Nonconforming Gender Expression and Associated Mental Distress and Substance Use among High School Students in Three U.S. School Districts

2017 ASHA School Health Conference

Richard Lowry MD, MS
Michelle Johns, MPH, PhD
Leah Robin, PhD
Laura Kann, PhD

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Disclosure statement

- Richard Lowry, MD, MS
  - I do not have any financial conflicts to disclose.
Background

- **Gender norms**
  - The cultural roles and expectations attributed to men and women based on their sex

- **Gender nonconformity (GNC)**
  - Gender expression that differs from societal expectations for masculine or feminine appearance and behavior
  - Experience increased social stress
  - Social stress associated with increased mental distress and substance use

- **GNC under-researched area of adolescent health**
  - Little is known about associations of GNC with mental distress and substance use among adolescents
Purpose of study

➢ To examine associations between GNC and mental distress and substance use among adolescents
METHODS
Data source

- 2015 school district Youth Risk Behavior Surveys (YRBS)
  - 19 large urban school districts
  - Representative of public school students in grades 9-12 in jurisdiction

- Sampling & survey administration methods
  - Independent 2-stage cluster sample design
  - Administered in classroom (regular class period)
  - Computer-scannable questionnaire booklets or answer sheets
  - Participation anonymous and voluntary
  - Parental consent and IRB review
Study population

- In 2015, three school districts asked questionnaire items that assessed both gender expression and sexual identity
  - Broward County, FL (Ft. Lauderdale)
  - Los Angeles, CA
  - San Diego, CA

- Overall response rates and sample sizes (N)
  - Broward County, FL: 72% (N=1,413)
  - Los Angeles, CA: 81% (N=2,336)
  - San Diego, CA: 88% (N=2,333)

- Final combined data set representative of students in grades 9-12 in these three school districts (N=6,082)
Main study measures

- **Gender expression**
  - "A person’s appearance, style, dress, or the way they walk or talk may affect how people describe them. How do you think people would describe you?"
    - 7-point scale: Very Feminine to Very Masculine

- **Sex**
  - "What is your sex?"
    - Female; Male

- **Sexual identity**
  - "Which of the following best describes you?"
    - Heterosexual (straight); Gay or lesbian; Bisexual; Not sure
Main study variables

- Gender nonconformity (GNC) scale
  - Continuous GNC: 1 (most conforming) to 7 (most nonconforming)
    - 1 = Very feminine females & very masculine males
    - 2 = Mostly feminine females & mostly masculine males
    - 3 = Somewhat feminine females & somewhat masculine males
    - 4 = Equally feminine and masculine students
    - 5 = Somewhat masculine females & somewhat feminine males
    - 6 = Mostly masculine females & mostly feminine males
    - 7 = Very masculine females & very feminine males
Main study variables

- Gender nonconformity (GNC) scale
  - Categorical GNC: Low GNC (Referent); Moderate GNC; High GNC
    - Low GNC = Very, mostly, somewhat feminine females & Very, mostly, somewhat masculine males
    - Moderate GNC = Equally feminine and masculine students
    - High GNC = Very, mostly, somewhat masculine females & Very, mostly, somewhat feminine males
Health risk behaviors examined

- Mental distress indicators
  - Sad and hopeless
  - Seriously considered suicide
  - Made a suicide plan
  - Attempted suicide

- Substance use
  - Cigarette use
  - Alcohol use
  - Marijuana use
  - Nonmedical use of prescription drugs
  - Cocaine use
  - Methamphetamine use
  - Heroin use
  - Injection drug use
Data analysis

- Statistical software and techniques
  - SUDAAN software
  - Sex-stratified and adjusted for race/ethnicity, grade, sexual identity
  - Prevalence estimates based on <30 observations not shown
Data analysis

