**Onset Age as a Predictor of Mental Health Problems in Adolescents with Gender Dysphoria**

**Abstract**

Gender dysphoria (GD) in adolescents is often associated with high psychopathological distress. Increasing rates of onset and growing heterogeneity within this group provide evidence for distinct developmental trajectories and potentially different treatment needs. However, little is known about the onset age of GD, whether early (early onset [EO]) or late (late-onset [LO]), and its significance for mental health problems. Here, we examine the frequency of EO vs. LO courses and the association between onset age and psychological distress in adolescents with GD. The sample comprised 462 adolescents with a diagnosis of GD who presented to the Hamburg Special Outpatient Clinic for Gender Dysphoria between 2013 and 2021. We assessed onset age (EO vs. LO) using the DSM-5 criteria of GD and psychological distress using the Youth Self-Report. Overall, 51% (*n* = 237) of youths with GD had an EO and 49% (*n* = 225) had a LO. There was a significant association between onset age and psychological distress, with LO associated with particularly high distress from internalizing problems. LO GD was also associated with more severe peer problems, opposite-sex or asexual orientation, and only moderate cross-gender identification. In conclusion, our findings emphasize that adolescents with LO GD represent a particularly distressed and vulnerable group whose needs should be considered more closely, both diagnostically and treatment-wise. A protocol-based approach to the indication for physical medicine measures can no longer adequately meet the current clinical courses and should be supplemented by a differentiated approach oriented to adolescent developmental dynamics.

Keywords

**Introduction**

The current controversial debate among clinicians and researchers about gender dysphoria (GD) in adolescence is based on observations that raise more questions than provide answers: worldwide, specialized centers are showing increasing rates of presentation of predominantly biologically female adolescents who consider themselves transmasculine and seek body-modifying interventions (Aitken et al., 2015; Chen et al., 2016; de Graaf et al., 2018, 2021; Kaltiala-Heino et al., 2015; Levitan et al., 2019) or who consider themselves nonbinary, beyond the established gender dualism of male or female (Chew et al., 2020; Hermann et al., 2022, 2023). Similarly, a cluster of adolescents has been reported in the United States and Canada who, after gender-conforming development in childhood, first show GD in puberty (Hutchinson et al., 2020; Zucker, 2019) and have a high burden of associated psychopathology (Becerra-Culqui et al., 2018; Strang et al., 2018; Thrower et al., 2020).

Overall, the significant increase in treatment numbers worldwide (Thompson et al., 2022; Zhang et al., 2020) and the often polarizing reception of these phenomena has led to buzzword-like reductions of the situation in the media to a conflict between trans hype and self-liberation, with satisfactory explanations lacking so far.

In the meantime, attempts are being made to identify distinct developmental pathways in the spectrum of increasingly heterogeneous processes. In addition to the rapid-onset GD (ROGD) phenomenon (Littmann, 2018), which describes a sudden onset of GD without any previously recognizable clues, other differentiations based on the duration of GD and age at first presentation (Arnoldussen et al., 2022; Sorbara et al., 2021) are also gaining importance. Similarly, it is useful to differentiate based on onset age (OA), which describes a model for the early or late onset of GD. OA has recently gained additional relevance because previous treatment and follow-up data, which served as evidence to support recommendations for the early use of gender reassignment surgery, no longer seem relevant for our current clientele, as recently critically discussed by Abbruzzese et al. (2023).

The effort to differentiate novel developmental trajectories illustrates the ethical dilemma for practitioners, who must balance the well-founded concern about false indications and the thus far unclear and dreaded detransition rates (Cohn, 2023) with the simultaneous attempts to minimize the distress of those affected by persistent GD through gender reassignment interventions, as recommended, for example, by the current Standards of Care (SOC-8) of the World Professional Association for Transgender Health (WPATH) (Coleman et al., 2022).

A close look at new developmental pathways in the heterogeneous spectrum of self-definitions can help to enable differentiated and individualized treatment planning and thereby guarantee safe indications for the appropriate treatment.

**Definition and Diagnosis of GD**

GD describes distress at a perceived discrepancy between one’s perceived identity and physical sex characteristics, as well as the associated social gender role. Operationalized, the experienced gender identity is most often expressed by designating the sex assigned at birth as trans-female (assigned male at birth [AMAB]) or trans-male (assigned female at birth [AFAB]) (American Psychiatric Association [APA], 2015).

Most adolescents who turn to specialized centers express the desire for physical medicine measures, in the sense of hormone substitution. A distinction must be made between explicit prerequisites, such as a clinical diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (American Psychiatric Association, 2013) or International Classification of Diseases, Tenth Edition (ICD-10) (World Health Organization, 2019), and implicit prerequisites for an indication, as formulated by SOC-8 (WPAH, 2022) or established treatment protocols (de Vries et al., 2011, 2014). An approach based on the “Dutch Protocol” (Cohen-Kettenis et al., 2003, 2015) has become established in Europe in the last 20 years. This protocol formulates strict entry criteria, such as a retrospective opposite-sex identification going back to childhood (i.e., prepuberty), also known as an EO course (de Vries et al., 2011). In addition, a homogeneous and largely psychopathologically low-stress treatment group has been identified. In the absence of EO GD and concomitant psychopathology, it was almost impossible for these adolescents to receive gender reassignment treatment (de Vries et al., 2012). Just recently has the presence of EO GD been formulated more flexibly as a criterion in the SOC-8 (Colemann et al., 2022) in favor of *longer-lasting and consistent GD*, and it is no longer a basic requirement for the indication for physical medicine treatment.

