



Eating Disorder Diagnoses and Symptom Presentation in Transgender Youth: a Scoping Review

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Abstract

Purpose of Review This scoping review includes recent literature on eating disorder diagnoses and evaluation of eating disorder symptom presentation among transgender youth (ages 8–25).

Recent Findings A total of 20 publications from the previous 5 years were identified, including case reports, retrospective chart reviews, and surveys. Significantly higher rates of eating disorder symptoms were documented in transgender youth compared to cisgender youth. Similarly, some studies reported transgender youth were more likely to be diagnosed with an eating disorder than cisgender youth, though the proportion of youth with eating disorder diagnoses varied across studies. A consistent theme across case studies was engagement in food restriction and/or compensatory eating behaviors to prevent puberty onset or progression, suggesting that for some transgender youth, these behaviors may be understood as a means of coping with gender-related distress.

Summary Clinical care could be enhanced through establishment of best practices for screening in settings offering eating disorder treatment and gender-affirming care, as well as greater collaboration among these programs. Research is needed to validate eating disorder measures for use with transgender youth and evaluate the effects of eating disorder treatment and gender-affirming medical interventions on the well-being of transgender youth.

Keywords Eating disorders · Eating pathology · Gender dysphoria · Transgender · Pediatric · Young adults

Introduction

The majority of research in the field of eating disorders focuses on individuals who were assigned female at birth, with

many of the measures used to assess eating disorder symptoms validated primarily with cisgender girls and women (i.e., those who whose gender aligns with their sex assigned at birth). Murray and colleagues [1] argue that classification

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systems and medical guidelines for eating disorders are “female-centric” (p. 9), leading to marginalization of other groups, including individuals assigned male at birth and transgender (trans) populations. These researchers assert the importance of considering eating disorder symptom presentation in trans individuals [1]. In this review, trans individuals are defined as those whose gender is not aligned with the sex assigned to them at birth, including transgender, non-binary, and gender diverse individuals [2].

The study of eating disorder symptoms in trans individuals is a relatively new area of research, with early case reports of trans adults with eating disorders [3, 4] and the first case report of an eating disorder in a child with gender dysphoria [5] published approximately 20 years ago. These publications coincided with the time that gender clinics were being established for pediatric populations. For example, a team at Children’s Hospital Boston has been providing treatments and supports for trans youth since 1998, and established the first North American multi-disciplinary gender identity clinic in 2007 [6]. In recent years, both Canadian and American gender clinics have noted large increases in referrals, as awareness of services and opportunities for professional development related to gender-affirming care have expanded [6, 7].

A recent systematic review highlighted the risk for disordered eating in trans individuals, a phenomenon found, in part, to be related to a desire to make changes to body shape in support of gender expression [8•]. However, the papers reviewed did not include measures to diagnose eating disorders, and only one was relevant to youth/young adults (i.e., inclusive of a sample of young adults attending college). The risk of onset of disordered eating behaviors and eating disorders is elevated during adolescence for the general population [9]. Study of eating disorder symptom presentation and eating disorder diagnosis may therefore be of particular relevance among trans youth, considering the overlap between gender-related concerns and eating disorder symptomatology (e.g., body dissatisfaction) and the stressors experienced by many trans youth (e.g., due to pubertal changes, challenges in accessing gender-affirming health care, and societal stigma) [10, 11]. Therefore, the current review was conducted to elucidate recent literature on eating disorder diagnoses and eating disorder symptom presentation among trans youth.

Methods

A scoping review following the 5-stage approach developed by Arksey and O’Malley was undertaken [12]. A scoping review maps the relevant literature in the field and is useful for identifying gaps in the existing literature [12].

Inclusion Criteria

Given the unique developmental concerns associated with adolescence and young adulthood, our review included individuals ages 8 through 25. Articles reporting on trans young people (i.e., diagnosed with gender dysphoria and/or self-identified as trans) and evaluation of either eating disorder symptoms or documentation of eating disorder diagnoses were included. The other inclusion criteria were English language; publication January 1, 2014, through June 20, 2019; and original research articles with any study design or methodology. Unpublished manuscripts, dissertations, conference abstracts, commentaries, and review articles were excluded.

Search Strategy

The online databases Ovid PubMed, Embase, PsycINFO, CINAHL, and LGBT Life with Full Text were searched. Search terms included subject headings for eating disorders and transgender/gender minorities. Please refer to the [Supplementary Materials](#) for details of search terms and strategy. The reference lists of articles that met inclusion criteria were also reviewed, as were the reference lists of four review articles identified in the database search that included references to eating disorders or disordered eating in transgender or gender minority populations in the title and/or abstract [8•, 9, 13, 14]. Forward citation chaining was done in Google Scholar to identify the articles that cited each of the selected papers.

