Journal of Adolescent Health xxx (2016) 1–6

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Original article

Social Epidemiology of Depression and Anxiety by Gender Identity

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Article history: Received December 21, 2015; Accepted April 14, 2016
Keywords: Transgender; Mental health; Depression; Anxiety; Health disparities

A B S T R A C T

Purpose: This study investigates depression and anxiety in gender minority (i.e., transgender and/or gender nonconforming) compared with nongender minority (cisgender) young adults.
Methods: Data were from the Growing Up Today Study, a national cohort of U.S. young adults. A two-step method (maternal-reported natal sex in 1996 cross-classified with participant-reported current gender identity in 2010) was used to identify gender minority and nongender minority respondents (n = 7,831; mean age = 26 years). Differences in past week depressive symptoms and anxious symptoms were examined cross-sectionally by gender identity. Gender minority and nongender minority respondents were compared using age-adjusted logistic regression models.
Results: In gender minorities, the prevalence of depressive and anxious symptoms meeting clinical cutoffs was 52% and 38%, respectively, compared with nongender minorities (27% and 30% in females and 25% and 14% in males; $p < .01$).
Conclusions: Gender identity is an understudied social determinant of mental health. Surveillance efforts to monitor mental health disparities should include survey questions to assess gender identity in epidemiologic research. Research and interventions to understand and ameliorate mental health disparities by gender identity are needed.

IMPLICATIONS AND CONTRIBUTION

Gender identity is an understudied social determinant of mental health. This study contributes epidemiologic data showing a higher prevalence of depressive and anxious symptoms in gender minorities (i.e., transgender and/or gender nonconforming) relative to nongender minorities in an U.S. cohort of young adults.

In the United States, depression and generalized anxiety represent serious public health problems [1–3]. The estimated prevalence of depression is 29.9% (lifetime) and 8.6% (past 12 months), and generalized anxiety is 9.0% (lifetime) and 2.0% (past 12 months) evaluated via clinical diagnostic interview [2], with higher prevalence in studies utilizing screening scales, subthreshold clinical cut point, or broadened/relaxed clinical diagnostic criteria requiring shorter duration of symptoms [4,5]. Young adulthood represents the most common developmental period of onset for depression and generalized anxiety in the United States with median age of onset between ages 23 and 30 years [2].

Gender differences in depression and anxiety have been consistently found with females about twice as likely to have

Conflicts of Interest: The authors have no financial conflicts of interest to disclose.
Disclaimer: The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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1054-139X/
http://dx.doi.org/10.1016/j.jadohealth.2016.04.006

mood disorders compared with males [6–9]. Despite the research attention and interest in gender differences, no national U.S. studies that we are aware of have moved beyond a binary conceptualization of gender to examine the epidemiology of depression and anxiety in gender minorities compared with nongender minorities. *Gender minority* refers to transgender and/or gender nonconforming people whose sex assigned at birth is different from their current gender identity [10]. Gender identity refers to a person's internal, felt sense of self as male, female, transgender, or another diverse nonbinary gender identity [11].

In the past decade, there has been increasing research in gender minority health applying a depathologizing framework to understand the health of transgender and gender nonconforming people [10,12]. In the mental health realm, this framework has moved research away from conceptualizing gender minorities as "disordered" to recognizing the mental health concerns that gender minority people face, many of which may be the result of stress- and stigma-related processes due to social exclusion [13,14]. In community and clinic samples of gender minority youth [15–17] and adults [18–21], depression and anxiety are highly prevalent. However, few U.S. comparative epidemiologic data exist to examine whether gender minorities experience higher levels of depression and anxiety relative to nongender minority populations [22]. A barrier to monitoring the physical and mental health of U.S. transgender and gender nonconforming populations is the lack of inclusion of survey items on population-level and epidemiologic surveys with which to identify gender minority respondents [10,23]. Using data from a large national prospective cohort of young adults in the United States, the present study sought to fill this empirical gap. We examine the social epidemiology of depression and anxiety by gender identity, comparing gender minority and nongender minority young adults.