- Analytic plan
  - Continuous GNC analysis
    - Linear trend
    - Nonlinear (quadratic) trend
  - Categorical GNC analysis
    - Adjusted prevalence ratio (APR); Low GNC referent group
    - Linear contrast t-tests; Compare Moderate GNC to High GNC groups
  - Statistical significance
    - Chi square, t-test, linear/quadratic trends and APR significant if $p < 0.05$
RESULTS
Prevalence and frequency of gender nonconformity (GNC) by sex – high school students in three US school districts

<table>
<thead>
<tr>
<th>Gender nonconformity (GNC) scale</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>(n)</td>
</tr>
<tr>
<td>Categorical</td>
<td>%</td>
<td>(n)</td>
</tr>
<tr>
<td>Continuous (1-7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low GNC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Very conforming</td>
<td>30.6</td>
<td>(874)</td>
</tr>
<tr>
<td>2 = Mostly conforming</td>
<td>35.3</td>
<td>(985)</td>
</tr>
<tr>
<td>3 = Somewhat conforming</td>
<td>16.6</td>
<td>(470)</td>
</tr>
<tr>
<td>Moderate GNC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 = Equally feminine &amp; masculine</td>
<td>13.5</td>
<td>(375)</td>
</tr>
<tr>
<td>High GNC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 = Somewhat nonconforming</td>
<td>2.2</td>
<td>(62)</td>
</tr>
<tr>
<td>6 = Mostly nonconforming</td>
<td>0.9</td>
<td>(29)</td>
</tr>
<tr>
<td>7 = Very nonconforming</td>
<td>0.8</td>
<td>(22)</td>
</tr>
</tbody>
</table>

Low GNC = Very, mostly, or somewhat feminine female students; Very, mostly, or somewhat masculine male students.
Moderate GNC = Equally feminine and masculine students.
High GNC = Very, mostly, or somewhat masculine female students; Very, mostly, or somewhat feminine male students.
Prevalence of gender nonconformity (GNC) by sex and sexual identity – high school students in three US school districts

<table>
<thead>
<tr>
<th>Demographic group</th>
<th>Low GNC</th>
<th>Moderate GNC</th>
<th>High GNC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>(95% CI)</td>
<td>%</td>
</tr>
<tr>
<td>Total</td>
<td>79.7</td>
<td>(78.2, 81.1)</td>
<td>11.9</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>82.5</td>
<td>(80.7, 84.2)</td>
<td>13.5</td>
</tr>
<tr>
<td>Male</td>
<td>76.8</td>
<td>(74.1, 79.3)</td>
<td>10.2</td>
</tr>
<tr>
<td>Sexual identity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>84.0</td>
<td>(82.6, 85.4)</td>
<td>9.6</td>
</tr>
<tr>
<td>Lesbian/gay</td>
<td>37.0</td>
<td>(26.8, 48.4)</td>
<td>21.3</td>
</tr>
<tr>
<td>Bisexual</td>
<td>54.2</td>
<td>(48.1, 60.3)</td>
<td>30.1</td>
</tr>
<tr>
<td>Not sure</td>
<td>58.8</td>
<td>(50.2, 66.8)</td>
<td>26.9</td>
</tr>
</tbody>
</table>

Chi Square test
by Sex: p<0.001
by Sexual identity: p<0.001
Mental distress indicators by gender nonconformity and sex – high school students in three US school districts

Feeling sad and hopeless (%)*

* During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities? (Yes vs. No)

Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.
Mental distress indicators by gender nonconformity and sex – high school students in three US school districts

Seriously considered attempting suicide (%)*

* During the past 12 months, did you ever seriously consider attempting suicide? (Yes vs. No)
Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.
Mental distress indicators by gender nonconformity and sex – high school students in two** US school districts

Made a suicide plan (%)*

* During the past 12 months, did you make a plan about how you would attempt suicide? (Yes vs. No)
Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.