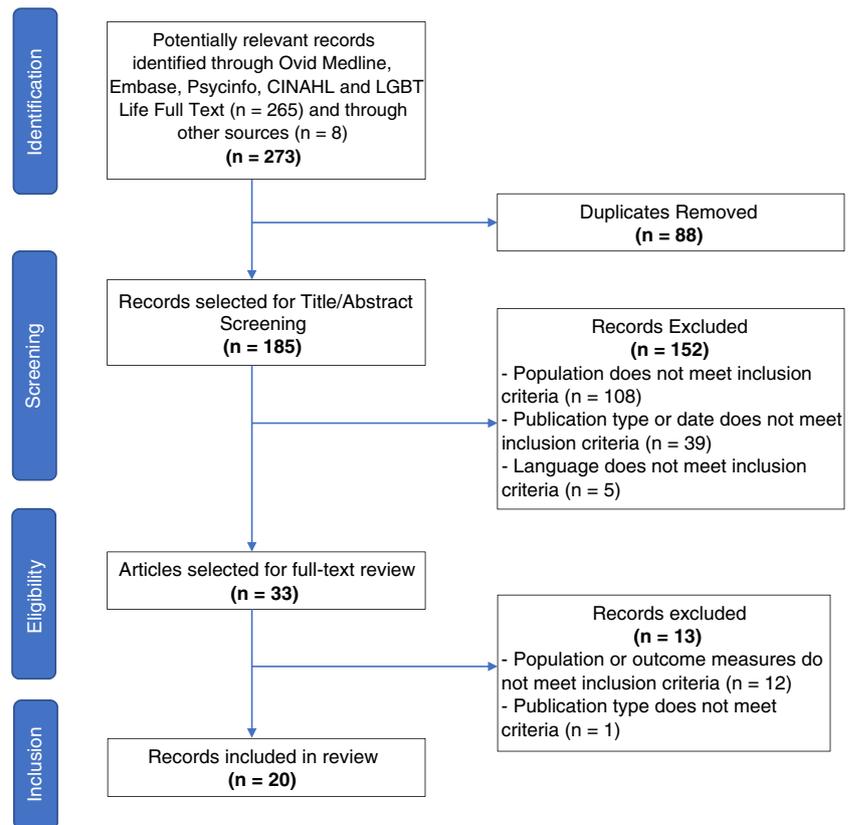
Screening

The initial search of databases and other sources yielded 273 records. Following removal of duplicates, 185 records were title and abstract screened, leaving 33 articles for full-text review. Twenty articles were identified as fully meeting criteria for inclusion in the review (see Fig. 1 for details). The articles were independently screened by two researchers; disagreement regarding eligibility was resolved through consultation with a third team member.

Data Extraction and Synthesis

Data extracted included the population, treatment setting, methodology, and key findings relevant to eating disorder diagnosis and/or evaluation of eating disorder symptoms (e.g., binge eating and compensatory eating behaviors). A narrative synthesis of the data was performed, employing thematic analysis of concepts, in accordance with recommendations from Popay and colleagues [16].

Fig. 1 Details of study screening and articles selected for review. Search was conducted in accordance with Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) method [15]



Research Team

The two researchers leading the search were a psychologist (JC) and bachelor's level research assistant (JS) working in a pediatric eating disorders program. Additional team members consisted of experts in trans youth health (BC), eating disorders (PYL and JG), and adolescent development (SM).

Results

Among the 20 publications selected for inclusion, there were ten cases studies/case series, six retrospective chart reviews, and four surveys. Papers were published in specialty journals relating to eating disorders ($n = 7$), pediatric/adolescent health ($n = 5$), sexual/gender health ($n = 3$), general psychiatry/psychology ($n = 4$), and other specialty mental health ($n = 1$) journals. Six countries were represented in the publications: USA ($n = 11$), Canada ($n = 4$), UK ($n = 2$), Australia ($n = 1$), Finland ($n = 1$), and Italy ($n = 1$) (see Table 1 for further detail). The 10 publications with case studies/case series [18, 19, 20, 22, 24, 30, 31, 32, 33, 35] represented 16 trans youth with eating disorders, including 8 trans males, 3 trans females,

and 5 individuals whose gender was non-binary (e.g., genderfluid, genderqueer).

Synthesis

Eating Disorder Diagnoses and Symptoms in Trans Youth

There was wide variation across studies in the percentage of trans youth with an eating disorder diagnosis, ranging from 2% to nearly 18% [7, 17, 21, 23, 25, 27, 28, 29]. The study with the largest sample size, which examined the prevalence of psychiatric diagnosis in a sample of 1333 trans and gender diverse youth between the ages of 3–17 years at three American sites, reported that among youth ages 10 to 17, 4.3% of transmasculine youth and 4.2% of transfeminine youth reported a lifetime eating disorder diagnosis [17]. Two papers documented no significant difference between trans males and trans females in the rate of eating disorder diagnoses [7, 28]; both studies were based on relatively small samples with less than 100 trans youth. The highest rates of eating disorder diagnoses among trans youth emerged from an American survey that collected data on self-reported diagnoses in

