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SHORT REPORT

A Comparison of Demographic and Psychosocial Characteristics Between Transgender Youth Enrolling Versus Not Enrolling in a Multisite Study

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Abstract

Purpose: To characterize demographics, psychosocial functioning, and gender-related experiences in transgender youth enrolling versus declining participation in a multisite research study.

Methods: Clinical data were abstracted from patient charts at two study sites. Continuous variables were compared using *t*-tests, and categorical variables were compared using χ^2 tests based on study enrollment status.

Results: Few significant differences were observed between enrolled and nonenrolled youth. None of these differences (i.e., designated sex at birth/gender identity; parent-reported separation anxiety; and youth-reported attention deficit/hyperactivity disorder) was replicated across sites.

Conclusion: Trans Youth Care findings are likely generalizable to transgender youth initiating hormone treatment at pediatric academic centers.

Keywords: gender-affirming care; gender-affirming hormones; gender dysphoria; gender expansive adolescents; research participation

Introduction

Potential nonparticipation has been identified as a barrier to advancing transgender health research;[1] however, no studies to date have specifically examined whether transgender youth participating in research differ from those who choose not to participate. Recent estimates suggest that up to 2.7% of high-school students identify as transgender, nonbinary, or gender questioning,[2] accounting for the increasing numbers of adolescents presenting for transition-related medical care.[3] Research is needed to evaluate the benefits and risks of gender-affirming medical interventions in transgender youth.[1,4] Current guidelines[5,6] for hormone treatment (i.e., testosterone and estrogen) in adolescence are informed largely by studies in transgender adults showing that hormone treatment is associated with reduced anxiety, perceived and social distress, and improved quality of life and self-esteem.[7] Fewer studies have specifically examined psychosocial outcomes for hormone treatment among transgender adolescents.[8–10]

In 2015, the National Institutes of Health funded four pediatric academic medical centers in the United States to conduct a prospective observational study examining physiological and psychological outcomes of gender-affirming medical interventions in two cohorts of youth with gender dysphoria—those initiating pubertal suppression and those initiating hormone treatment.[11] These centers, each specializing in multidisciplinary gender health care, form the Trans Youth Care (TYC) network and include Children's Hospital Los Angeles

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(CHLA), Ann & Robert H. Lurie Children's Hospital of Chicago (Lurie Children's), Boston Children's Hospital (BCH), and Benioff Children's Hospital.

Findings from TYC have the potential to significantly advance evidence-based practice for transgender youth. Thus, it is critical to determine the extent to which youth enrolling in TYC are similar to TYC-eligible youth who decline study enrollment. Baseline differences in key demographic characteristics, aspects of psychosocial functioning, or gender-specific experiences based on study enrollment status would call into question whether TYC findings generalize to most adolescents seeking medical care from pediatric academic settings regardless of sociodemographic characteristics or patterns of psychological functioning and gender-related distress. To assess the generalizability of TYC findings, we compared baseline demographic characteristics, psychosocial functioning, and gender-related experiences in TYC-eligible youth enrolling in TYC versus those who declined study enrollment.

Methods

Procedures

The present study sites included Lurie Children's[12] and BCH[13] since they are TYC sites that, as per their clinical protocols and independent of the TYC protocol, administer a battery of youth- and parent-reported psychosocial measures assessing psychological functioning and gender-related experiences (i.e., gender dysphoria, body image, and gender congruence) at a patient's point of entry into clinical services. In the absence of similar clinically-derived data, CHLA and Benioff Children's Hospital were not included in the present study. In the present study, we identified all patients that screened eligible and were approached for TYC recruitment into the hormone treatment cohort at Lurie Children's and BCH from July 2016 to September 2018. We, then, extracted from medical charts demographic information and scores from psychosocial screening measures. Eligibility for TYC included the following: (1) presence of gender dysphoria as determined by a clinician, (2) deemed ready to initiate testosterone/estrogen by the treatment team, (3) ages 8–20 years, (4) English proficiency, and (5) receiving services at one of the study sites. TYC methods are comprehensively detailed in a protocol published elsewhere.[11] The current study received Institutional Review Board approval from Lurie Children's (IRB 2017-744) and BCH (IRB-P00001434) as archival chart review studies, waiving the requirement for obtaining informed consent.