While catamnestic studies of the Dutch cohort showed a clear improvement in the psychological well-being of the treatment group (de Vries et al., 2014), the same improvement could not be clearly demonstrated in a much more heterogeneous sample from Germany (Becker-Hebly & Richter-Appelt, 2018; Becker-Hebly et al., 2021), whose selection was not selectively based on a protocol and that also included late-onset (LO) courses. In this respect, it must be asked in general whether, given the growing diversity of developmental trajectories, a protocol-based treatment approach can still meet the requirements.

**Onset Age**

Early- and late-onset GD (Lawrence, 2010; Person and Ovesey, 1974) are descriptions of the time of the initial manifestation (OA) of GD. EO manifests in childhood, always before puberty, and is often accompanied by an early gender role change. LO GD, on the other hand, manifests later, after the initiation or completion of puberty, and is therefore considered more difficult to diagnose because most affected individuals have already lived in their biological sex for a longer period of time, often without externally recognizable signs of distress. The OA of GD has been considered a marker of diagnostic certainty in the context of an indication for physical medicine interventions in adolescents, although there are no follow-up data on the persistence of LO GD in the literature.

Researchers have recently attempted to quantitatively capture the growing heterogeneity of the clientele and the associated, and presumably distinct, developmental trajectories (Sorbara et al., 2021; Arnoldussen et al., 2022) by distinguishing between the temporal duration of GD and the age group at the initial presentation. Initial results from the Netherlands (Arnoldussen et al., 2022) showed that older adolescents (younger than 14 years vs. 14 years or older at initial presentation) had an overrepresentation of birth-assigned females and greater body-related dissatisfaction, whereas the younger group was more likely to have evidence of gender-nonconforming childhood behavior and more likely to have an indication for gender reassignment procedures. Sorbara et al. (2021) compared the younger than and older than 15-year-old age groups and found that the older group of adolescents at initial presentation was significantly more psychopathologically distressed and that adolescents presenting younger were significantly more likely to notice their gender incongruence earlier. Without explicitly capturing OA as a variable in the studies, both findings indicate that older adolescents were more likely to be of female-assigned sex at first presentation and were more severely and frequently psychologically distressed than younger adolescents.

While the OA of gender dysphoric experience is a descriptive description along the timeline, the conceptualization of ROGD (Littmann, 2018, 2020, 2021) has been controversial, due to its etiological assumptions. ROGD is understood to be the sudden and surprising onset of GD without any pre-recognizable signs, predominantly in female-born adolescents. This is usually accompanied by high psychopathological distress in the affected individuals and is associated with a strong desire for rapid physical medical treatment. Littmann (2018, 2021) defined ROGD as a subtype of GD and suggested that gender dysphoric distress resulted less from a persistent and profound opposite-sex identification and more from an expression of a different psychological problem. She reported an association between psychological distress and ROGD (76% of respondents had one or more mental disorder diagnoses) and the absence of early signs of GD in childhood. However, statistical analysis by frequency did not allow conclusions about causality. In addition, all data were collected exclusively utilizing third-party assessment by parents who were critical of transgender issues. Turban et al. (2023), who attempted to test Littmann’s assumptions, came to different conclusions: they distinguished between early realization of GD (under 10 years of age) and late realization of GD (10 years and older) and found that the two groups did not differ in the extent of psychological distress, with the older group even reporting less distress from suicidal ideation.

**Current Clinical Impressions and Courses**

In addition to the “classic” EO developmental trajectories with a social role change already in childhood, little to barely any distress until expected puberty, and a predominantly male referral gender in terms of numbers, we now see a shifted gender ratio in adolescence in the Hamburg special outpatient clinic (84% AFAB vs. 16% AMAB; Hartig et al., 2022; Herrmann et al., 2022; Levitan et al., 2019), with some clinical peculiarities. Briefly, a high number of adolescents report strong and persistent distress about their sex characteristics, with previously psychosexually inconspicuous puberty. In most cases, etiologically unclear psychopathology with social fear, depressive withdrawal, and self-injuries accompanies this course and often precedes it. Inpatient psychiatric treatments are frequently found in case histories. Here, too, the psychological distress is usually considerable and must always be taken seriously, but it is highly probable that it has many other origins than GD alone.

In addition, we encounter partial GD in adolescents with female-assigned sex: here, often only one specific body feature (mostly the breast) is in the foreground, which should be changed at all costs. The self-definition as a trans male is often intellectually derived from the deep feeling of not being able to be female.