Table 1 Studies included in review

Author(s), year and country	Study population	Age	Study methodology
Becerra-Culqui et al., 2018 (USA) [17]	Transgender and/or gender nonconforming ($n = 1, 333$) and matched referent cisgender male ($n = 13, 151$) and female ($n = 13, 149$) children and youth	3–17 years	<ul style="list-style-type: none"> · Electronic medical record review · Includes prevalence of eating disorder diagnoses
Churcher-Clarke & Spiliadis, 2019 (UK) [18]	Genderfluid, assigned female at birth, with an eating disorder diagnosis	14 years	Case study
Cibich & Wade, 2019 (Australia) [19]	Trans male with an eating disorder diagnosis	16 years	Case study
Coururier, Pindiprolu, Findlay, & Johnson, 2015 (Canada) [20]	Trans female and trans male (both with an eating disorder diagnosis)	13 and 16 years	Case studies
Diemer, Grant, Munn-Chernoff, Patterson, & Duncan, 2015 (USA) [21•]	Trans ($n = 479$), cisgender sexual minority male ($n = 5, 977$), cisgender sexual minority female ($n = 9, 445$), cisgender unsure male ($n = 1, 662$), cisgender heterosexual males ($n = 91, 599$), cisgender unsure female ($n = 3, 395$), and cisgender heterosexual female ($n = 176, 467$) youth	Median age = 20 years	<ul style="list-style-type: none"> · Survey (American College Health Association - National College Health Assessment) · Includes self-report of eating disorder diagnosis (anorexia nervosa or bulimia nervosa) in the past 12 months, and vomiting or laxative use in past 30 days
Donaldson, Hall, Neukirch, Kasper, Simones, Gagnon, Reich, & Forcier, 2018 (USA) [22••]	1 trans female/genderfluid, 1 genderqueer (assigned female at birth), 3 trans male youth (all with an eating disorder diagnosis)	13–22 years	Case series
Duffy, Henkel, & Joiner, 2019 (USA) [23•]	Trans ($n = 678$), cisgender female ($n = 237, 844$), and cisgender male ($n = 127, 227$) youth	Median age = 21 years	<ul style="list-style-type: none"> · Survey (American College Health Association - National College Health Assessment) · Includes self-report of eating disorder diagnosis (anorexia nervosa or bulimia nervosa) in the past 12 months
Ewan, Middleman, & Feldman, 2014 (USA) [24]	Trans female youth with an eating disorder diagnosis	19 years	Case study
Feder, Isserlin, Seale, Hammond, & Norris, 2017 (Canada) [25•]	Trans female ($n = 37$) trans male ($n = 58$), and genderfluid, assigned female at birth ($n = 2$) youth	12–18 years	<ul style="list-style-type: none"> · Retrospective chart review for all adolescents assessed and treated in a gender diversity clinic · Includes proportion of trans youth who had an eating disorder diagnosis
Guss, Williams, Reisner, Austin, & Katz-Wise, 2016 (USA) [26]	Trans ($n = 67$), cisgender male ($n = 1, 117$) and cisgender female ($n = 1, 289$) youth	Mean age = 16 years	<ul style="list-style-type: none"> · Survey (Massachusetts Youth Health Survey - public high schools) · Includes self-report of vomiting and laxative use
Kaltiala-Heino, Sumia, Tyolajavri & Lindberg, 2015 (Finland) [27]	Trans youth ($n = 47$)	Mean age = 16 years	<ul style="list-style-type: none"> · Retrospective chart review of adolescents attending assessment at a gender identity service · Includes proportion of trans youth who had an eating disorder diagnosis
Khatchadourian, Amed & Metzger, 2014 (Canada) [7]	Trans male ($n = 45$), trans female ($n = 37$), and gender questioning, assigned male at birth ($n = 2$)	12–24 years	<ul style="list-style-type: none"> · Retrospective chart review of adolescents with gender dysphoria attending a gender clinic · Includes proportion of trans youth who had an eating disorder diagnosis
Nahata et al., 2017 (USA) [28]	Trans male ($n = 51$) and trans female ($n = 28$) youth	9–18 years	<ul style="list-style-type: none"> · Retrospective chart review of youth referred to gender program · Includes proportion of trans youth who had an eating disorder diagnosis
Peterson et al., 2017 (USA) [29]	Trans male ($n = 54$), trans female ($n = 31$), and nonbinary/gender fluid ($n = 15$) youth	12–22 years	<ul style="list-style-type: none"> · Retrospective chart review of youth who presented at a gender clinic · Includes proportion of trans youth who had an eating disorder diagnosis
Ristori, Fisher, Castellini, Sensi, Cipriani, Ricca, & Maggi, 2019 (Italy) [30•]	Trans female and trans male youth with an eating disorder diagnosis	14 and 16 years	Case studies

Table 1 (continued)

Author(s), year and country	Study population	Age	Study methodology
Sevlever & Meyer-Bahlburg, 2019 (USA) [31]	Transqueer/bigender youth with an eating disorder diagnosis	16 years	Case study
Strandjord, Ng, & Rome, 2015 (USA) [32•]	Trans male youth with an eating disorder diagnosis	16 years	Case study
Wagner & Stevens, 2017 (USA) [33]	Trans male youth with an eating disorder diagnosis	23 years	Case study
Watson, Veale, & Saewyc, 2017 (USA/New Zealand/Canada) Participants were recruited from Canada [34••]	Trans youth ($n = 923$, including trans girls/women, trans boys/men, and non-binary youth)	14–25 years	<ul style="list-style-type: none"> · Online survey (Canadian Trans Youth Health Survey) · Includes self-report of binge eating and use of laxatives or vomiting in the past 12 months
Wright, 2018 (UK) [35]	Non-binary youth, assigned female at birth, with gender dysphoria and anorexia nervosa diagnoses	16 years	Case study

college students, with 17.6% of trans individuals reporting a past-year eating disorder diagnosis, in comparison to 1.8% of cisgender female youth and 0.2% of cisgender male youth [23•].¹