Measures

Psychological functioning.

The Adolescent Symptom Inventory (ASI)[14] and Youth Inventory (YI),[15] administered at Lurie Children's, are parent- and youth-reported screening measures of Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) criteria for emotional and behavioral disorders among youth aged 12–18 years. Respondents reported the frequency of each symptom occurrence on a 4-point scale (0 = never, 3 = very often). We summed responses to generate symptom severity scores for the following diagnoses: attention deficit/hyperactivity disorder (ADHD, Inattentive, Hyperactive/Impulsive, and Combined); Conduct Disorder; Oppositional Defiant Disorder; Generalized Anxiety Disorder; Social Anxiety Disorder; Separation Anxiety Disorder; Major Depressive Disorder; and Dysthymia. Higher scores reflect more problem behavior. Of note, although the ASI and YI scoring guides allow for conversion of raw scores to standardized scores based on sex-referenced norms, we did not take this approach given the lack of professional consensus regarding the use of sex-normed data with transgender populations and recommendations to use alternative scoring methods when available.[16]

The Child Behavior Checklist (CBCL)[17] and Youth Self-Report (YSR),[18] administered at BCH, are empirically-based parent- and youth-reported measures of emotional and behavioral functioning in youth ages 6–18 and 12–18 years, respectively. Respondents reported the frequency of each behavior on a 3-point scale (0 = not true, 2 = very true or often true). Recent research suggests that scoring the CBCL using norms based on designated sex at birth versus gender does not significantly impact score interpretation.[19] Gender-based norms are limited to male or female, resulting in an inability to score forms completed by nonbinary youth. Therefore, we converted raw scores into *T* scores with respect to youths' designated sex at birth. Higher scores indicate more problem behaviors. We used Total Problems, Internalizing Problems, and Externalizing Problems scales as broadband measures of functioning and Anxious/Depressed, Withdrawn, Somatic Complaints, Social Problems, Attention Programs, and Aggressive Behavior syndrome scales.

Gender-related experiences.

Both Lurie Children's and BCH administered the Utrecht Gender Dysphoria Scale (UGDS)[20] and the Body Image Scale (BIS),[21] which have distinct but analogous versions based on designated sex at birth. The UGDS[20] is a 12-item self-report measure of gender dysphoria severity. Each item

is rated on a 5-point scale from "disagree completely" to "agree completely" (e.g., "Every time someone treats me like a boy/girl I feel hurt"). Responses are summed with higher scores reflecting greater gender dysphoria severity. The BIS[21] is a 30-item self-report measure of satisfaction with various body parts using a 5-point scale from "very satisfied" to "very dissatisfied." We summed responses with higher scores reflecting more body dissatisfaction.

In addition to these measures, Lurie Children's also administered the Transgender Congruence Scale (TCS),[22] a 12-item self-report questionnaire assessing a respondent's authenticity and comfort with their gender identity and external appearance. Each item is rated on a 5-point Likert scale from "strongly disagree" to "strongly agree" (e.g., "My physical body represents my gender identity"). We calculated mean scores to reflect two subscales (Appearance Congruence and Identity Acceptance) and an overall Total TCS score, with higher scores reflecting greater congruence and/or acceptance.

Statistical analysis

We characterized the Lurie Children's and BCH samples with descriptive statistics. We compared continuous variables and categorical variables based on study enrollment status using *t*-tests and χ^2 tests, respectively. All statistical tests were two sided with a significance threshold set at $p \leq 0.05$. To avoid introducing bias in the direction of no group differences, we did not use a correction for multiple comparisons.

Results

Lurie Children's sample included 133 youth, aged 12.9–20.7 years [*M(SD)* = 16.4 (1.7)]. The majority was white (78%), designated female at birth (64%), and identified as male/transmasculine (63%). BCH's sample included 66 youth, aged 11.7–20.0 years [*M(SD)* = 15.9 (1.6)]. The majority was also white (70%), designated female at birth (73%), and identified as male/transmasculine (67%). Table 1 depicts youth demographics by TYC enrollment status for both sites. At Lurie Children's, youth enrolling in TYC did not differ significantly from TYC-eligible youth who declined study enrollment on age, designated sex at birth, gender identity, or race/ethnicity. At BCH, youth designated male at birth were less likely to enroll in TYC than those designated female at birth, $t(1) = 8.04$, $p = 0.005$, and enrolled youth were more likely to identify as male/transmasculine than nonenrolled youth, $\chi^2(3) = 11.4$, $p = 0.002$. There were no differences in age or race/ethnicity based on enrollment status.

