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Perception of Community Tolerance and Prevalence of Depression among Transgender Persons

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Abstract

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AUTHOR DISCLOSURE STATEMENT

No competing financial interests exist.

Purpose—The goal of the study was to examine the association between depression and perceived community tolerance after controlling for various demographic and personal characteristics, treatment receipt, and past experiences with abuse or discrimination.

Methods—An on-line survey assessed depressive symptoms among transgender and gender non-conforming individuals. Depression was assessed using the 7-item Beck Depression Inventory for Primary Care (BDI-PC) and the 10-item Center for Epidemiologic Studies Depression (CESD-10) scale.

Results—The prevalence ratios (95% confidence intervals) comparing depression in persons who did and did not perceive their area as tolerant were 0.33 (0.20–0.54) for BD-PC and 0.66 (0.49–0.89) for CESD-10. Other factors associated with depression were experience with abuse or discrimination, lower education, and unfulfilled desire to receive hormonal therapy.

Conclusion—Depression was common in this sample of transgender and gender non-conforming individuals and was strongly and consistently associated with participants' perceptions of community tolerance, even after adjusting for possible confounding. The association between desire to receive hormonal therapy and depression is a finding that warrants further exploration. Future research should also assess depression and changes in perception of community tolerance in transgender individuals before and after initiation of gender confirmation treatment.

Keywords

Transgender/Transsexual; Mental health; Gender identity

INTRODUCTION

The term 'transgender' is used to describe the state in which an individual's gender identity (male, female, both or neither) is not congruent with the individual's gender assigned by others based on natal sex (Grossman & D'Augelli, 2007). Individuals who identify as transgender are particularly vulnerable to mental health problems including depression (Hoffman, 2014). Depression can not only decrease an individual's quality of life but it is also associated with other health problems including cardiovascular, metabolic and lung diseases as well as higher mortality rates (Bisschop, Kriegsman, Deeg, Beekman, & van Tilburg, 2004; Han, 2002; Kessler et al., 2006; Patten, 2005). Among transgender persons, depression has also been linked to substance abuse, high risk sexual behaviors, and most notably, suicide (Blosnich et al., 2013; Nuttbrock et al., 2013, 2014).

The disproportionate rate of depression among members of the transgender community may be due, in part, to their experiences with abuse and discrimination ("enacted stigma"). For example, in a study with low-income Latina transwomen, there was a notable association between self-reported history of sexual partner violence and depression severity; further, individuals who reported more frequent experiences with discrimination were more likely to be identified with severe depression (Bazargan & Galvan, 2012). In another study, experiences with gender-based victimization and discrimination were independently associated with depression and attempted suicide (Clements-Nolle, Marx, & Katz, 2006). Evidence also suggests that the high rates of depression experienced by many transgender individuals could be due to fear or expectation of abuse and discrimination ("felt stigma" or

"perceived stigma") (Hoffman, 2014; Lombardi, Wilchins, Priesing, & Malouf, 2001; Stotzer, 2008). An important source of perceived stigma in a minority group is the perception that one's community is intolerant towards that group (Institute of Medicine, 2011). Qualitative studies have demonstrated that perceived stigma may negatively affect the mental health of transgender individuals (Bockting, Robinson, & Rosser, 1998; Nemoto, Sausa, Operario, & Keatley, 2006); however, quantitative data assessing the association between perceived stigma and depression among transgender or gender-non-conforming persons are lacking.

Considering existing gaps in knowledge, we sought to assess the relationship between perceived community tolerance and depressive symptoms in a sample of individuals who attended or were interested in attending an annual conference of a major transgender social networking organization. The goal of the analysis was to examine the association between depression and perceived community tolerance (a measure of perceived stigma) after controlling for possible confounders, including demographic and personal characteristics and past experiences with abuse or discrimination (enacted stigma). Hormonal treatment and/or sex confirmation surgical treatment was also included as possible confounding variables, as previous research suggests that receipt of these therapies may be associated with less severe depression symptoms and better quality of life (Gorin-Lazard et al., 2012; Gorin-Lazard et al., 2013).

METHODS

Data for the study were obtained from the "Transgender Health Survey." The survey was approved by the Institutional Review Board and was administered via social media sites of a transgender education and social networking organization. A link to the survey was posted from October 2012 through the end of 2013. The survey was entirely anonymous. Once participants accessed the study website, they were taken through an informed consent process to ensure their understanding of the study's purpose, procedures, risks and discomforts, benefits, and confidentiality. The Emory University Internal Review Board approved the study.