** This question was not asked by San Diego.
Mental distress indicators by gender nonconformity and sex – high school students in three US school districts

Attempted suicide (%)*

* During the past 12 months, how many times did you actually attempting suicide? (≥1 vs. 0)
Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.
Substance use by gender nonconformity and sex – high school students in three US school districts

Nonmedical use of prescription drugs (%)*

* During your life, how many times have you taken a prescription drug (such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin, or Xanax) without a doctor’s prescription? (≥1 vs. 0)

Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.
Substance use by gender nonconformity and sex – high school students in three US school districts

Cocaine use (%)*

* During your life, how many times have you used any form of cocaine, including powder, crack, or freebase? (≥1 vs. 0)
Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.
Substance use by gender nonconformity and sex – high school students in three US school districts

Methamphetamine use (%)*

* During your life, how many times have you used methamphetamines (also called speed, crystal, crank, or ice)? (≥1 vs. 0)
Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.
Substance use by gender nonconformity and sex – high school students in three US school districts

Heroin use (%)*

* During your life, how many times have you used heroin (also called smack, junk, or China White)? (≥1 vs. 0)
Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.
Substance use by gender nonconformity and sex – high school students in three US school districts

Injection drug use (%)*

* During your life, how many times have you used a needle to inject any illegal drug into your body? (≥1 vs. 0)
Prevalence adjusted for race/ethnicity, grade, and sexual identity. Statistical significance for trend = p<0.05.
### Mental distress indicators by gender nonconformity (GNC) and sex – high school students in three US school districts

<table>
<thead>
<tr>
<th>Demographic group</th>
<th>Mental distress indicator</th>
<th>Low GNC (Ref)</th>
<th>Moderate GNC</th>
<th>High GNC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>APR</td>
<td>%</td>
</tr>
<tr>
<td>Female students</td>
<td>Sad/hopeless</td>
<td>35.4</td>
<td>1.0</td>
<td>49.4</td>
</tr>
<tr>
<td></td>
<td>Seriously considered suicide</td>
<td>16.8</td>
<td>1.0</td>
<td>31.6</td>
</tr>
<tr>
<td></td>
<td>Made suicide plan</td>
<td>12.6</td>
<td>1.0</td>
<td>26.5</td>
</tr>
<tr>
<td></td>
<td>Attempted suicide</td>
<td>9.7</td>
<td>1.0</td>
<td>14.9</td>
</tr>
<tr>
<td>Male students</td>
<td>Sad/hopeless</td>
<td>19.9</td>
<td>1.0</td>
<td>34.3</td>
</tr>
<tr>
<td></td>
<td>Seriously considered suicide</td>
<td>9.4</td>
<td>1.0</td>
<td>14.6</td>
</tr>
<tr>
<td></td>
<td>Made suicide plan</td>
<td>9.5</td>
<td>1.0</td>
<td>14.6</td>
</tr>
<tr>
<td></td>
<td>Attempted suicide</td>
<td>4.4</td>
<td>1.0</td>
<td>9.3</td>
</tr>
</tbody>
</table>

\textsuperscript{L} = Significantly different than Low GNC. \textsuperscript{M} = Significantly different than moderate GNC. Statistical significance = \( p < 0.05 \).

APR = Adjusted (for race/ethnicity, grade, and sexual identity) prevalence ratio.
## Substance use by gender nonconformity (GNC) and sex – high school students in three US school districts

<table>
<thead>
<tr>
<th>Demographic group</th>
<th>Substance use</th>
<th>Low GNC (Ref)</th>
<th>Moderate GNC</th>
<th>High GNC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>APR</td>
<td>%</td>
<td>APR</td>
</tr>
<tr>
<td>Female students</td>
<td>Cigarette use</td>
<td>3.1</td>
<td>1.0</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>Alcohol use</td>
<td>26.8</td>
<td>1.0</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>Marijuana use</td>
<td>17.5</td>
<td>1.0</td>
<td>19.1</td>
</tr>
<tr>
<td></td>
<td>Nonmedical use of Rx drugs</td>
<td>9.5</td>
<td>1.0</td>
<td>12.4</td>
</tr>
<tr>
<td></td>
<td>Cocaine use</td>
<td>4.0</td>
<td>1.0</td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td>Methamphetamine use</td>
<td>2.0</td>
<td>1.0</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>Heroin use</td>
<td>1.3</td>
<td>1.0</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Injection drug use</td>
<td>1.6</td>
<td>1.0</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**APR** = Adjusted (for race/ethnicity, grade, and sexual identity) prevalence ratio.
**L** = Significantly different than Low GNC. **M** = Significantly different than moderate GNC. Statistical significance = p<0.05.
### Substance use by gender nonconformity (GNC) and sex – high school students in three US school districts, cont’d