Tables 2 and 3 show comparisons of psychological functioning, gender dysphoria severity, body image, and gender congruence in youth by enrollment status at Lurie Children's and BCH, respectively. There were no significant differences in gender dysphoria, body image, appearance congruence, or gender identity acceptance based on enrollment status at Lurie Children's. There were, however, group differences in some aspects of psychological functioning at Lurie Children's. Specifically, TYC-enrolled youth had fewer parent-reported symptoms of separation anxiety disorder, $t(105) = -2.94$, $p = 0.004$, and more self-reported symptoms of ADHD-Hyperactive Impulsive, $t(109) = 2.40$, $p = 0.02$, and ADHD-Combined symptoms, $t(106) = 2.26$, $p = 0.03$. There were no significant differences in psychological functioning, gender dysphoria, or body image based on enrollment status at BCH.

Discussion

There were no significant differences in gender dysphoria severity, body image, appearance congruence, and identity acceptance between transgender youth enrolling in TYC versus youth declining study enrollment at Lurie Children's and BCH. These are important findings in light of TYC's key aim to examine the impact of hormone treatment on gender-related distress over time; significant baseline differences in key outcomes based on enrollment status would cause concern about the generalizability of TYC study findings.

The few differences between enrolled and nonenrolled youth based on demographic characteristics and psychological functioning were site specific and informant specific. The larger proportion of male/transmasculine-identified youth and youth designed female at birth enrolling in TYC at BCH was not replicated at Lurie Children's. Furthermore, findings that youth with lower parent-reported separation anxiety and higher self-reported ADHD were more likely to enroll in TYC were not replicated at BCH or in analyses of self-reported separation anxiety and parent-reported ADHD at Lurie Children's. Thus, there is no evidence that demographic characteristics, psychological functioning, or gender-related distress are systematically associated with likelihood to participate in research among transgender youth. Potential nonparticipation in research by subgroups of transgender individuals has been cited as a possible barrier to generalizability of research findings.[1] We found few baseline differences based on enrollment status. These few differences were not consistent across reporter or across sites. Therefore, our findings support generalizability of TYC results to the population of

Table 1. Demographic Characteristics Based on Trans Youth Care Enrollment Status

	Enrolled	Not Enrolled	*t* or χ^2 (df)	*p*	Effect Size[b]
Lurie Children's (*N* = 133)					
Total n (%)	93 (70%)	40 (30%)	—	—	—
Age *M (SD)*	16.28 (1.68)	16.68 (1.63)	−1.27 (131)	0.20	0.24
Designated Sex at Birth					
Male	31 (33%)	17 (43%)	1.02 (1)	0.31	0.09
Female	62 (67%)	23 (56%)			
Gender Identity					
Transmasculine/Male	61 (66%)	22 (55%)	4.48 (2)	0.11	0.18
Transfeminine/Female	31 (33%)	15 (37.5)			
Nonbinary	1 (1%)	3 (7.5%)			
Race/Ethnicity (*n* = 125)					
White	69 (78%)	28 (78%)	0.001 (1)[a]	0.98	0.003
Black/African American	5 (6%)	2 (6%)			
Latinx	6 (7%)	3 (8%)			
Asian	2 (2%)	1 (3%)			
Multiracial	4 (4%)	2 (6%)			
Other	3 (3%)	0 (0%)			
Boston Children's Hospital (*N* = 66)					
Total *n* (%)	37 (56%)	29 (44%)	—	—	—
Age *M (SD)*	15.9 (1.6)	15.9 (1.6)	−0.05 (60)	0.96	0
Designated Sex at Birth					
Male	5 (14%)	14 (45%)	8.04 (1)	**0.005**	0.35
Female	32 (85%)	16 (55%)			
Gender Identity					
Transmasculine/Male	30 (86%)	14 (52%)	11.4 (3)	**0.002**	0.43
Transfeminine/Female	3 (9%)	12 (44%)			
Nonbinary	1 (3%)	1 (4%)			
Other	1 (3%)	0 (0%)			
Race/Ethnicity					
White	27 (73.0%)	19 (65.5%)	0.20 (1)[a]	0.66	0.06
Black/African American	2 (5.4%)	1 (3.5%)			
Latinx	1 (2.7%)	1 (3.5%)			
Asian	2 (5.4%)	0 (0%)			
Multiracial	1 (2.7%)	1 (3.5%)			
Unknown/unreported	4 (10.8%)	7 (24.1%)			