The survey responders were asked about their sex assigned at birth and then queried about their current gender identity. Eligible responders were persons over 18 years of age whose self-identified gender was different from the binary male/female categories assigned at birth. Five persons who reported being born with intersex conditions were excluded from the current analysis.

The presence of depression was assessed using two instruments the 7-item Beck Depression Inventory for Primary Care (BDI-PC) and the 10-item Center for Epidemiologic Studies Depression (CESD-10) scale (Andresen, Malmgren, Carter, & Patrick, 1994; Steer, Cavalieri, Leonard, & Beck, 1999). The two instruments, although similar, measure different aspects of depression and therefore should not be used interchangeably (Skorikov & Vandervoort, 2003). The BDI-PC is used to identify major depression disorders (MDD) among patients with medical problems and is often applied in a clinical setting (Steer et al., 1999). By contrast, the CESD-10 was developed and is more commonly used for assessing

depression symptoms in population based studies (Andresen et al., 1994). The use of two measures of depression permitted evaluating the robustness of the study findings.

The BDI-PC instrument includes seven questions that evaluate domains of sadness, pessimism, past failure, self-dislike, self-criticalness, suicidal thoughts or wishes, and loss of interest. Respondents answer each BDI-PC question using a scale ranging from 0 meaning absent to 3 meaning severe. The responses are then added together to obtain a score for each person. The cutoff of 4 has been found to have the highest sensitivity (97%) and specificity (99%) for distinguishing between persons with and without MDD (Steer et al., 1999).

The CESD-10 is a subset of the full 20-item scale reflecting various symptoms of depression. The instrument uses a 4-point scale (from 0 to 3) with higher scores representing greater extent of symptoms. A score of 10 or higher is used as the cutoff to indicate presence of "significant depressive symptoms" (Yi et al., 2006). The main dependent variables in the current study were responses to the BDI-PC and CESD-10 questionnaires with total scores dichotomized using the above cutoffs.

To assess each participant's opinion about the level of tolerance towards transgender individuals in the surrounding community the survey included a question: "*How strongly do you agree or disagree with the following statement: Most people in my area are tolerant of transgender persons*". This question was adapted from a similar item on tolerance towards gay and bisexual persons used in the National HIV Behavioral Surveillance system.(Reilly et al., 2015) The five-point Likert scale response options included "Strongly agree" (1), "Agree" (2), "Neither agree nor disagree" (3), "Disagree" (4) and "Strongly disagree" (5). The main independent variable "from a tolerant area" was dichotomized as 1–2 (yes) vs. 3–5 (no).

Recent past experience with various aspects of abuse or discrimination (enacted stigma) was assessed using five items that were preceded by a question "*During the past 12 months, have any of the following things happened to you because someone knew or assumed you were transgender*?" The five items included the following: 1) you were called names or insulted, 2) you received poorer services than other people in restaurants, stores, other businesses or agencies, 3) you were treated unfairly at work or school; 4) you were denied or given lower quality health care, and 5) you were physically attacked or injured. This part of the survey was also adapted from the corresponding instrument used in the National HIV Behavioral Surveillance system.(Reilly et al., 2015) For the purpose of the current analysis past experience with abuse or discrimination was categorized as none, one aspect (for persons who responded "Yes" to one of the five items) and two or more aspects (for persons who responded "Yes" to at least two of the five items).

Receipt or plans to receive gender confirmation treatment were assessed using two variables – one for hormonal therapy, and one for surgical procedures. For hormonal therapy, participants were categorized as 1) not receiving and not planning to receive; 2) not receiving, but planning to receive, and 3) currently receiving. The corresponding categories for surgery included 1) never had and not planning, 2) never had but planning and 3) already underwent at least one of the (chest or genital) procedures.

All eligible participants were categorized as trans-women, trans-men, or other. The category "other" included a heterogeneous group of individuals who described themselves in a way that precluded binary gender assignment (e.g., genderqueer, gender-fluid, or androgynous). Additional questions collected information about the participant's race and ethnicity, education, and relationship status (single vs. married, in civil union, or in other committed relationship). With respect to race and ethnicity, participants were categorized as "Non-Hispanic Whites" vs. "Other." The "Other" group included persons who self-identified as Hispanic or Latino, American Indian or Alaska Native, Asian, Black, or Native Hawaiian or Other Pacific Islander, multiracial, or those who declined to be associated with any group. We used category "Other" because numbers of people representing specific racial/ethnic minority groups were too small to allow meaningful analysis. Persons who reported receiving a four-year college or a graduate degree were compared to those who did not complete college.