Methods

Participants

The Growing Up Today Study 1 (GUTS1) is a national longitudinal cohort of children of participants of the Nurses' Health Study II (NHSII), a prospective cohort of female registered nurses across the United States. At enrollment in 1996, the GUTS sample consisted of >16,000 youth ages 9–14 years (7,843 boys and 9,039 girls) [24]. GUTS1 participants have completed quantitative assessments assessing their health and health-related indicators approximately every 2 years since 1996. The institutional review board at Brigham and Women's Hospital approved the GUTS1 study. Activities for the present study were approved by the Brigham and Women's Hospital institutional review board. To be included in secondary analyses, GUTS1 participants had to complete the gender identity question asked in the 2010 survey wave (n = 7,831). A complete case analysis (i.e., listwise deletion) has been found to yield nonbiased estimates in the GUTS1 cohort [25]. As with other GUTS1 analyses using data from the 2010 wave [26,27], a higher proportion of 2010 wave respondents were female versus male (maternal-reported natal sex at baseline in 1996) as compared with baseline enrollment ($p < .05$).

Measures

Gender minority. A two-step method was used to identify gender minority and cisgender respondents (Step 1: assigned sex at birth; Step 2: current gender identity) [28]. Natal sex (male or female) at baseline in 1996 was reported by respondents' mothers when GUTS1 participants were first enrolled. A single-item gender identity measure [28] was asked in the 2010 GUTS1 questionnaire wave: "How do you describe yourself?" with the response options: "Female," "Male," "Transgender," and "Do not identify as female, male, or transgender." Gender identity was operationalized by cross-classifying sex and gender as follows: (1) "Male," respondents who completed the boys survey at baseline in 1996 and checked "Male" on the gender identity 2010 item; (2) "Female," respondents who completed the girls survey at baseline in 1996 and checked "Female"; and (3) "Gender minority" participants who selected who indicated a cross-sex identity (i.e., filled out the boys survey at baseline in 1996 and identified as "Female" on the gender identity item in 2010), "Transgender," or "Do not identify as male, female, or transgender."

Depression. Depressive distress was assessed using the validated and reliable 10-item Center for Epidemiologic Studies Depression Scale [29], a screener used widely with adolescent and young adult populations [26,30,31]. GUTS1 participants were asked to indicate how often in the past week they felt or behaved certain ways on a response scale ranging from 0 = rarely/never to 3 = all the time (e.g., "During the past week, I was bothered by things that usually do not bother me"). After reverse coding two items, scores were summed. Items correlated from .10 to .51 ($p < .0001$). Scores ranged from 0 to 30, and higher scores indicated more depressive distress (Cronbach's $\alpha = .81$). As in previous research [30], a clinical cut point of 10-item Center for Epidemiologic Studies Depression score ≥10 was used to categorize a positive screen for clinically significant depressive distress.

Anxiety. Anxious distress was assessed with nine items from the Worry/Sensitivity Subscale of the Revised Children's Manifest Anxiety Scale (RCMAS; the "What I Think and Feel" instrument) [32]. The RCMAS [33–35] and the Worry/Sensitivity Subscale [36] are well validated in youth. Of RCMAS subscales, this subscale most closely represents the excessive worry characteristic of generalized anxiety disorder as outlined in the *Diagnostic and Statistical Manual of Mental Disorders IV-Text Revision* (DSM-IV-TR) [37]. Participants were asked how often in the past week they felt symptoms of anxiety on a Likert-response scale ranging from 0 = none of the time to 5 = all of the time (e.g., "I worry about what is going to happen," "I worry about what other people think about me," "I am nervous"). Item scores were summed, with a higher scores indicating more anxious distress. Scores ranged from 0 to 45 (Cronbach's $\alpha = .93$). Items correlated from .49 to .76 ($p < .0001$). Scores were categorized to create a binary indicator of a clinically significant elevation in anxious distress, using scores at or above the 75% percentile (score ≥ 18).

Demographic characteristics. Age (in years) was reported in 2010. Race/ethnicity was reported in 1996 and was categorized as a binary indicator of any racial/ethnic minority (yes/no).

Data analysis

SAS, version 9.3 (SAS Institute, Cary, NC), was used for all statistical analyses. The univariate distribution of all variables (frequency, proportion, mean, standard deviation) was examined by gender identity (gender minority vs. nongender minority