As a third line of progression, we encounter young adolescents in early puberty who, in addition to a contrary-sex or nonbinary identification, have enormous fears of the demands and tasks of the adolescent developmental phase and whose GD first appeared in connection with the feeling of not yet being able to meet these demands. In this group, adolescents are frequently found who hardly participate in social life, show only little interest in contact with peers, and are also clearly inhibited in other areas of identity.

**Psychological Distress**

Studies from different countries suggest that more than half of children and adolescents with a GD diagnosis also have at least one other psychiatric diagnosis (Becker et al., 2014; Chen et al., 2016; 2017; Chodzen et al., 2019; Di Ceglie et al., 2002; Hewitt et al., 2012; Holt et al., 2016; Kaltiala-Heino et al., 2015; Katchadourian et al., 2014; Meyenburg, 2020; Nahata et al., 2017; Spack et al., 2012). For example, Kaltiala-Heino et al. (2015) reported at least one preexisting or current mental health disorder in 75% of the youths in their study. Significantly overrepresented compared to the normal sample in the German studies are also affective and anxiety disorders, self-injurious behavior, suicidal ideation, and suicidal acts (Becker et al., 2014; Hartig et al., 2022; Levitan et al., 2019), both in childhood and adolescence (Becker et al., 2018). De Graaf et al. (2022) found consistently elevated rates among female-assigned adolescents in addition to an overall elevated incidence of suicidality among transgender adolescents from the Netherlands, Canada, and the United Kingdom.

Questionnaire assessments, mostly conducted with the Child Behavior Checklist (CBCL) or the adolescent version of the CBCL, the Youth Self-Report (YSR) (Achenbach, 1991b), consistently show elevated levels of psychological abnormalities in the clinically relevant range, regardless of the assigned sex (Bechard et al., 2017; de Graaf et al., 2019; de Vries et al., 2016; Levitan et al., 2019; Zucker et al., 2012). For example, 45% to 82% of adolescents show internalizing symptoms such as anxious-depressive moods, social withdrawal behaviors, and somatization tendencies, as well as externalizing abnormalities such as impulse control disorders. Across different countries, there was a clear predominance of internalizing disorders over externalizing problems (Cohen-Kettenis et al., 2003; de Graaf et al., 2018; de Vries et al., 2016; Levitan et al., 2019; Röder et al., 2018; Sievert et al., 2020), from which it can be hypothesized that adolescents with GD have higher levels of anxiety, depressive, and somatic complaints, with fewer aggressive-impulsive problems from the externalizing spectrum in comparison.

Furthermore, there is evidence of the importance of peer relationships and family support as key protective factors for psychological well-being. Negative experiences with peers emerged as the most important predictor of psychological distress (Aitken et al., 2016; de Graaf et al., 2018; de Vries et al., 2016; Levitan et al., 2020; Sievert et al., 2020; Steensma et al., 2014), assuming that problematic peer relationships (PPRs) may also be an expression of increased psychosocial problems in general and, as a consequence, increased mental health problems. Although cause and effect are not yet sufficiently understood, adolescents with GD have been identified as being particularly vulnerable to experiences of discrimination and rejection by peers (Toomey et al., 2010) and within the family (Grossman and D’Augelli, 2007).

In addition to OA, various attempts have been made to classify GD subgroups based on sexual orientation (SO) (Lawrence, 2010; Nieder et al., 2011; Blanchard et al., 1987). This was based on the assumption that the original “true transsexualism” (Benjamin, 1966) had to be accompanied by an opposite-sex/heterosexual orientation (after gender reassignment). From a developmental dynamic perspective, the aspect of SO is interesting less as an attempt at subtyping than as an expression of consolidation of adolescent notions of identity and their testing in interpersonal space and thus corresponds primarily with the quality of peer relationships. A differentiated clarity on sexual attraction as well as sexual activity in the sense of “trying oneself out” can influence mental health in adolescence, in line with the findings of Levitan et al. (2019) on the relationship between PPRs and psychological distress.

**Summary and Derivation of the Research Question**

Previous research suggests that the differentiation of subgroups of adolescents with GD may improve our understanding of heterogeneous developmental pathways and enable more individualized treatment steps and services. This seems particularly necessary given the increasingly variable manifestations, and different derived needs, that find little place in current treatment protocols. Therefore, the present study is the first to systematically record a large sample of adolescents with GD concerning their clinical characteristics of OA and psychological distress in the German-speaking world. Despite the existence of numerous clinical hypotheses, which essentially refer to cause-effect relationships, there is still a lack of differentiating quantitative studies investigating the relationship between OA and psychological distress in adolescents and controlling for other possible influencing factors, such as assigned sex, age, intensity of GD, body satisfaction, PPRs, family functioning level, and SO.

Therefore, the following three research questions will be answered in this article:

1. What is the distribution of OA among adolescents with GD presenting to a specialized consultation?

2. What is the prevalence of clinically relevant problems in clinically presenting adolescents with GD (compared to the normal sample) and what is the nature of the psychological distress?