Study participants from tolerant and not tolerant areas were compared with respect to frequency and distribution of various demographic and personal characteristics, and with respect to their responses to BDI-PC and CESD-10 questions. All comparisons were performed using chi-square tests.

Multivariable analyses of the associations between being from a tolerant area and depression were carried out using modified logistic regression models with adjusted prevalence ratios (aPR) and corresponding 95% confidence intervals (CIs) obtained using the 'rlogist' procedure in the SAS-callable SUDAAN statistical software package. Each model controlled for race/ethnicity, gender identity, age, relationship status, education, treatment receipt and past experience with abuse or discrimination. The covariates for the model were selected using a priori knowledge about risk factors for depression in this population. All models were examined for two-way interactions between the main independent variable (being from a tolerant area) and each of the covariates.

RESULTS

A total of 570 individuals visited the survey site. After exclusion of individuals whose current gender identity matched their natal assigned sex (n=89), and persons who self-identified as having intersex conditions (n=10), a total of 471 respondents were eligible for the current study. Of those 72 respondents failed to answer the question on community tolerance; and the remaining 399 (85%) were included in the analyses. Among those, 24% (n=96) agreed or strongly agreed that most people in their area were tolerant of transgender individuals. The average age of study participants was 48 years (median 49 years) with a range from 18 to 81 years. The majority of study participants (70%) were trans-women; 85% were Non-Hispanic Whites, and more than half (57%) completed college. Persons from a tolerant area included a greater proportion of persons over the age of 50 years (58%) than those who came from an area not perceived as tolerant towards transgender individuals (46%). The two groups were not significantly different with respect to gender identity, race/ethnicity, education, relationship status, past experience with abuse and discrimination, or gender confirmation treatment categories (Table 1).

Table 2 summarizes results of the multivariable regression models that used a BDI-PC score 4–21 (vs. 0–3) and a CESD-10 score of 10–30 (vs. 0–9) as the binary outcomes of interest. None of the interaction terms was statistically significant. In the BDI-PC analyses, after adjusting for age, gender identity, race/ethnicity, education, relationship status and treatment category, the prevalence of depression (score ≥4) was three times lower among persons from a tolerant area than among persons who did not perceive their area as tolerant (aPR=0.33; 95% CI: 0.08–0.32). When CESD-10 score of ≥10 was used as the outcome of interest, the aPR comparing persons who did and did not report their area as tolerant was 0.66 with a 95% CI from 0.49 to 0.89. Another factor consistently and statistically significantly associated with a lower probability of depressive symptoms was having a college education with aPRs of 0.75 for BDI-PC and 0.79 for CESD-10.

Individuals who experienced at least two aspects of abuse or discrimination in the previous 12 months were 40% to 60% more likely to have depressive symptoms than those who reported no such experience. There was an approximately 1.5-fold increase in prevalence of depression among transgender individuals who were not receiving, but wanted to receive, hormonal therapy relative to those who were not treated and did not plan to be treated with hormones. The corresponding association for current hormonal therapy was less pronounced and was statistically significant only for CESD-10, but not for BDI-PC. None of the results for surgical gender confirmation categories were statistically significantly different from the null values. Neither BDI-PC nor CESD-10 analysis results demonstrated discernable associations with gender identity, age, race/ethnicity, or relationship status.

DISCUSSION

Depression was very common among participants in this study: approximately 40% of participants had a BDI-PC score consistent with MDD, and 50% met the definition of significant depressive symptoms based on CESD-10. These prevalence estimates are within the range of 28% to 66% reported in other studies of depression among transgender individuals (Bockting, Miner, Swinburne Romine, Hamilton, & Coleman, 2013; Budge, Adelson, & Howard, 2013; Nemoto, Bodeker, & Iwamoto, 2011; Nuttbrock et al., 2014; Reisner, White, Mayer, & Mimiaga, 2014). These figures are much higher than the prevalence estimates of 4.1% for current major depression and 9.1% for any current depression reported in the general population of the United States (Do et al., 2014).