p-Values below a significance threshold of $p < 0.05$ are in bold.

[a]Race/ethnicity categories dichotomized into white versus nonwhite for χ^2 tests.

[b]Effect size for *t*-test calculated using Cohen's $d = (M_2 - M_1)/SD_{pooled}$. *d* = effect sizes defined as 0.2 = small, 0.5 = medium, and 0.8 = large. Effect size for χ^2 calculated as $\varphi = \sqrt{\frac{2}{N}}$. φ = effect sizes defined as 0.1 = small, 0.3 = medium, and 0.5 = large.

M = mean; *SD* = standard deviation.

transgender youth deemed ready for gender-affirming medical care from multidisciplinary pediatric academic gender centers.

It is notable that across the two sites, TYC-eligible youth were predominately white and had enough support from parents to pursue gender-affirming medical interventions as minors. Youth also had access to the necessary financial resources to access multidisciplinary care at pediatric academic medical centers. Thus, it is possible that TYC results may be less generalizable to racial/ethnic minority transgender youth, those from less supportive home environments, or youth with limited financial resources. To fill these critical knowledge gaps, future research would benefit from targeted over-recruitment of racial/ethnic minority transgender youth and partnering with community-based health centers that are more likely to provide care for unstably-housed and uninsured/underinsured transgender youth.

Limitations of our study include our inability to compare baseline characteristics of TYC-eligible youth from all four TYC sites given the different models of care related to psychosocial assessment. In addition, while there was some overlap in gender-related measures across Lurie Children's and BCH (e.g., UGDS; BIS), measures of gender-identity acceptance and appearance congruence were only administered at one site as there is no "gold standard" assessment battery for use in pediatric gender health programs.[23] The two sites also administered different measures of psychological functioning, precluding analyses of combined data across the two sites. Finally, it is possible that other variables not measured in this

Table 2. Comparison of Psychological Functioning, Gender Dysphoria, Body Image, and Gender Congruence Scores Based on Trans Youth Care Enrollment Status at Lurie Children's