3. What is the relationship between OA and internalizing problems in clinically presenting youth with GD?

Based on previous research, we hypothesize that a LO would be related to more internalizing problems.

**Method**

**Project Framework and Study Design**

A special outpatient clinic for GD in childhood and adolescence (Hamburg Gender Identity Service for Children and Adolescents, Hamburg GIS) has been located at the University Medical Center Hamburg Eppendorf (UKE) since 2006. Following current treatment guidelines (cf. AMWF, 2020; Coleman et al., 2022), in addition to diagnostics and psychotherapeutic treatment, indications for gender reassignment measures also take place at this clinic. Since 2013, all presenting families have been invited to participate in a study at the Hamburg GIS. Participation is voluntary and data collection takes place at the first appointment, before the start of a diagnostic phase, and any use of physical medicine measures. An ethics application for the research project was approved by the Hamburg Chamber of Psychotherapists. The study follows a cross-sectional design with the use of internationally established, psychometrically tested, questionnaires (self-reported) and expert ratings.

**Sample**

The current study examined adolescents who presented to the specialty outpatient clinic between September 2013 and December 2021 and met diagnostic criteria for GD according to the DSM-5 (American Psychological Association, 2013). All diagnoses were rated by clinical experts using standardized diagnostic checklists after a diagnostic period of several months. Because the DSM-5 sets a cutoff between the diagnostic classification of childhood vs. adolescence based on age at 11 years, this criterion was adopted and all participants were accordingly 11 years or older. The utilization population comprised a total of 1122 children and adolescents from all northern German states during the survey period. A total of 631 complete data sets were available from the survey. For various reasons, 169 cases had to be excluded (Fig. 1). Thus, the present study included the complete data of 462 adolescents aged 11–18 years with a GD diagnosis and their families.

**Sociodemographics and Onset Age**

The following sociodemographic characteristics were included in the analyses: assigned sex, age at first presentation, nationality, and parents’ marital status, living situation, and socioeconomic status (SES) (for a detailed description, see Levitan et al., 2019, and Herrmann et al., 2023).

In addition, cross-gender identification (experiences of belonging to the “opposite” gender) was recorded for all participants using a sum score identified in previous studies (e.g., de Vries et al., 2016): in the YSR, Items 5 and 110 refer to opposite-sex experiences (“I act like someone of the opposite sex” and “I would like to belong to the opposite sex”). The sum score of the two items can be used as a measure of the intensity of gender incongruence (given a binary understanding of gender identity). The score ranges from 0 to 4, with larger values expressing a higher intensity of gender incongruence.

OA was operationalized by dichotomous assignment to EO GD if the DSM diagnosis of GD was already applicable in childhood or to LO GD in participants who retrospectively did not meet the criteria for GD in childhood but did in adolescence. Thus, two groups of participants emerged: 0) EO (met DSM-5 criteria of GD in both childhood and adolescence) and 1) LO (met DSM-5 criteria of GD only in adolescence). In additional exploratory analyses, we subdivided the LO group by GD duration and labeled all participants whose GD had been present for less than 1 year as ROGD.

**Psychological Distress**

Internalizing problems were assessed with the 1991 German version of the YSR (Achenbach, 1991b; Döpfner et al., 1998) for adolescents aged 11–18 years. The YSR comprises 120 items rated on a 3-point scale ranging from 0 = “not true” to 2 = “true exactly or often”. The higher the score, the more pronounced the respective problems. The total sum of all problem scores is reflected in the total problem score, in which two main scales can be differentiated (internalizing and externalizing problems). In addition, values in the clinical range (>90th percentile; T scores > 63) can be given for these three indices. Normal values of adolescents (aged 11–18 years) from the German general population are available for the different indices and assigned sexes (Döpfner et al., 1998). These normal or T values can be used to determine whether the values of our sample are within the normal range. Cronbach’s α for the internalizing scale was 0.91.

For exploratory purposes, the YSR score for externalizing problems and the total problem score were also calculated to examine psychological functioning more broadly. For more information on the calculation of these two indices, see Levitan et al. (2019) or Herrmann et al. (2023). In this study, Cronbach’s α for the externalizing and total problem scales was 0.83 and 0.93, respectively.

The Children’s Global Assessment Scale (CGAS) (Shaffer et al., 1983) was used within the exploratory analyses to assess adolescent global functioning using treatment ratings. The CGAS is one of the most widely used assessment scales for measuring everyday functioning in children and adolescents (Schorre et al., 2004). The instrument is divided into 10-point intervals ranging from 10 to 100, with higher scores (above 80) indicating good global functioning.

**Control Variables**

SO was assessed with a self-developed item asking about physical (sexual) attraction in partner choice (“To whom are you more physically [sexually] attracted?”) and providing six response categories: “to no one”, “to girls”, “more to girls, sometimes to boys”, “to both girls and boys”, “to boys”, and “other” (free text response). From these, three categories of SO were formed in relation to assigned sex: 0) Same-sex/homosexual, 1) Opposite-sex/heterosexual, and 2) Other. The “Other” category was screened and three subgroups were formed: asexual/uncertain, bisexual, and pansexual.