Our data indicate that transgender individuals who reported coming from a tolerant area had significantly lower prevalence of depression regardless of the depressive symptoms scale. Although we are not aware of other studies addressing the specific issue of community tolerance towards transgender individuals, our results are in keeping with research evidence obtained in other community settings. For example, a prospective study in Baltimore found a strong association between negative perceived neighborhood characteristics including social support and subsequent depressive symptoms, even after adjusting for baseline depression levels (Latkin & Curry, 2003). Similarly, in a survey of mothers living in Nottingham, UK, lack of social support was associated with depression, even after controlling for individual-level characteristics (Mulvaney & Kendrick, 2005).

Other important determinants of the high and disproportionate rate of depression among members of the transgender community include history of abuse and discrimination. Prior studies reported that transgender individuals are at increased risk for physical abuse (Lombardi et al., 2001; Stotzer, 2008), which has also been linked to depression and suicide. A recent longitudinal study of transgender women in the New York City metropolitan area found that gender abuse was associated with major depression (Nuttbrock et al., 2014). Data from another study of transgender individuals in Virginia show that, among both trans women and trans men, those who had experienced either physical and/or sexual violence were significantly more likely to report a history of suicide attempts compared to those who had not had these experiences (Testa et al., 2012). The association between abuse and depression has been similarly reported in non-transgender populations. For example, a recent meta-analysis suggested two to three-fold increased risk of major depressive disorder and 1.5–2-fold increased risk of elevated depressive symptoms among women exposed to intimate partner violence relative to non-exposed women (Beydoun, Beydoun, Kaufman, Lo, & Zonderman, 2012).

Transgender individuals are also at an increased risk for psychological abuse. For example, Nuttbrock and colleagues report that 53.0% of their study participants had experienced verbal abuse or harassment in the past 6 months at baseline with a yearly incidence during the follow-up period of 40.8% (Nuttbrock et al., 2014). Transgender individuals also report experiencing high rates of discrimination across multiple areas including health care, employment and housing. In one study, 26% of participants indicated that they had been denied medical care because they were transgender and over half reported difficulty accessing health services in the past year (Kenagy, 2005). Employment- and housing-related discrimination is also commonly reported. Results from a San Francisco study indicated that, among trans-women, almost half reported experiencing employment discrimination and 27% reported experiencing housing discrimination; among female-to-male transgender participants, over half reported employment discrimination and 20% reported housing discrimination (Clements, Katz, & Marx, 1999). Nearly half the individuals in the present study reported experiencing two or more aspects of abuse or discrimination and they were more likely to have depressive symptoms compared to those who had no such experiences.

Our results also indicate that higher education is associated with a lower prevalence of depression among transgender and gender non-conforming individuals. In general, previous data drawn from a national probability sample of U.S. households suggest that educated individuals are more likely to be employed, and tend to have higher incomes. Thus, they have more access to social psychological resources and are less likely to experience hardship that can lead to depression and hopelessness (Ross & Wu, 1995).

We found that depression was most common among transgender individuals who were not receiving, but wanted to receive, hormonal therapy relative to those who were neither being treated nor planned to be treated with hormones. This finding is consistent with data from the Trans PULSE study which found that female-to-male transgender individuals who were planning to medically transition (with hormones and/or surgery) but had not begun were 5 times more likely to be depressed compared with those had already transitioned (Rotondi et al., 2011). We also found that participants who reported currently receiving hormonal

treatment were more likely to experience depression than those who expressed no desire to be treated with hormones, but this difference was not as pronounced. In a study of transwomen conducted by Nuttbrock and colleagues, receipt of hormone therapy predicted psychological and physical gender abuse, which, in turn, predicted depression. The authors hypothesized that participants' expression of gender identity via hormonal therapy may increase their exposure to gender abuse and, ultimately, depression (Nuttbrock et al., 2014). The results for BDI-PC which are aimed to detect clinical depression (Skorikov & Vandervoort, 2003) demonstrated no statistically difference between person not seeking hormonal therapy and those who are receiving hormones. It is important to keep in mind that the cross-sectional nature of the analyses did not allow assessing effectiveness of gender confirmation therapy in reducing depression, which would require longitudinal data collection with evaluation of depression symptoms before and after treatment initiation.

The cross-sectional design of the study also raises a concern that individuals who are depressed may be more likely to perceive their community as intolerant. There is some evidence from a recent study among female college students that depressive symptoms may lead to increased perceptions (and therefore reporting) of discrimination (Sechrist, Swim, & Mark, 2003). However, a recent longitudinal study of African American adolescents found that experienced racial discrimination was positively associated with incident depressive symptoms, thereby supporting the role of experienced discrimination in the etiology of depression (English, Lambert, & Ialongo, 2014).