Although there is variation in the literature with respect to prevalence of eating disorder diagnoses among trans youth, survey research consistently demonstrates that a relatively large proportion of trans youth engage in binge eating and compensatory eating behaviors. In a national online survey of Canadian trans youth between the ages of 14 to 25 years ($n = 923$), for youth between the ages of 14–18, 42% reported engaging in binge eating, 48% reported fasting, and 18% reported vomiting for weight control [34••]. While this study did not include a comparison group of cisgender youth, a recent survey of American high school students did document eating behaviors of a small sample of trans youth ($n = 67$) in comparison to cisgender peers [26]. In this study, trans youth had higher odds of engaging in some unhealthy weight management strategies (i.e., fasting, diet pills, laxative use) than cisgender male youth ($n = 1, 117$), but no significant differences were found in the use of unhealthy weight management strategies between trans youth and cisgender female youth ($n = 1, 289$) [26]. Similarly, a national survey of college students in the USA revealed eating disorder symptoms (i.e., vomiting, laxative use) were more common in trans youth ($n = 479$) in comparison to cisgender youth ($n = 288, 545$) [21•]. Finally, Watson and colleagues [34••] compared the prevalence of eating disorder symptoms across trans girls/

women, trans boys/men, and non-binary youth, and identified that non-binary youth ages 14 to 18 years were more likely than trans boys/men to report having engaged in vomiting for weight control, but found no differences among these three groups regarding other symptoms (i.e., binge eating, fasting, pills/speed, or laxative use).

Differential Diagnosis and Diagnostic Considerations

Engagement in Food Restriction and Compensatory Behaviors to Control Pubertal Development

Across 12 of the 16 cases documented in case studies and series reviewed, a recurring theme was use of food restriction and compensatory behaviors as a means to control pubertal development/delay developing secondary sex characteristics, or attain body characteristics of the congruent gender [18, 19, 20, 22••, 24, 30•, 31, 32•, 33, 35]. In seven of the cases, eating behaviors that are characteristic of eating disorders (e.g., severe food restriction, excessive exercise) were reported as a way of delaying pubertal development and/or secondary sex characteristics (e.g., breast development or pubertal masculinization) [18, 20, 22••, 30•, 33, 35]. For example, one trans youth viewed food restriction and excessive exercise as a solution that effectively supported gender goals of menstruation cessation and delay/interruption of secondary sex characteristic development [35]. Five reports referred to the use of restriction and/or compensatory eating behaviors (such as vomiting or laxative use) as a way to manage gender expression (e.g., attain a body shape or physical appearance more consistent with gender, decrease hair growth) [19, 20, 24, 31, 32•].

In a clinical case report, Couturier [20] drew attention to the need for differential diagnosis among eating disorders, gender dysphoria, and body dysmorphic disorder to distinguish the reasons underlying eating behaviors and generate appropriate treatment plans. A chart review of youth seen at a Canadian

¹ The study by Duffy et al. [23•] did not report the age range of participants and may have included individuals over the age of 25. However, given that the median age of participants fit the inclusion criteria, the study was included in the review. The study reported by Duffy and colleagues also had an overlapping sample with Diemer and colleagues [21•], as both studies analyzed data from the National College Health Assessment. Duffy et al. [23•] reported on a larger sample of trans youth ($n = 678$) than the report by Diemer and colleagues [21•], which included 479 trans youth.

gender clinic documented that youth almost ubiquitously reported body dissatisfaction related to the lack of alignment between sex and gender identity, providing further support for the importance of assessing body dissatisfaction related to gender dysphoria (as opposed to weight/shape-related concerns) [25•]. In this study, only five youth received an eating disorder diagnosis, while an additional ten youth were described as having eating disorder oriented thoughts/preoccupations and eating disorder-specific symptoms without an eating disorder diagnosis [25•].

Identification of Gender Dysphoria and Impact of Gender-Affirming Treatment on Eating Disorder Symptoms

Although the timing of identification of gender dysphoria and the onset of gender-affirming treatment are not clearly identified in all of the case reports, eight of the 16 cases indicated that gender-related concerns were not discussed or disclosed until after eating disorder treatment had commenced [20, 22•, 30•, 31, 32•]. Strandjord and colleagues [32•] highlighted that for one adolescent, the presentation of symptoms of food restriction in conjunction with concerns about weight gain led to a diagnosis of anorexia nervosa, but lack of screening for gender concerns contributed to a delay in identification of gender identity as a relevant issue.

Among youth who accessed gender-affirming medical interventions (e.g., pubertal suppression, hormone therapy) body satisfaction and psychological well-being improved and disordered eating symptoms decreased or resolved for some youth [22•, 24, 30•]. Many of the cases presented in the literature contained limited information about longer-term outcomes related to eating disorder symptoms, as some youth did not continue with treatment programs or aged out of the pediatric system [20, 24]; however, Cibich and Wade [19] reported maintenance of eating disorder symptom reduction in a trans male youth with bulimia nervosa 7 months following the completion of ten sessions of cognitive-behavioral therapy.