Three items from the YSR were used to assess PPRs: Item 25 (“I do not get along with other children or adolescents”), Item 38 (“I am often teased”), and Item 48 (“I am not popular with other children/adolescents”). The PPR has been used in previous studies to measure PPRs in youths with GD (Levitan et al., 2019; Sievert et al., 2021). The index ranges from 0 to 6, with higher scores reflecting poorer relationships with peers. In the present study, Cronbach’s α was 0.66.

For general family functioning (GFF), the McMasters’ Family Assessment Device (FAD) (Epstein et al., 1983) was used. Only the GFF subscale was evaluated. The GFF scale comprises 12 items, such as family acceptance (“Everyone is accepted as they are”), rated on a 4-point scale (from 1 = “agrees exactly” to 4 = “does not agree at all”). The sum of the 12 items was divided by 12 to create a score ranging from 1 to 4, with higher scores indicating lower levels of family functioning. The cutoff for categorical analyses (problematic or unhealthy family functioning) is 2.17 (Byles et al., 1988). Cronbach’s α was 0.88 in the present sample.

The pictorial measure Hamburg Body Drawing Scale (HBDS) was used to assess body satisfaction (Appelt & Strauß, 1988; Becker et al., 2016). Participants were asked to rate their satisfaction with various body features and overall appearance on a 5-point scale (from 1 = “very dissatisfied” to 5 = “very satisfied”). The HBDS has been revised and validated for transgender populations (Becker et al., 2016). Internal consistency for the HBDS subscales (Cronbach’s α = 0.63–0.91) is satisfactory (Becker et al., 2016). In the present study, only one item on general body satisfaction was used.

**Statistical Analysis**

Confidence intervals (95% CIs) were calculated for the prevalence of EO and LO GD. To examine differences between groups (OA and assigned sex) or associations, t-tests, and chi-square tests were performed, respectively. Standardized effect sizes (Cohen’s d and odds ratios [ORs]) were calculated to quantify the magnitude of the effect.

Internalizing problems were assessed using raw scores, T scores, and clinical ranges (>90th percentile; T scores > 63). In addition, confidence intervals for T scores were calculated to compare the present sample with the age- and sex-equivalent German norm (Döpfner et al., 1998). Whenever the CIs were not within the normal range of the T-distribution (*M* = 50, *SD* = 10), a significant difference from the reference group can be assumed. When the CIs overlapped, the results were not significantly different from each other (Cumming & Finch, 2005). For exploratory purposes, the externalizing scale and total problem score were also evaluated as presented.

Multiple linear regression analysis was performed to examine the predictive value of OA for internalizing problems. For this purpose, the raw scores of the YSR internalizing scale were used, and we controlled for assigned sex, age, PPRs, GFF, SO, body satisfaction, and cross-gender identification. In the exploratory analyses, the same approach was used to examine the associations of OA with externalizing problems and the total problem score. For the total problem score, three items on PPRs (Items 25, 38, and 48) were also excluded because PPRs were a separate predictor in the model. An a priori power analysis (using G\*Power) showed that a small effect (f = 0.02) with a power of 85% could be tested in a multiple regression analysis with 462 cases and eight predictors.

In the exploratory analyses, multiple linear regression was also conducted to examine the association between OA (independent variable) and global functionality (dependent variable). The control variables described above were used.

Individual missing values were replaced using the expectation maximization algorithm (Little & Rubin, 2019). All statistical analyses were performed using SPSS version 27.

**Results**

**Description of the Sample**

Table 1 shows the sociodemographic and clinical characteristics of the participants. The sample (*n* = 462) comprised 85% female and 15% male adolescents with a mean age of 15.5 years. EO GD was present in 51% of participants and LO GD in 49%; the second group was significantly older at the initial presentation. There was no association between assigned sex and OA.

Almost all adolescents were German citizens and came from a family with medium or high SES. Participants with LO GD had a significantly higher SES than participants with EO GD.

When asked about problems with peers in the last 6 months, significantly more LO adolescents reported at least one relevant problem, in significant contrast to EO adolescents. The GFF subscale also showed that LO adolescents experienced problematic family relationships significantly more often than EO adolescents. Furthermore, EO and LO adolescents differed in the intensity of GD experienced: it was significantly more pronounced in EO adolescents than in LO adolescents. No difference was found between the two groups in body satisfaction, which was on average very low, regardless of OA.

In the group of LO adolescents, the duration of the experienced GD was additionally examined. Between 23% and 36% of the adolescents met the criteria for ROGD and reported that the onset of GD was less than 1 year ago (Table 2).

In terms of SO, half of the participants (in relation to gender assignment) located themselves as same-sex oriented and about a quarter considered themselves opposite-sex oriented. Significantly more EO youth (63%) were same-sex-oriented than LO youth (30%); the latter were typically opposite-sex oriented or bisexual.