Another limitation of the present study is that participants were recruited from a single social network, and therefore were different from the general population of transgender individuals. The relatively high level of education, and the predominance of Non-Hispanic Whites and trans-women raise concerns about the generalizability of our findings. Given that the racial/ethnic minority transgender individuals are more likely to experience both enacted and perceived stigma compared with Caucasian transgender individuals (Bockting et al., 2013), increased diversity is needed in future research on this topic. As the sample size was relatively small we had to dichotomize some of the variables during analysis. A larger sample size would have enabled us to divide some of the independent variables, such as race or education, into multiple categories. Similarly, a large sample size would have allowed performing ordinal logistic regression analyses in which the dependent variable (BDI-PC or CESD-10 score) is subdivided into three or more categories.

In spite of these limitations, this study has a number of important strengths. First, most studies of transgender individuals have been conducted in clinical settings and therefore were not designed to include persons who are not receiving gender confirmation therapy (Gomez-Gil et al., 2012; Gorin-Lazard et al., 2013; Wierckx et al., 2011). The present study was conducted in a non-clinical setting and asked participants about both desired and received treatment and thus may be better able to capture the range of gender confirmation therapy patterns in this population. We also utilized two measures of depression – the Beck Depression Inventory and the Center for Epidemiologic Studies Depression Scale to test the robustness of findings across outcome assessment instruments. The consistently observed associations of several factors with depressive symptoms regardless of the scale provide additional support for the validity of our findings.

CONCLUSION

In conclusion, depression was common in this sample of transgender and gender non-conforming individuals and was strongly and consistently associated with participants' perceptions of community tolerance, even after adjusting for possible confounding variables including actual past experiences with abuse or discrimination. The association between desire to receive hormonal therapy and depression is a finding that warrants further exploration. Future research should also assess depression and changes in perception of community tolerance in transgender individuals before and after initiation of gender confirmation treatment.

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References

Andresen EM, Malmgren JA, Carter WB, Patrick DL. Screening for depression in well older adults: evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). Am J Prev Med. 1994; 10(2):77–84. [PubMed: 8037935]

Bazargan M, Galvan F. Perceived discrimination and depression among low-income Latina male-to-female transgender women. BMC Public Health. 2012; 12:663–663. DOI: 10.1186/1471-2458-12-663 [PubMed: 22894701]

Beydoun HA, Beydoun MA, Kaufman JS, Lo B, Zonderman AB. Intimate partner violence against adult women and its association with major depressive disorder, depressive symptoms and postpartum depression: a systematic review and meta-analysis. Soc Sci Med. 2012; 75(6):959–975. DOI: 10.1016/j.socscimed.2012.04.025 [PubMed: 22694991]

Bisschop MI, Kriegsman DM, Deeg DJ, Beekman AT, van Tilburg W. The longitudinal relation between chronic diseases and depression in older persons in the community: the Longitudinal Aging Study Amsterdam. J Clin Epidemiol. 2004; 57(2):187–194. DOI: 10.1016/j.jclinepi.2003.01.001 [PubMed: 15125629]

Blosnich JR, Brown GR, Shipherd JC Phd, Kauth M, Piegari RI, Bossarte RM. Prevalence of gender identity disorder and suicide risk among transgender veterans utilizing veterans health administration care. Am J Public Health. 2013; 103(10):e27–32. DOI: 10.2105/AJPH.2013.301507

Bockting WO, Miner MH, Swinburne Romine RE, Hamilton A, Coleman E. Stigma, mental health, and resilience in an online sample of the US transgender population. Am J Public Health. 2013; 103(5):943–951. DOI: 10.2105/AJPH.2013.301241 [PubMed: 23488522]

Bockting WO, Robinson BE, Rosser BR. Transgender HIV prevention: a qualitative needs assessment. AIDS care. 1998; 10(4):505–525. [PubMed: 9828969]

Budge SL, Adelson JL, Howard KA. Anxiety and depression in transgender individuals: the roles of transition status, loss, social support, and coping. J Consult Clin Psychol. 2013; 81(3):545–557. DOI: 10.1037/a0031774 [PubMed: 23398495]

Clements-Nolle K, Marx R, Katz M. Attempted suicide among transgender persons: The influence of gender-based discrimination and victimization. J Homosex. 2006; 51(3):53–69. DOI: 10.1300/J082v51n03_04 [PubMed: 17135115]

Clements, K., Katz, M., Marx, R. The Transgender Community Health Project: Descriptive Results. San Francisco, CA: San Francisco Department of Public Health; 1999.