Self-injury and Suicidality

Self-injurious behaviors, suicidal ideation, and/or suicide attempts were common across the majority of cases reported. In 13 cases, current or past suicidality and/or self-harm were reported [18, 19, 20, 22•, 30•, 31, 33, 35], including suicide attempts [18, 19, 22•, 33] and one completed suicide [22•]. Trans youth populations have been identified as at risk for life-threatening behaviors [29]; however, trans youth with eating disorders appear to be a particularly high-risk group. Researchers who conducted a national survey of American college students found that trans youth with eating disorders were more than 20 times as likely to have attempted suicide in the past year than cisgender female youth with eating

disorders or trans individuals who did not report eating disorder diagnoses [23•]. Furthermore, approximately 75% of trans youth with eating disorders endorsed a suicide attempt, suicidal ideation, and/or engaging in non-suicidal self-injury within the last year, while trans youth without eating disorders were significantly less likely to report suicidality or self-injurious behaviors [23•].

Analysis

Emerging evidence suggests that trans youth are more likely than cisgender youth to demonstrate behaviors consistent with eating disorder symptoms, and some studies suggest trans youth are also more likely to have an eating disorder diagnosis [21•, 23•]. However, the variability of eating disorder prevalence among trans youth reported in the literature makes it difficult to interpret these findings. Data from retrospective chart reviews suggest 2–5% of trans youth have received an eating disorder diagnosis [7, 17, 25•, 27, 29], though one study reported a higher rate of 12.7% [28]. In contrast, 15.8–17.6% of trans youth have self-reported eating disorder diagnoses in survey research [21•, 23•]. One of the challenges reported by multiple authors in interpreting data on eating disorder diagnoses among trans and cisgender youth is that youth who seek gender-affirming medical care typically undergo a mental health assessment, making it more likely that they have had screening for eating disorders and ongoing monitoring of mental health than cisgender youth [17, 21•]. An additional challenge in interpreting these data are whether eating disorder diagnoses are documented by health professionals based on established diagnostic classification systems [17, 25•], including the *International Classification of Diseases* [36] and the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) [37], or are self-reported [21•, 23•].

One of the primary themes that emerged through case reports was that a majority of these youth reported engaging in food restriction and/or compensatory behaviors aimed at controlling pubertal development or attaining physical characteristics consistent with their gender. Some youth identified these eating behaviors as effective in enabling them to meet their gender goals in the absence of access to gender-affirming medical interventions and did not perceive that they had an eating disorder [30•]. The concerns of conflating eating disorder symptoms with eating behaviors that are secondary to gender dysphoria is highlighted by Giordano [38], who states that eating disorder-specific treatment is likely to be ineffective if gender-affirming care is not provided. Consistent with this assertion, Ristori and colleagues documented that traditional eating disorder treatment was not effective, and that healthy eating and exercise patterns were only restored after gender-affirming treatment was provided, for two trans youth who were initially diagnosed with anorexia nervosa [30•].

Feder and colleagues [25•] documented that some youth concurrently met criteria for both an eating disorder and gender dysphoria, suggesting that eating disorder-specific treatment is warranted for some trans youth with eating disorder symptoms. For individuals with severe eating disorder symptoms, or symptoms of medical instability, specialized eating disorder treatment may be needed to mitigate risk of long-term and potentially fatal medical consequences [39, 40]. This may include hospitalization for medical stabilization, or (for underweight youth) treatment with a focus on weight restoration. A paucity of evidence about longer-term outcomes limits the conclusions that can be drawn regarding the effects of concurrent, separate, or no access to eating disorder treatment or gender-affirming care on eating disorder symptomology and other aspects of well-being. However, Donaldson et al. [22•] have documented risks of eating disorder symptom exacerbation, increased self-harm, and suicide associated with lack of parental support for gender-affirming medical care. Furthermore, recent literature suggests that gender-affirming care can reduce eating disorder symptoms in some individuals [30•], and no evidence has been identified that gender-affirming care worsens eating disorder symptoms.

Challenges in differentiating eating behaviors linked to gender dysphoria and clinical eating disorders are evident in diagnostic criteria. One of the diagnostic criteria in the DSM-5 [37] for gender dysphoria pertains to a desire to be “rid of one’s primary and/or secondary sex characteristics...or in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics” (page 452). Similarly, diagnosis of eating disorders (e.g., anorexia nervosa or bulimia nervosa) includes a criterion for body image dissatisfaction that is related to shape or weight. As documented in case reports, trans youth may engage in restrictive and/or compensatory eating behaviors to support gender expression (e.g., to prevent or disrupt the development of unwanted secondary sex characteristics), but these may be misinterpreted as behaviors solely indicative of an eating disorder. It is also possible that trans youth may over-report body dissatisfaction in an attempt to conform to perceived diagnostic requirements to access gender-affirming medical care [41]. Additionally, Murray, Griffiths, and Mond [42] have raised concerns about the current classification scheme for eating disorders in the DSM-5 [37], which are skewed towards stereotypical female presentations, highlighting the lack of diagnostic criteria related to certain shape/weight concerns, such as muscularity, that may be relevant across the gender spectrum.

Care provided in eating disorder programs may not reflect current practices in gender-affirming care. It is understandable that eating disorders clinicians may have little training in gender-affirming care, and likewise, gender health clinicians may not be familiar with current best practices in eating disorders treatment. Therefore, as Donaldson et al. [22•] highlight, there is a need for interdisciplinary collaboration across

eating disorder and gender-affirming treatment programs to ensure trans youth are supported through accurate assessment and access to the care that will best meet their needs.