**Internalizing Problems**

Results for internalizing problems are presented in Table 3. Compared with the German normal population (*M* = 50, *SD* = 10), adolescents with GD had significantly higher T scores (95% CI without *M* = 50) for internalizing problems. Adolescents with GD scored on average more than 1.5 SDs higher on the internalizing problems scale than peers from the YSR reference group.

Regarding OA, LO GD adolescents were significantly more burdened with internalizing problems than EO GD adolescents. The former had 67% in the clinically salient range, whereas 49% of the latter had clinically salient scores (T scores > 63). Overall, 58% of adolescents in the sample had clinically relevant levels of distress.

**Onset Age and Internalizing Problems**

The results of multiple linear regression testing of our hypothesis are shown in Table 4. The regression analysis revealed a significant relationship between OA and internalizing problems. As hypothesized, the score of the LO GD group was three points higher for internalizing problems in the YSR. With respect to the control variables, more internalizing problems were significantly related to gender (female-assigned sex), SO (non-same-sex SO), PPRs (poorer peer relationships), GFF (poorer family functioning level), and body satisfaction (lower body satisfaction).

Overall, the model resolved 44.5% of the variance in internalizing problems: OA resolved 1.5% of the variance and the control variables resolved a total of 43%.

**Exploratory Data Analyses: Onset Age, Externalizing Problems, and Level of Functioning**

Exploratory data analyses were conducted to examine the associations between OA and externalizing problems, as well as the total problem score and mental functioning level (CGAS) (Appendix Tables A1–A4).

Externalizing problems were less common than internalizing problems in adolescents with GD but were still elevated compared with the normal sample (Table A1). Clinically relevant externalizing problems were reported by 14.5% of participants. There were no significant differences between EO and LO youth. Also elevated was the total problem score: youths with GD scored more than 1 SD higher than the reference group and 46% of participants were in the clinically salient range. LO adolescents were significantly more clinically distressed and tended to be more clinically distressed than EO adolescents. There was also a significant difference in the global level of functioning between the two groups, with LO adolescents having a lower level of functioning.

In multiple regression analysis for externalizing problems, a significant relationship was identified between OA and externalizing problems (Table A2). An inverse relationship was found compared with internalizing problems, that is, LO adolescents were burdened with fewer externalizing problems. Significant control variables were assigned sex, PPRs, and GFF. The model resolved only 16% of the variance in externalizing problems: OA resolved 1% of the variance and the control variables resolved 15%.

Another regression model (Table A3) tested whether OA affected the total problem score and global functioning level. OA and total problem score were not related. Significant control variables were assigned sex, PPRs, GFF, and body satisfaction. The model resolved 39% of the variance in the total problem score.

Table A4 shows the results for the association between OA and the global functional level. LO proved to be a significant predictor of a worse global functional level. Significant control variables were PPRs and GD intensity. The model resolved 11.6% of the variance in the CGAS: OA resolved 2.2% and the control variables resolved 9.4%.

Last, we explored whether OA was related to internalizing problems when the Recent Onset and LO groups were considered separately (Table A5). Belonging to the LO group was related to significantly higher psychological distress from internalizing problems. Belonging to the Recent Onset group was not related to more internalizing problems but showed a tendency to do so. Significant control variables were assigned sex, PPRs, GFF, body satisfaction, and SO. The model explained a total of 44.5% of the variance in internalizing problems, of which OA accounted for 1.4% and the control variables for 43.1%.

**Discussion**

The present study aimed to assess the frequency of EO vs. LO courses and to investigate the association between the OA of GD and psychological distress in adolescents attending a specialized outpatient clinic for GD. Our findings identified OA as a significant predictor of psychological distress, with LO GD in adolescence associated with a particularly high burden of internalizing problems. We also found numerous relevant differences in sociodemographic and clinical characteristics between EO and LO adolescents (age at first presentation, SES, PPRs, GFF, cross-gender identification, and SO).

The greater burden of the LO group corresponds to recent findings in which a group classification was made on the basis of the age of presentation (Arnoldussen et al., 2022) and pubertal developmental stages and first self-perception of GD (Sorbara et al., 2021). In each case, the older study group showed a greater psychological burden. In this context, older age at first presentation and an associated longer duration of GD is usually understood as an expression of reactive distress or, under certain circumstances, harmful experiences of discrimination. In contrast, our EO and LO groups differed only insignificantly in age (15.2 years to 15.7 years at first presentation). In addition, we found that a longer duration of GD with onset already in childhood (EO) was *not* associated with a greater burden, in contrast to previous findings.

This is also supported by the results that we found exploratively for adolescents with ROGD: despite the short duration of the gender dysphoric experience (less than 1 year), they showed a similar or even greater burden of internalizing problems than the rest of the LO group. A more recent study by Turban et al. (2023), which retrospectively asked adults about the age of realization of GD (subdivided into less than 10 years or childhood and more than 10 years or later realization), found a roughly even distribution of OA but, contrary to our findings, an older group significantly less burdened with suicidal thoughts and no differences between groups in overall psychological burden.