Do AN, Rosenberg ES, Sullivan PS, Beer L, Strine TW, Schulden JD, … Skarbinski J. Excess burden of depression among HIV-infected persons receiving medical care in the united states: data from the medical monitoring project and the behavioral risk factor surveillance system. PloS one. 2014; 9(3):e92842.doi: 10.1371/journal.pone.0092842 [PubMed: 24663122]

English D, Lambert SF, Ialongo NS. Longitudinal associations between experienced racial discrimination and depressive symptoms in African American adolescents. Dev Psychol. 2014; 50(4):1190–1196. [PubMed: 24188037]

Gomez-Gil E, Zubiaurre-Elorza L, Esteva I, Guillamon A, Godas T, Cruz Almaraz M, … Salamero M. Hormone-treated transsexuals report less social distress, anxiety and depression. Psychoneuroendocrinology. 2012; 37(5):662–670. DOI: 10.1016/j.psyneuen.2011.08.010 [PubMed: 21937168]

Gorin-Lazard A, Baumstarck K, Boyer L, Maquigneau A, Gebleux S, Penochet JC, … Bonierbale M. Is hormonal therapy associated with better quality of life in transsexuals? A cross-sectional study. J Sex Med. 2012; 9(2):531–541. DOI: 10.1111/j.1743-6109.2011.02564.x [PubMed: 22145968]

Gorin-Lazard A, Baumstarck K, Boyer L, Maquigneau A, Penochet JC, Pringuey D, … Auquier P. Hormonal therapy is associated with better self-esteem, mood, and quality of life in transsexuals. J Nerv Ment Dis. 2013; 201(11):996–1000. DOI: 10.1097/NMD.0000000000000046 [PubMed: 24177489]

Grossman AH, D'Augelli AR. Transgender youth and life-threatening behaviors. Suicide Life Threat Behav. 2007; 37(5):527–537. DOI: 10.1521/suli.2007.37.5.527 [PubMed: 17967119]

Han B. Depressive symptoms and self-rated health in community-dwelling older adults: a longitudinal study. J Am Geriatr Soc. 2002; 50(9):1549–1556. [PubMed: 12383153]

Hoffman B. An overview of depression among transgender women. Depress Res Treat. 2014 e-pub ahead of print.

Institute of Medicine. The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding. Washington, DC: The National Academies Press; 2011.

Kenagy GP. Transgender health: findings from two needs assessment studies in Philadelphia. Health Soc Work. 2005; 30(1):19–26. [PubMed: 15847234]

Kessler RC, Akiskal HS, Ames M, Birnbaum H, Greenberg P, Hirschfeld RM, … Wang PS. Prevalence and effects of mood disorders on work performance in a nationally representative sample of U.S. workers. Am J Psychiatry. 2006; 163(9):1561–1568. DOI: 10.1176/appi.ajp.163.9.1561 [PubMed: 16946181]

Latkin CA, Curry AD. Stressful neighborhoods and depression: a prospective study of the impact of neighborhood disorder. J Health Soc Behav. 2003; 44(1):34–44. [PubMed: 12751309]

Lombardi EL, Wilchins RA, Priesing D, Malouf D. Gender violence: transgender experiences with violence and discrimination. J Homosex. 2001; 42(1):89–101. [PubMed: 11991568]

Mulvaney C, Kendrick D. Depressive symptoms in mothers of pre-school children--effects of deprivation, social support, stress and neighbourhood social capital. Soc Psychiatry Psychiatr Epidemiol. 2005; 40(3):202–208. DOI: 10.1007/s00127-005-0859-4 [PubMed: 15742225]

Nemoto T, Bodeker B, Iwamoto M. Social support, exposure to violence and transphobia, and correlates of depression among male-to-female transgender women with a history of sex work. Am J Public Health. 2011; 101(10):1980–1988. DOI: 10.2105/AJPH.2010.197285 [PubMed: 21493940]

Nemoto T, Sausa LA, Operario D, Keatley J. Need for HIV/AIDS education and intervention for MTF transgenders: responding to the challenge. J Homosex. 2006; 51(1):183–202. DOI: 10.1300/J082v51n01_09