	Enrolled *M (SD)*	Not Enrolled *M (SD)*	*t* (df)	95% CI	*p*	Cohen's *d*[a]
Parent-Reported Psychological Functioning						
ASI – ADHD Inattentive	8.38 (5.99)	7.85 (4.71)	0.45 (104)	−1.80 to 2.88	0.65	0.09
ASI – ADHD-Hyperactive Impulsive	5.32 (4.74)	3.67 (4.05)	1.73 (104)	−0.24 to 3.54	0.09	0.36
ASI – ADHD-Combined	13.63 (9.63)	11.78 (6.68)	0.98 (102)	−1.88 to 5.57	0.33	0.21
ASI – Conduct Disorder	1.18 (2.14)	1.53 (2.33)	−0.76 (103)	−1.28 to 0.57	0.45	0.16
ASI – Oppositional Defiant Disorder	4.97 (4.08)	4.52 (4.16)	0.53 (103)	−1.26 to 2.17	0.60	0.11
ASI – Generalized Anxiety Disorder	7.54 (4.40)	7.88 (4.62)	−0.37 (106)	−2.18 to 1.49	0.71	0.08
ASI – Separation Anxiety Disorder	0.49 (0.91)	1.15 (1.40)	−2.94 (105)	−1.11 to 0.22	**0.004**	0.61
ASI – Major Depressive Disorder	6.50 (3.90)	7.62 (4.57)	−1.36 (106)	−2.85 to 0.53	0.18	0.27
ASI – Dysthymia	5.81 (3.66)	6.74 (4.04)	−1.18 (106)	−2.48 to 0.63	0.24	0.25
Youth-Reported Psychological Functioning						
YI – ADHD-Inattentive	11.0 (5.4)	9.4 (5.1)	1.54 (110)	−0.48 to 3.81	0.13	0.31
YI – ADHD-Hyperactive Impulsive	8.1 (5.0)	5.8 (3.9)	2.40 (109)	0.40–4.18	**0.02**	0.48
YI – ADHD-Combined	18.9 (9.4)	14.8 (7.6)	2.26 (106)	0.50–7.71	**0.03**	0.46
YI – Conduct Disorder	1.1 (1.4)	0.7 (1.1)	1.66 (109)	−0.09 to 0.99	0.10	0.35
YI – Oppositional Defiant Disorder	5.8 (3.9)	4.7 (4.5)	1.36 (110)	−0.52 to 2.81	0.18	0.28
YI – Generalized Anxiety Disorder	12.1 (5.5)	11.0 (6.1)	0.95 (110)	−1.21 to 3.44	0.34	0.20
YI – Separation Anxiety Disorder	1.2 (1.8)	1.1 (1.8)	0.25 (113)	−0.63 to 0.81	0.80	0.06
YI – Major Depressive Disorder	13.2 (6.5)	11.4 (6.8)	1.28 (111)	−0.94 to 4.39	0.20	0.26
YI – Dysthymia	12.4 (6.2)	10.7 (5.9)	1.31 (111)	−0.85 to 4.14	0.19	0.27
Youth-Reported Measures of Gender Experience						
Utrecht Gender Dysphoria Scale	54.1 (5.3)	53.2 (6.6)	0.78 (118)	−1.35 to 3.09	0.44	0.15
Body Image Scale – Total Score	104.8 (18.5)	103.3 (17.8)	0.40 (118)	−5.71 to 8.58	0.69	0.08
Transgender Congruence Scale – Total Score	2.8 (0.8)	2.7 (0.7)	0.57 (112)	−0.21 to 0.38	0.57	0.11
TCS – Appearance Congruence	2.3 (0.8)	2.2 (0.9)	0.46 (112)	−0.26 to 0.41	0.65	0.09
TCS – Gender Identity Acceptance	4.2 (0.9)	4.1 (0.9)	0.55 (112)	−0.26 to 0.47	0.55	0.11

p-Values below a significance threshold of $p < 0.05$ are in bold.

[a]Cohen's $d = (M_2 - M_1)/SD_{pooled}$. d = effect sizes defined as 0.02 = small, 0.5 = medium, and 0.8 = large. $SD\ pooled = \frac{M_1 - M_2}{\sqrt{\frac{(n_1-1)*(SD_1{}^2)+(n_2-1)*(SD_2{}^2)}{(n_1+n_2-2)}}}$

M, mean; *SD,* standard deviation; CI, confidence interval; ASI, Adolescent Symptom Inventory; YI, Youth Inventory; ADHD, attention deficit/hyperactivity disorder; TCS, Transgender Congruence Scale.

Table 3. Comparison of Psychological Functioning, Gender Dysphoria, and Body Image Scores Based on Trans Youth Care Enrollment Status at Boston Children's Hospital