Contrary to expectations, the gender ratio did not differ between the EO and LO groups but was balanced with a share of 86% and 84% AFAB, respectively. In this respect, it cannot be assumed that the LO group shows an overrepresentation of adolescents with female-assigned sex. However, physical maturational development and the fact that girls enter puberty much earlier than boys and usually develop recognizable secondary sexual characteristics well before the age of 12 years (Grüters-Kieslich, 2009) could explain why there were more adolescents with female-assigned sex in the EO group. In this context, it is interesting to note that the EO group reported a greater intensity of GD and opposite-sex identification with otherwise lower exposure. This could correspond to the assumption of Cohen-Kettenis and Klink (2015) that there is a clinical subtype of female-born adolescents with an EO course and exceptionally strong GD who have an early desire for physical medical treatment. At the same time, however, this also shows that GD with high intensity and suffering pressure does not necessarily have to be connected to strong internalizing problems but exhibits different or independent developmental pathways under certain circumstances. A clinical approach to understanding seems to be urgently required to more precisely describe these courses and to be able to make well-founded treatment decisions on this basis.

Causal inferences are limited by the fact that, in the Hamburg sample, the proportion of AFAB youth continues to trend upward: from the last data collection in December 2018 (see, e.g., Levitan, 2019) to our current survey in December 2021, the proportion of AFAB in the overall sample changed from 74% to 85%. Thus, our sample differs significantly from the Dutch cohort, in which the sex ratio changed only marginally in the long-term (de Graaf et al., 2018; Arnoldussen et al., 2022).

Considering the findings of previous studies of OA, a dynamic developmental link between female-assigned sex and LO GD was suggested but not shown in our study. Nieder et al. (2011) reported an EO rate of 78% in an adolescent sample of AFAB individuals presenting to specialized European gender reassignment centers. In contrast, our EO proportion of 51% is not only significantly lower, but also contrary to the notion that increased societal openness and information diversity about transgender people might result in an earlier age-related reflection on the potential discrepancy between body sex and identity experience (e.g., Aitken et al., 2015). Rather, contrary to this expectation, there appears to be a temporal shift to later adolescence, when the incongruence is first perceived.

However, it is possible that the decrease in stereotypical role expectations and evolved possibilities of expression can also be understood ambiguously: while this is associated in some with relief from gender templates and more individual freedom, it may lead others to a loss of orientation and the search for new identifications to counteract the insecurity. In both possibilities, the unresolved question arises as to how it is possible to experience puberty without a subjectively noticed pressure of suffering in the case of a LO GD and how it generally leads to the development of dysphoria.

Moreover, given the high burden of internalizing problems and a tendency to withdraw from real interactions with peers in favor of social media and LGBT community contacts (Hermann et al., 2023), it seems rather questionable whether a creative and individual shaping of gender-nonconforming experiences is possible at all. It can be assumed that an examination of one’s own gender identity experience takes place not only in young people themselves but increasingly also in virtual interactions with social media protagonists.

Another interesting finding was revealed in the differences in SO between the EO and LO groups and the dominance of a same-sex orientation (EO) over an opposite-sex/other orientation (LO). When SO is viewed less as an etiological indicator (see, e.g., Blanchard et al., 1987), as it has been in the past, and more in terms of its interpersonal relations, a link to the pronounced problems in peer relationships becomes apparent. The high variance in SO within the LO group is accompanied by stronger problems in peer relationships. Both the strained relationships and an unclear, only barely tested, sexuality, as described by Bungener et al. (2017) and Stübler and Becker-Hebly (2017), can significantly complicate a consolidation of adolescent identity ideas, as well as lead to a retreat from explorative and progressive adolescent desires and consolidate persistent insecurity instead of enabling lively testing.

Strained peer relationships, ambiguity about one’s sexual attraction, strong body-related dissatisfaction, and limited family support among LO adolescents directly indicate the high symptomatic distress of this group. Identity is a process essentially determined by interactions (Mertens, 1993), both between the individual and relevant others and within the self in the process of reflecting on and testing different conceptions of self. A consolidated and stable experience of identity, also with regard to a mature clarity about one’s own gender identity, is accordingly clearly more difficult for individuals with high symptomatic stress and conflictual relationships with peers. It can be assumed from this that LO adolescents represent a particularly vulnerable group that would benefit from an individually tailored treatment program, in addition to long-term psychotherapeutic support that can help them to consolidate their own identity experience and create space for development again.

**Clinical Implications**

Our results raise three major questions: 1) is there a clinical LO subtype?; 2) on what basis or under what conditions can reliable physical medical indication decisions be made?; and 3) can a protocol-based approach still meet the needs of individuals seeking treatment given the diversity of courses and the different developmental pathways that can be derived from them?

First, the present findings indicate the presence of increasing heterogeneity not only in clinical course observations of treatment-seekers, but also within the sample between EO and LO courses. In the results, the LO group was significantly more psychologically distressed, with more pronounced peer problems, opposite-sex or asexual orientation, and only moderate cross-gender identification. Other influences are likely since neither the duration of the gender dysphoric experience nor the intensity of cross-gender identification can be convincingly assumed to be causal for the overall very high psychological distress.