Nuttbrock L, Bockting W, Rosenblum A, Hwahng S, Mason M, Macri M, Becker J. Gender abuse, depressive symptoms, and HIV and other sexually transmitted infections among male-to-female transgender persons: a three-year prospective study. Am J Public Health. 2013; 103(2):300–307. DOI: 10.2105/AJPH.2011.300568 [PubMed: 22698023]

Nuttbrock L, Bockting W, Rosenblum A, Hwahng S, Mason M, Macri M, Becker J. Gender abuse and major depression among transgender women: a prospective study of vulnerability and resilience. Am J Public Health. 2014; 104(11):2191–2198. DOI: 10.2105/AJPH.2013.301545 [PubMed: 24328655]

Patten SB. An analysis of data from two general health surveys found that increased incidence and duration contributed to elevated prevalence of major depression in persons with chronic medical conditions. J Clin Epidemiol. 2005; 58(2):184–189. DOI: 10.1016/j.jclinepi.2004.06.006 [PubMed: 15680753]

Reilly KH, Neaigus A, Jenness SM, Wendel T, Marshall DMt, Hagan H. Experiences of Discrimination and HIV Risk Among Men Who Have Sex With Men in New York City. Am J Mens Health. 2015; doi: 10.1177/1557988315575998

Reisner SL, White JM, Mayer KH, Mimiaga MJ. Sexual risk behaviors and psychosocial health concerns of female-to-male transgender men screening for STDs at an urban community health center. AIDS care. 2014; 26(7):857–864. DOI: 10.1080/09540121.2013.855701 [PubMed: 24206043]

Ross CE, Wu CL. The links between education and health. Am Soc Rev. 1995; 60(5):719–745. DOI: 10.2307/2096319

Rotondi NK, Bauer GR, Scanlon K, Kaay M, Travers R, Travers A. Prevalence of and risk and protective factors for depression in female-to-male transgender Ontarians: Trans PULSE project. Canadian Journal of Community Mental Health. 2011; 30(2):135–155.

Sechrist GB, Swim JK, Mark MM. Mood as information in making attributions to discrimination. Pers Soc Psychol Bull. 2003; 29(4):524–531. DOI: 10.1177/0146167202250922 [PubMed: 15273005]

Skorikov VB, Vandervoort DJ. Relationships between the underlying constructs of the Beck Depression Inventory and the Center for Epidemiological Studies Depression Scale. Educational and Psychological Measurement. 2003; 63(2):319–335.

Steer RA, Cavalieri TA, Leonard DM, Beck AT. Use of the Beck Depression Inventory for Primary Care to screen for major depression disorders. Gen Hosp Psychiatry. 1999; 21(2):106–111. [PubMed: 10228890]

Stotzer RL. Gender identity and hate crimes: Violence against transgender people in Los Angeles County. Sex Res Soc Policy. 2008; 5(1):43–52.

Testa RJ, Sciacca LM, Wang F, Hendricks ML, Goldblum P, Bradford J, Bongar B. Effects of violence on transgender people. Prof Psych Res Practice. 2012; 43(5):452–459. DOI: 10.1037/A0029604

Wierckx K, Van Caenegem E, Elaut E, Dedecker D, Van de Peer F, Toye K, … T'Sjoen G. Quality of life and sexual health after sex reassignment surgery in transsexual men. J Sex Med. 2011; 8(12): 3379–3388. DOI: 10.1111/j.1743-6109.2011.02348.x [PubMed: 21699661]

Yi MS, Mrus JM, Wade TJ, Ho ML, Hornung RW, Cotton S, … Tsevat J. Religion, spirituality, and depressive symptoms in patients with HIV/AIDS. J Gen Intern Med. 2006; 21(Suppl 5):S21–27. DOI: 10.1111/j.1525-1497.2006.00643.x

Table 1

Demographic, personal, treatment and depression related characteristics of participants

Variables	Total population N=399		From a tolerant area? No (N=303)		Yes (N=96)		p-value[b]
	N	%	N	%	N	%	
Age							
<40 years	105	26%	88	29%	17	18%	0.05
40–49 years	100	25%	77	25%	23	24%	
50+ years	194	49%	138	46%	56	58%	
Gender identity							
Trans-women	278	70%	211	70%	67	70%	0.60
Trans-men	103	26%	80	26%	23	24%	
Other	18	4%	12	4%	6	6%	
Race/ethnicity							
Non-Hispanic White	340	85%	258	85%	82	85%	0.95
Other/mixed/undeclared	59	15%	45	15%	14	15%	
College education							
No	170	43%	133	44%	37	39%	0.17
Yes	229	57%	170	56%	59	61%	
Relationship status[a]							
Single	167	42%	133	44%	34	35%	0.32
Married/in civil union	151	38%	111	37%	40	42%	
In other committed partnership	80	20%	58	19%	22	23%	
Hormonal treatment status							
Not receiving and not planning	191	48%	139	46%	52	54%	0.24
Not receiving but planning	79	20%	65	21%	14	15%	
Currently receiving	129	32%	99	33%	30	31%	
Surgical treatment status							
Never had and not planning	230	58%	167	55%	63	66%	0.08
Never had but planning	142	35%	117	39%	25	26%	
Underwent	27	7%	19	6%	8	8%	