Limitations

The search strategy was developed to capture articles relevant to the research question; however, an additional eight articles were identified for screening from additional sources that were not included in the initial database search. These articles did not contain terms relevant to eating disorders in the subject headings and/or keywords. As a result, articles that included secondary measurement of eating disorder diagnoses or related symptoms may have been missed. Furthermore, search terms were developed to focus on eating behaviors that were specific to eating disorder diagnoses, as opposed to dieting or weight management; accordingly, the selection of terms may have led to the exclusion of some potentially relevant papers.

Research Gaps

One of the primary gaps identified was the dearth of research that administered validated measures eating disorder symptoms to trans youth, with only one case report [19] presenting data from a validated eating disorder questionnaire. As Feder and colleagues [25•] highlight, the lack of psychometrically validated tools to assess eating disorder cognitions and behaviors in studies with trans youth is a major limitation for research in this area. Given that most of the standard measures in eating disorders have been validated with cisgender females [1], measures may need to be modified or developed to address the unique needs of trans youth.

An additional area for future research is inclusion of stratification of analysis based on gender (e.g., trans male, trans female, non-binary) and sex assigned at birth. Emerging research suggests that non-binary youth experience greater mental health concerns than do binary trans youth, including higher levels of depression and anxiety [43]. Further research is needed to clarify the risk for eating-related concerns in non-binary youth. Another gap in the literature is consideration of family and social support for gender affirmation/transition and access to needed gender-affirming medical care in relationship to the trajectory of eating disorder development and resolution. Lastly, prepubertal children may present with differential risk factors for eating-related concerns than adolescents and older trans youth, making developmental considerations another area for future research.

Implications for Clinical Care

Despite the increasing number of referrals of trans children and youth (e.g., 6), there is a lack of professional training for health professionals with respect to the needs of trans youth

[44]. Given the risks of delayed identification of gender-related concerns among individuals with eating disorders, which include the potential for prolonging psychological distress and limiting the progress of eating disorder treatment, early assessment of gender health needs is recommended.

Routine integration of gender health assessment into eating disorder assessments, as well as screening for symptoms of disordered eating in trans youth, have been recommended [9, 13]. Clinicians can also work to ensure that they are welcoming youth and families to gender-inclusive environments, for example, through having gender neutral bathrooms and ensuring gender diversity is present in materials offered to youth and their families [13]. Screening for gender-related concerns in eating disorder settings can include open-ended questions about gender identity and opportunities for youth to confidentially self-identify gender and pronouns on intake forms [32]. Some youth in case reports shared gender-related concerns after eating disorder treatment began; therefore, ongoing assessment throughout treatment, and exploration of the motivations for food restriction and/or compensatory eating behaviors, are also recommended. Finally, clinical care needs to include careful risk assessment and safety planning, as the included evidence suggests that trans youth with eating disorders are at particularly high risk for suicide attempt and self-injury [23].

Conclusions

It has been documented that trans youth have higher rates of eating disorder diagnoses and related symptoms than cisgender youth, and that trans youth who report eating disorders are more likely than cisgender youth to experience suicidality and self-harm. However, differences in study methodologies and the lack of eating disorder diagnostic measures that have been validated with this population complicate interpretation of data. Among trans youth, food restriction and compensatory eating behaviors may function as a means of coping with gender-related distress, employed to prevent or interrupt pubertal changes in the absence of access to gender-affirming medical interventions. Assessment practices that include screening for gender concerns and eating behaviors in both eating disorder treatment programs and gender-affirming treatment settings may improve the quality of care and health outcomes of trans youth.

Access to gender-affirming care was highlighted as essential to the reduction or resolution of eating disorder symptoms for some trans youth, and barriers to this care were associated with exacerbation of eating disorder symptomology, psychological distress, and suicidality. Given emerging evidence suggesting that severe food restriction and compensatory eating behaviors may be driven by gender dysphoria in some trans youth, it is critical to develop assessment practices and tools to

facilitate accurate diagnosis of eating disorders, identification of gender-related concerns, and appropriate treatment plans. Research is needed to validate eating disorder measures for use with trans youth and to evaluate outcomes related to eating disorder treatment and gender-affirming medical interventions. Further areas of research also include the evaluation of a collaborative care approach for trans youth who present with eating disorder symptoms, and individuals with eating disorders who present with gender-related concerns. Collaboration across eating disorder treatment and gender-affirming care settings may serve to enhance the quality of care and the health outcomes of trans youth.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that there are no conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

References

Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

1. Murray SB, Nagata JM, Griffiths S, Calzo JP, Brown TA, Mitchison D, et al. The enigma of male eating disorders: a critical review and synthesis. *Clin Psychol Rev.* 2017;57:1. <https://doi.org/10.1016/j.cpr.2017.08.001>.
2. Lee JY, Perl L, Rosenthal SM. Care of gender nonconforming/transgender youth. In: Radovick S, Misra M, editors. *Pediatr Endocrinol.* Springer, Cham. Doi: https://doi.org/10.1007/978-3-319-73782-9_36, 2018.
3. Surgenor LJ, Fear JL. Eating disorder in a transgendered patient: a case report. *Int J Eat Disord.* 1998;24:449–52. [https://doi.org/10.1002/\(SICI\)1098-108X\(199812\)24:4<449::AID-EAT14>3.0.CO;2-W](https://doi.org/10.1002/(SICI)1098-108X(199812)24:4<449::AID-EAT14>3.0.CO;2-W).
4. Hepp U, Milos G. Gender identity disorder and eating disorders. *Int J Eat Disord.* 2002;32:473–8. <https://doi.org/10.1002/eat.10090>.
5. Walters E, Whitehead L. Anorexia nervosa in a young boy with gender identity disorder of childhood: a case report. *Clin Child Psychol Psychiatr.* 1997;2:563–467. <https://doi.org/10.1177/1359104597023011>.
6. Spack NP, Edwards-Leeper L, Feldman HA, Leibowitz S, Mandel F, Diamond DA, et al. Child and adolescents with gender identity disorder referred to a pediatric medical center. *Pediatr.* 2012;3:418–25. <https://doi.org/10.1542/peds.2011-0907>.