	Enrolled *M (SD)*	Not Enrolled *M (SD)*	*t* (df)	95% CI	*p*	Cohen's *d*[a]
Parent-Reported Psychological Functioning						
CBCL – Total Problems Scale *T*-score	55.4 (11.4)	56.4 (11.3)	0.31 (46)	−5.70 to 7.78	0.76	0.09
CBCL – Internalizing Problems *T*-score	59.24 (11.64)	60.53 (12.44)	0.36 (46)	−5.82 to 8.39	0.72	0.11
CBCL – Externalizing Problems *T*-score	48.38 (9.25)	47.89 (44.49)	−0.16 (46)	−6.53 to 5.57)	0.97	−0.05
CBCL – Anxious/Depressed *T*-score	60.10 (7.42)	63.84 (9.57)	1.52 (46)	−1.21 to 8.69	0.13	0.45
CBCL – Withdrawn *T*-score	62.34 (10.06)	62.58 (9.01)	0.08 (46)	−5.51 to 5.98	0.93	0.02
CBCL – Somatic Complaints *T*-score	58.24 (7.74)	57.00 (7.20)	−0.56 (46)	−5.71 to 3.23	0.58	−0.16
CBCL – Social Problems *T*-score	56.55 (7.54)	55.53 (5.92)	−0.50 (46)	−5.15 to 3.10	0.62	−0.15
CBCL – Attention Problems *T*-score	55.59 (6.67)	56.74 (7.19)	0.57 (46)	−2.93 to 5.23	0.57	0.17
CBCL – Aggressive Behavior *T*-score	53.17 (4.51)	53.42 (4.75)	0.18 (46)	−2.49 to 2.99	0.86	0.05
Youth-Reported Psychological Functioning						
YSR – Total Problems Scale *T*-score	54.21 (7.34)	55.83 (10.03)	0.64 (45)	−3.48 to 6.74	0.52	0.19
YSR – Internalizing Problems *T*-score	55.28 (12.26)	58.61 (12.52)	0.90 (45)	−4.13 to 10.80	0.37	0.27
YSR – Externalizing Problems *T*-score	47.59 (9.11)	50.22 (8.96)	0.97 (45)	−2.84 to 8.11	0.34	0.29
YSR – Anxious/Depressed *T*-score	57.00 (12.54)	60.67 (11.58)	1.00 (45)	−3.69 to 11.03	0.32	0.30
YSR – Withdrawn *T*-score	57.55 (13.30)	60.00 (10.36)	0.66 (45)	−4.97 to 9.87	0.51	0.20
YSR – Somatic Complaints *T*-score	52.69 (10.66)	58.44 (8.79)	1.92 (45)	−0.29 to 11.79	0.06	0.58
YSR – Social Problems *T*-score	54.31 (11.36)	56.17 (5.17)	0.76 (42.1)	−3.89 to 7.61	0.52	0.20
YSR – Attention Problems *T*-score	55.24 (12.83)	57.33 (8.04)	0.69 (45)	−4.71 to 5.89	0.49	0.18
YSR – Aggressive Behavior *T*-score	50.21 (8.68)	52.50 (3.68)	1.25 (40.9)	−1.41 to 5.99	0.22	0.32
Youth-Reported Measures of Gender Experience						
Utrecht Gender Dysphoria Scale	53.04 (9.54)	54.22 (4.48)	0.54 (48)	−2.93 to 5.31	0.59	0.15
Body Image Scale – Total Score	105.5 (18.5)	103.1 (12.5)	−0.57 (52)	−10.86 to 6.09	0.57	−0.15

[a]Cohen's $d = (M_2 - M_1)/SD_{pooled}$. d = effect sizes defined as 0.2 = small, 0.5 = medium, and 0.8 = large. $SD\ pooled = \frac{M_1 - M_2}{\sqrt{\frac{(n_1-1)*(SD_1{}^2)+(n_2-1)*(SD_2{}^2)}{(n_1+n_2-2)}}}$

M, mean; *SD*, standard deviation; CI, confidence interval; CBCL, Child Behavior Checklist; YSR, Youth Self-Report.

study may differ between enrolled and nonenrolled youth. For instance, socioeconomic status could affect ability to travel to study sites, and parental education level may influence perceived importance of or interest in research participation.

Conclusions

These study findings show that TYC-enrolled youth do not appear to differ systematically from eligible but nonenrolled youth based on age, race/ethnicity, gender identity, designated sex at birth, psychological functioning, or experiences of gender-related distress. Results of the present analysis suggest that TYC findings will generalize to adolescents seeking gender-affirming hormone treatment in a pediatric academic setting irrespective of sociodemographic characteristics or patterns of psychological functioning and gender-related distress.

Disclaimer

The context is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. Preliminary data were presented at the 2018 meeting of the World Professional Association of Transgender Health.

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Abbreviations Used

ADHD = attention deficit/hyperactivity disorder
ASI = Adolescent Symptom Inventory
BCH = Boston Children's Hospital
BIS = Body Image Scale
CBCL = Child Behavior Checklist
CHLA = Children's Hospital Los Angeles
TCS = Transgender Congruence Scale
TYC = Trans Youth Care
UGDS = Utrecht Gender Dysphoria Scale
YI = Youth Inventory
YSR = Youth Self-Report