Variables	Total population N=399		From a tolerant area? No (N=303)		Yes (N=96)		p-value[b]
	N	%	N	%	N	%	
Past experience with abuse or discrimination							
None	214	53%	157	52%	57	59%	0.28
One aspect	82	21%	62	20%	20	21%	
Two or more aspects	103	26%	84	28%	19	20%	
Total BDI-PC score							
no MDD (0–3 pts.)	229	59%	152	51%	77	86%	<0.001
MDD (4–21 pts.)	158	41%	145	49%	13	14%	
Total CESD-10 score							
No or mild depression symptoms (0–9 pts.)	184	50%	123	44%	61	68%	<0.001
Significant depression symptoms (10–30 pts.)	184	50%	155	56%	29	32%	

[a] Excludes one person whose relationship status is not reported

[b] Based on chi-square tests

Table 2

Multivariable analyses of factors associated with MDD (BDI-PC) or significant depression symptoms (CESD-10): both models include each of the variables listed below

Variables	BDI-PC: 4–21 vs. 0–3 pts.				CESD-10: 10–30 vs. 0–9 pts.			
	aPR[a]	95% CI[a]		p-value[a]	aPR[a]	95% CI[a]		p-value[a]
Gender identity								
Trans-women	1	(reference)			**1**	(reference)		
Trans-men	0.84	0.60	1.16	0.26	0.98	0.76	1.27	0.88
Other	1.19	0.76	1.86	0.49	0.95	0.57	1.59	0.86
Age								
<40 years	1	(reference)			1	(reference)		
40–49 years	1.33	0.98	1.82	0.07	1.13	0.87	1.46	0.37
50+ years	1.06	0.77	1.46	0.71	0.92	0.72	1.22	0.64
Race/ethnicity								
Non-Hispanic White	1	(reference)			1	(reference)		
Other/mixed/undeclared	1.17	0.87	1.56	0.32	1.11	0.87	1.46	0.43
Education								
No college degree	1	(reference)			1	(reference)		
College degree or more	**0.75**	**0.60**	**0.95**	**0.01**	**0.79**	**0.65**	**0.96**	**0.02**
Relationship status								
Single	1	(reference)			1	(reference)		
Not single[b]	1.16	0.91	1.47	0.21	0.93	0.76	1.14	0.46
Hormonal treatment status								
Not receiving and not planning	1	(reference)			1	(reference)		
Not receiving but planning	**1.53**	**1.04**	**2.26**	**0.04**	**1.54**	**1.05**	**2.25**	**0.02**
Currently receiving	1.29	0.82	2.04	0.26	**1.47**	**1.01**	**2.14**	**0.05**
Surgical treatment status								
Never had and not planning	1	(reference)			1	(reference)		
Never had but planning	1.14	0.78	1.66	0.50	1.05	0.76	1.46	0.75
Underwent	0.77	0.40	1.50	0.45	0.65	0.34	1.24	0.17
Experience of abuse or discrimination								

Variables	BDI-PC: 4–21 vs. 0–3 pts.				CESD-10: 10–30 vs. 0–9 pts.			
	aPR[a]	95% CI[a]		p-value[a]	aPR[a]	95% CI[a]		p-value[a]
None	1	(reference)			1	(reference)		
One aspect	0.92	0.65	1.29	0.61	1.10	0.84	1.45	0.48
Two or more aspects	**1.61**	**1.27**	**2.04**	**<0.01**	**1.38**	**1.11**	**1.71**	**0.01**
From a tolerant area								
No	1	(reference)			1	(reference)		
Yes	**0.33**	**0.20**	**0.54**	**<0.01**	**0.66**	**0.49**	**0.89**	**<0.01**

[a] Bold print indicates statistically significant results

[b] Includes persons who are married, or in civil union or other committed relationship