<table>
<thead>
<tr>
<th>Demographic group</th>
<th>Substance use</th>
<th>Low GNC (Ref)</th>
<th>Moderate GNC</th>
<th>High GNC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>APR</td>
<td>%</td>
</tr>
<tr>
<td>Male students</td>
<td>Cigarette use</td>
<td>5.8</td>
<td>1.0</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Alcohol use</td>
<td>24.4</td>
<td>1.0</td>
<td>19.9</td>
</tr>
<tr>
<td></td>
<td>Marijuana use</td>
<td>21.6</td>
<td>1.0</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>Nonmedical use of Rx drugs</td>
<td>11.2</td>
<td>1.0</td>
<td>11.6</td>
</tr>
<tr>
<td></td>
<td>Cocaine use</td>
<td>4.7</td>
<td>1.0</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>Methamphetamine use</td>
<td>2.8</td>
<td>1.0</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>Heroin use</td>
<td>1.7</td>
<td>1.0</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>Injection drug use</td>
<td>1.0</td>
<td>1.0</td>
<td>3.2</td>
</tr>
</tbody>
</table>

APR = Adjusted (for race/ethnicity, grade, and sexual identity) prevalence ratio.
L = Significantly different than Low GNC. M = Significantly different than moderate GNC. Statistical significance = p<0.05.
DISCUSSION
Conclusions

- First study of high school students in the United States to examine associations of GNC with mental distress & substance use behaviors
  - GNC was associated with mental distress among female and male students
  - GNC was associated with substance use among male students
What factors may underlie these associations?

- Associations with mental distress
  - GNC associated with increased social stress
    - Social stress associated with mental distress
  - Differences by sex in suicidal thoughts and behaviors
    - Females more likely to report suicidal thoughts/non-fatal attempts
    - Males more likely to successfully complete suicide
What factors may underlie these associations?

Associations with substance use (among GNC males)

- GNC is associated with increased social stress
  - Social stress associated with substance use
- Social stress experienced by GNC males more toxic than GNC females
  - GNC is considered less problematic among female than male youth
    - Masculinity is generally more valued than femininity by society
    - “Tomboys” vs “Sissies”
  - GNC less likely to be perceived as associated with sexual orientation among female than male youth
    - Disparities in substance use by sexual orientation reduced or eliminated when controlling for social stress
Limitations

- **General**
  - Data apply only to youth who attend school
  - Extent of under- or over-reporting cannot be determined
  - Data are cross-sectional (indicate association not causality)

- **Population-specific**
  - Students may not know (or be unwilling to disclose) sexual identity
  - Small sample sizes at the most nonconforming end of the spectrum
  - Gender identity was not assessed
Implications for school health

- Safe and supportive school environments may play an important role in improving mental health and reducing substance use among gender nonconforming students.

- Developing school support systems for GNC students:
  - Safe spaces and school staff contacts
  - Professional development for school staff on gender issues
  - Health education includes issues of gender and gender expression
  - Anti-bullying policies / bystander interventions
Nonconforming Gender Expression and Associated Mental Distress and Substance Use among High School Students in Three U.S. School Districts

2017 ASHA School Health Conference

Richard Lowry MD, MS
Michelle Johns, MPH, PhD
Leah Robin, PhD
Laura Kann, PhD

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.