Drawing on the clinical manifestations briefly outlined at the beginning, we can assume that for a substantial proportion of adolescents with long psychiatric histories, LO GD will have a different developmental trajectory than a deeply felt incongruence between gender identity and body. Contrary to Littmann’s (2018) assumption, we consider a developmentally derivable transgender belief to be etiologically different in understanding, but not milder in course or less in need of treatment. Rather, the question here is what interventions would benefit this particularly vulnerable group of youth with LO GD, beyond the desire for physical medicine interventions.

Second, an indication for physical health interventions based purely on descriptive and external criteria appears neither purposeful nor feasible given the reciprocal overlap of gender dysphoric experiences and other developmental conflicts (Edwards-Leeper, 2017; Zucker and Bradley, 1995). Our proposal is therefore a comprehensive process-oriented diagnosis that includes psychosexual development, own narratives about identity development, and a detailed anamnesis for other relevant adolescent issues and conflicts. This diagnostic process would form the basis of an assessment of the course, in the context of which considerations about body-modifying measures can be discussed. A focus is placed on the interaction between GD and relevant developmental conflicts, which enables a deeper understanding of the individual path and the development of a narrative of one’s own. Accompanying psychopathology does not represent a clear contraindication for physical medical measures, as long as it can be understood in terms of developmental dynamics. Nonetheless, the psychodynamic review makes it clear that a substantial proportion of adolescents at the time of the diagnostic phase benefit less from physical medicine interventions than from adjunctive and developmental psychotherapy. Given concerns about increasing numbers of detransitions (Cohn, 2023), persistent distress despite body-modifying interventions (Roberts et al., 2022; Diaz and Bailey, 2023), and ambiguity regarding the stability of the GD experience over time, cautious and intensely reflective indications for this group of adolescents appear essential.

Third, our study group is characterized by a particularly high degree of burden with internalizing problems, particularly in comparison with other European samples (see de Graaf et al., 2018). This, as well as the shifted gender ratio toward dominance of AFAB trajectories, means that our study group is not directly comparable to the Dutch cohort from the follow-up studies. Abbruzzese et al. (2023) highlight the inapplicability of the Dutch results to heterogeneous, nonpreselected treatment groups, which include nonbinary, psychiatrically troubled youth. A normative, criteria-based approach no longer seems appropriate. The growing diversity of developmental trajectories in adolescents, with varying intensity of gender dysphoric distress and concomitant, interacting psychopathology, demonstrates the need for an individualized treatment setting. The guiding question “what works for whom, at what time, and in what setting” enables a differential indication (Dorr et al., 2020) for outpatient or inpatient psychotherapy, physical medicine measures, or low-frequency accompaniment oriented to individual needs.

**Limitations**

Our findings should be considered in light of several limitations. Data collection in the form of a cross-sectional design cannot provide information on long-term trajectories or influencing factors. This is especially true for the control variables studied, such as GD intensity, SO, and body satisfaction, which should be considered snapshots and may change over time.

Another difficulty lies in the operationalization of LO and EO trajectories. Even though retrospective assessment by expert ratings after a diagnostic process is based on adolescents’ self-descriptions, it is a selective boundary setting because the DSM-5 classification is based on age 12 years. Given the average age difference between male and female puberty and the now advanced timing of female pubertal development, the results are likely to be of limited value for some participants. For future studies, a clearer determination based on physical maturational development would be useful. For example, puberty and the associated onset of body-related complaints is a key time at which many children and adolescents with GD become aware of their own incongruence (Steensma et al., 2013).

Similarly, while the collection of psychological distress using YSR data is widespread, a categorical diagnostic using standardized questionnaires for ICD-10/-11 would be important. Another aspect that should be considered in future studies is the systematic collection of data on the course of treatment for the sample since this will make it clearer to what extent there are also differences in the indication, given the subgroups found. Additionally, it has to be stated restrictively that, with the chosen methods, the considerable variety of developmental pathways in the group of GD adolescents, as well as the possibility of further trajectories, can only be outlined and can certainly not do justice to the diversity of the population, so that clinical experience values can also only be represented statistically with difficulty.

**Conclusions**

The present study showed that about half of adolescents who attend a specialized center due to GD report a LO course. A LO course proved to be associated with a very high burden of internalizing problems, and our rates were significantly higher than those in comparable populations in other European countries.

Our findings indicate a specific subgroup of LO adolescents in the growing spectrum of heterogeneous trajectories and can be understood against the background of different etiological developmental pathways. The diverse trajectories and the presence of particularly vulnerable subgroups highlight the need to move away from a protocol-based approach toward a more individualized approach to indications that are based on developmental dynamics.

**Compliance with Ethical Standards**

Disclosure of potential conflicts of interest

Research involving Human Participants and/or Animals

Informed consent

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**Figures**

**Figure legend**

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**Tables**