
<td>42720215</td>
<td></td>
</tr>
<tr>
<td>Age, mean (SD)</td>
<td>26 (12)</td>
<td>34 (17)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sex assigned at birth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>27304 (41.3)</td>
<td>19190043 (44.9)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Female</td>
<td>38093 (57.6)</td>
<td>23345560 (54.6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Unknown</td>
<td>681 (1.0)</td>
<td>184612 (0.4)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>5589 (8.5)</td>
<td>4593152 (10.8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Not Hispanic/Latino</td>
<td>47033 (71.2)</td>
<td>23140641 (54.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Unknown ethnicity</td>
<td>13456 (20.4)</td>
<td>14986422 (35.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>48137 (72.8)</td>
<td>24607814 (57.6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Unknown</td>
<td>10078 (15.3)</td>
<td>9907100 (23.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Black or African American</td>
<td>5869 (8.9)</td>
<td>6511445 (15.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Asian</td>
<td>1326 (2.0)</td>
<td>1412057 (3.3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>592 (0.9)</td>
<td>213571 (0.5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Native Hawaiian or Other Pacific Islander</td>
<td>76 (0.1)</td>
<td>68228 (0.2)</td>
<td>0.004</td>
</tr>
</tbody>
</table>

For categorical variables, a Fisher’s exact test was conducted; for continuous variables, a t-test was conducted. SD, standard deviation.

sex and age groups. Further investigation is warranted to determine the persistence of GD diagnosis. Notably, changing identity over time should not be pathologised considering the gender-fluid nature in certain populations. That is to say, GD is not a permanent diagnosis.

Increased availability of speciality gender clinics might generally explain the increasing number of patients with GD. The decreasing mean age of GD diagnosis suggests an increasing gender non-congruent youth population. The phenomenon might be related to increased accessibility of gender care as well as a gender-minority-friendly social context. Gender identity development heavily leans on social processes, including exploration and experimentation with external feedback. There is now increasing acceptance of gender-neutral pronouns and gender-non-congruent chosen names. Gender minority youth are no longer receiving consistent toxic feedback regarding their identity. Additionally, digital platforms such as video games provide a ‘transitional playground’ that allows youth to explore their identity with more freedom and less worry compared with traditional social situations. The concept of gender is a cultural construct rather than a genetic fact. The decreased mean age of GD suggests less oppression of gender minority youth and increased awareness of gender diversity. A survey-based study reported 600/100 000 youths under the age of 21 identified themselves as transgender. This number is much higher than the estimated prevalence we observed.

Previous research and our results demonstrate the need for expanded and accessible gender clinic services.

Limitations
In our study, we assumed gender dysphoria in the Diagnostic and Statistical Manual (DSM) to be equivalent to gender identity disorder as classified in the ICD system, which might be confusing. Gender identity disorder is the old term for gender dysphoria in the DSM-IV, with minor differences in diagnostic criteria. We considered the two diagnoses to be the same because only the DSM-5 and DSM-5-TR were available during our study period while there was no change in the ICD system. We applied ICD code F64 (gender identity disorder), which includes the controversial diagnosis of dual-role transvestism (F64.1) and other gender identity disorders (F64.8) which may not meet the full criteria for GD. However, even by applying a broader code with the hope to cover all potential patients with GD, we still could not estimate the GD prevalence since clinical-based studies usually include limited portions of gender non-congruent individuals. GD prevalence is highly variable geographically. Lacking precise geographic data is another limitation of this study. Despite the fact that 80% of TriNetX data are from the USA, the other 20% are scattered internationally among many countries. We were also not able to analyse the study subjects by race or ethnicity. An additional limitation is the possible sex assigned at birth misclassification in the TriNetX database. It was unclear if patients’ gender in the electronic healthcare records (EMR) represented their sex assigned at
birth or their identified gender. Since sex assigned at birth carries a higher weight biologically when it comes to medical decisions, we believe most EMR systems still register patients with their sex assigned at birth. Thereby the effect of misclassification is minimal. Due to the limitations listed above, we only emphasise the temporary change as a trend in sex assigned at birth and age.

**CONCLUSION**

Our study demonstrated a climbing prevalence of GD, especially in AFABs. While further studies are warranted to determine the persistence of the diagnosis, we encourage youth to explore their gender identity with a non-binary stance, educate the public on gender diversity, and call upon clinicians to provide timely assessment for children and youth with GD concerns.

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**Contributors** C-FS designed the study and collected the data. C-FS and VM conceived and wrote the manuscript. HX and MSH analysed the data and supported the methodology writing. JHD, YL and ASK provided proofreading and review for the manuscript.

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**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Research data supporting this publication are available from the TriNetX Research Network located at https://trinetx.com/

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Age of those with mismatched biological sex and gender identity is falling

And it’s lower for those assigned female sex at birth than those assigned male

The age of those who are distressed because of a mismatch between their biological sex and their gender identity—known as gender dysphoria—has been steadily falling, reveals research published in the open access journal General Psychiatry.

And it’s lower for those assigned female sex at birth than those assigned male, the findings indicate.

Recent studies suggest that gender dysphoria is becoming more common, particularly among those assigned female sex at birth. But these studies have been hampered by small sample sizes, short monitoring periods, or outdated datasets.

In a bid to get round these limitations, the researchers drew on data submitted to the TriNetX database Research Network from 49 healthcare organisations between 30 April 2017 and 30 April 2022 inclusive.

This database holds the anonymised medical records of around 66 million people, most of whom (80%) live in the USA.

The researchers focused on 42 million 4-65 year olds, 66,078 of whom were diagnosed with gender dysphoria—equivalent to 155 people per 100,000 of the population.

Their average age was 26 (27 for those assigned female sex at birth; 30 for those assigned male sex). And they were more likely to have been assigned female sex at birth—58% vs 55%.

The estimated prevalence of gender dysphoria rose significantly between 2017 and 2021, while the average age of those diagnosed with it fell from 31 in 2017 to 26 in 2021.

But the increasing trend of a gender dysphoria diagnosis among those assigned female sex at birth was significantly more rapid than that of those assigned male sex at birth, before the age of 22.

The estimated prevalence of gender dysphoria among those assigned female sex at birth rose sharply at the age of 11, peaked between the ages of 17 and 19, and then fell below that of those assigned male sex at birth, by the age of 22.

This compares with the estimated prevalence of gender dysphoria among those assigned male sex at birth which started to increase at the age of 13, peaked at the age of 23, and then gradually decreased.
The timing of puberty might explain the different patterns of gender dysphoria by sex, suggest the researchers, as girls generally enter this before boys, and it’s at puberty that young people tend to seek medical help for gender issues.

Social attitudes may also have a role, they add, with school-age masculine girls with gender dysphoria more likely to be accepted by their peers and feminine boys in the same situation more likely to face bullying and rejection.

As to the increase in the numbers of those with gender dysphoria, wider availability of specialist clinics and growing awareness and acceptance of gender diversity might explain these trends, the researchers suggest.

“Gender identity development heavily leans on social processes, including exploration and experimentation with external feedback. There is now increasing acceptance of gender-neutral pronouns and gender-non-congruent chosen names,” they write.

But the researchers acknowledge that only 20% of participants came from countries other than the USA, which may limit the wider applicability of their findings.