7. Khatchadourian K, Amed S, Metzger DL. Clinical management of youth with gender dysphoria in Vancouver. *J Pediatr*. 2014;164:906–11. <https://doi.org/10.1016/j.jpeds.2013.10.068>.
8. Jones BA, Haycraft E, Murjan S, Arcelus J. Body dissatisfaction and disordered eating in trans people: a systematic review of the literature. *Int Rev Psychiatr*. 2016;28:81–94. <https://doi.org/10.3109/09540261.2015.1089217>. **A review of the link between gender dysphoria, disordered eating and body dissatisfaction.**
9. McClain Z, Peebles R. Body image and eating disorders among lesbian, gay, bisexual, and transgender youth. *Pediatr Clin N Am*. 2016;63:1079–90. <https://doi.org/10.1016/j.pcl.2016.07.008>.
10. Holt V, Skagerberg E, Dunsford M. Young people with features of gender dysphoria: demographics and associated difficulties. *Clin Child Psychol Psychiatr*. 2016;21:108–18. <https://doi.org/10.1177/1359104514558431>.
11. McCann E, Keogh B, Doyle L, Coyne I. The experiences of youth who identify as trans in relation to health and social care needs: a scoping review. *Youth Soc*. 2017;51:840–64. <https://doi.org/10.1177/0044118X17719345>.
12. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol*. 2005;8:19–32. <https://doi.org/10.1080/1364557032000119616>.
13. Goldhammer HN, Maston ED, Keuroghlian AS. Addressing eating disorders and body dissatisfaction in sexual and gender minority youth. *Am J Prev Med*. 2019;56:318–22. <https://doi.org/10.1016/j.amepre.2018.09.011>.
14. Connolly MD, Zervos MJ, Barone CJ II, Johnson CC, Joseph CL. The mental health of transgender youth: advances in understanding. *J Adolesc Health*. 2016;59(5):489–95. <https://doi.org/10.1016/j.jadohealth.2016.06.012>.
15. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med*. 2009;151(4):264–9. <https://doi.org/10.7326/0003-4819-151-4-200908180-00135>.
16. Popay J, Roberts H, Sowden A, Petticrew M, Arai L, Rodgers M, et al. Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC methods programme. Version. 2006;1:b92. <https://doi.org/10.13140/2.1.1018.4643>.
17. Becerra-Culqui TA, Liu Y, Nash R, Cromwell L, Flanders WD, Getahun D, et al. Mental health of transgender and gender nonconforming youth compared with their peers. *Pediatr*. 2018;141(5):e20173845. <https://doi.org/10.1542/peds.2017-3845>.
18. Churcher Clarke A, Spiliadis A. 'Taking the lid off the box': the value of extended clinical assessment for adolescents presenting with gender identity difficulties. *Clin Child Psychol Psychiatr*. 2019;24:338–52. <https://doi.org/10.1177/1359104518825288>.
19. Cibich M, Wade TD. Treating bulimia nervosa in the context of gender dysphoria using 10-session cognitive behavior therapy. *Int J Eat Disord*. 2019;52:602–6. <https://doi.org/10.1002/eat.23068>.
20. Couturier J, Pindiprolu B, Findlay S, Johnson N. Anorexia nervosa and gender dysphoria in two adolescents. *Int J Eat Disord*. 2015;48:151–5. <https://doi.org/10.1002/eat.22368>.
21. Diemer EW, Grant JD, Munn-Chernoff A, Patterson DA, Duncan AE. Gender identity, sexual orientation, and eating-related pathology in a national sample of college students. *J Adolesc Health*. 2015;57:144–9. <https://doi.org/10.1016/j.jadohealth.2015.03.003>. **A survey of self-reported eating disorder diagnosis and use of compensatory eating behaviors in a large sample of trans and cisgender youth.**
22. Donaldson AA, Hall A, Neukirch J, Kasper V, Simones S, Gagnon S, et al. Multidisciplinary care considerations for gender nonconforming adolescents with eating disorders: a case series. *Int J Eat Disord*. 2018;51:4675–479. <https://doi.org/10.1002/eat.22868>. **Case series highlighting the importance of collaborative treatment approaches among gender and eating disorder specialists.**
23. Duffy ME, Henkel KE, Joiner TE. Prevalence of self-injurious thoughts and behaviors in transgender individuals with eating disorders: a national study. *J Adolesc Health*. 2019;64(4):461–6. <https://doi.org/10.1016/j.jadohealth.2018.07.016>. **Study demonstrating that trans youth with eating disorders are at particularly high risk for self-injury and suicidal thoughts/behaviors.**
24. Ewan L, Middleman A, Feldmann J. Treatment of anorexia nervosa in the context of transsexuality: a case report. *Int J Eat Disord*. 2014;47:112–5. <https://doi.org/10.1002/eat.22209>.
25. Feder S, Isserlin L, Seale E, Hammond N, Norris M. Exploring the association between eating disorders and gender dysphoria in youth. *Eat Disord*. 2017;25:310–7. <https://doi.org/10.1080/10640266.2017.1297112>. **A large retrospective chart review that assessed for eating disorder symptoms and diagnoses in trans youth attending a gender diversity clinic.**
26. Guss C, Williams D, Reisner S, Austin B, Katz-Wise S. Disordered weight management behaviors, nonprescription steroid use, and weight perception in transgender youth. *J Adolesc Health*. 2016;60:17–22. <https://doi.org/10.1016/j.jadohealth.2016.08.027>.
27. Kaltiala-Heino R, Sumia M, Työläjärvi M, Lindberg N. Two years of gender identity service for minors: overrepresentation of natal girls with severe problems in adolescent development. *Child Adolesc Psychiatry Ment Health*. 2015;9(1):9. <https://doi.org/10.1186/s13034-015-0042-y>.
28. Nahata L, Quinn GP, Caltabellotta NM, Tishelman AC. Mental health concerns and insurance denials among transgender adolescents. *LGBT health*. 2017;4(3):188–93. <https://doi.org/10.1089/lgbt.2016.0151>.
29. Peterson CM, Matthews A, Copps-Smith E, Conard LA. Suicidality, self-harm, and body dissatisfaction in transgender adolescents and emerging adults with gender dysphoria. *Suicide Life Threat Behav*. 2017;47(4):475–82. <https://doi.org/10.1111/sltb.12289>.
30. Ristori J, Fisher A, Castellini G, Sensi C, Cipriani A, Ricca V, et al. Gender dysphoria and anorexia nervosa symptoms in two adolescents. *Arch Sex Behav*. 2019;27:1–7. <https://doi.org/10.1007/s10508-019-1396-7>. **Case studies highlighting a reduction in food restriction after gender-affirming medical treatment was provided for two trans youth.**
31. Sevelever M, Meyer-Bahlburg HF. Late-onset transgender identity development of adolescents in psychotherapy for mood and anxiety problems: approach to assessment and treatment. *Arch Sex Behav*. 2019. <https://doi.org/10.1007/s10508-018-1362-9>.
32. Strandjord S, Ng H, Rome E. Effects of treating gender dysphoria and anorexia nervosa in a transgender adolescent: lessons learned. *Int J Eat Disord*. 2015;48:194–945. <https://doi.org/10.1002/eat.22438>. **A case study highlighting the importance of screening for gender concerns in youth with eating disorders.**
33. Wagner R, Stevens JR. Clinical barriers to effective treatment of eating disorders and co-occurring psychiatric disorders in transgendered individuals. *J Psychiatr Pract*. 2017;23:284–9. <https://doi.org/10.1097/PRA.0000000000000248>.
34. Watson R, Veale J, Saewyc E. Disordered eating behaviors among trans youth: probability profiles from risk and protective factors. *Int J Eat Disord*. 2017;50:515–22. <https://doi.org/10.1002/eat.22576>. **Examination of predictors of disordered eating behavior in a large sample of transgender youth recruited from a national online survey.**
35. Wright H. 'Emotional turbulence': the development of symbolic thinking in the psychotherapeutic treatment of an adolescent girl. *J Child Psychother*. 2018;44:55–72. <https://doi.org/10.1080/0075417X.2018.1440617>.
36. World Health Organization. The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines. Geneva: World Health Organization; 1992.

37. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5). American Psychiatric Pub; 2013.
38. Giordano S. Eating yourself away: reflections on the 'comorbidity' of eating disorders and gender dysphoria. *Clin Ethics*. 2017;12:45–53. <https://doi.org/10.1177/1477750916661977>.
39. Monge MC, Loh M. Medical complications of eating disorders in pediatric patients. *Pediatr Ann*. 2018;47(6):e238–43. <https://doi.org/10.3928/19382359-20180518-01>.
40. Golden NH, Katzman DK, Sawyer SM, Ornstein R. Position paper of the society for adolescent health and medicine: medical management of restrictive eating disorders in adolescents and young adults. *J Adolesc Health*. 2015;56(1):121–5. <https://doi.org/10.1016/j.jadohealth.2014.10.259>.
41. Ashley F Gatekeeping hormone replacement therapy for transgender patients is dehumanising. *J Med Ethics*. 2019:medethics-2018. Doi:<https://doi.org/10.1136/medethics-2018-105293>.
42. Murray SB, Griffiths S, Mond JM. Evolving eating disorder psychopathology: conceptualising muscularity-oriented disordered eating. *Br J Psychiatry*. 2016;208(5):414–5. <https://doi.org/10.1192/bjp.bp.115.168427>.
43. Thorne N, Witcomb GL, Nieder T, Nixon E, Yip A, Arcelus J. A comparison of mental health symptomatology and levels of social support in young treatment seeking transgender individuals who identify as binary and non-binary. *Int J Transgenderism*. 2018;20:241–50. <https://doi.org/10.1080/15532739.2018.1452660>.
44. Keo-Meier CE, Ehrensaft DE. Introduction to the gender affirmative model. American Psychological Association; 2018.

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