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Sexual orientation differences in functional limitations, disability, and mental health services use: Results from the 2013–2014 National Health Interview Survey

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Abstract

Objectives—We investigated sexual orientation differences in risk for mental health morbidity, functional limitations/disability, and mental health services use among adults interviewed in the nationally representative 2013–2014 National Health Interview Survey (NHIS).

Method—Respondents were 68,816 adults ($n=67,152$ heterosexual and $n=1,664$ lesbian, gay, and bisexual (LGB) individuals), age 18 and older. Fully structured interviews assessed sexual orientation identity, health status, and services use. Using sex-stratified analyses while adjusting for demographic confounding, we compared LGB and heterosexual individuals for evidence of mental health-related impairments and use of mental health services.

Results—LGB adults, as compared to heterosexual adults, demonstrated higher prevalences of mental health morbidity and functional limitations. However, this varied by gender with LGB women evidencing elevated risk for both mental health and substance abuse (MHSA) and non-MHSA limitations. Among men, sexual orientation differences clustered among MHSA-related limitations. Overall, LGB adults were more likely than heterosexual adults to use services, with the source of functional limitations moderating these effects among men.

Conclusion—MHSA-related morbidity is a significant concern among LGB individuals and is associated with higher levels of functional limitations/disability. Our findings highlight that LGB persons use MHSA-related treatment at higher rates than heterosexuals do, and, among men, are more likely to do so absent MHSA or non-MHSA-related functional limitations. This presents a unique set of concerns within the integrated care setting, including the need to deliver culturally competent care sensitive to the context of probable sex differences among LGB individuals.

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Keywords

functional limitations; disability; gay, lesbian, and bisexual; mental health

While recent changes in public opinion suggest that social stigmatization of homosexuality may be waning (Schwadel & Garneau, 2014), day-to-day discrimination remains a chronic stressor in the lives of many lesbian, gay, and bisexual (LGB) individuals (Feinstein, Goldfried, & Davila, 2012). Reflecting this, comparative studies of LGB and heterosexual individuals repeatedly document elevated prevalence of current psychological distress, suicide attempts, major depression, generalized anxiety disorder, and other mental health/substance abuse disorders among LGB women and men (Bostwick, Boyd, Hughes, & McCabe, 2010; Cochran & Mays, 2013; Cohen, Blasey, Taylor, Weiss, & Newman, 2016; Gevonden et al., 2014; Mays & Cochran, 2001; Pachankis, Cochran, & Mays, 2015). Whether these differences also translate into higher rates of functional limitations and enduring disabilities is not entirely clear (Austin, Herrick, & Proescholdbell, 2016; Björkenstam et al., 2016; Boehmer, Miao, Linkletter, & Clark, 2014; Cochran & Mays, 2007; Fredriksen-Goldsen, Kim, Barkan, Muraco, & Hoy-Ellis, 2013; Gonzales & Henning-Smith, 2015; Siordia, 2015). By functional limitations, we refer to restricted abilities to perform basic tasks (such as the ability to walk, run, or remember with or without use of special equipment) whether or not the individual seeks to utilize those abilities (Verbrugge & Jette, 1994). Functional limitations have the effect of reducing an individual's capability to participate fully in daily life. In contrast, disability refers to limitations due to health-related causes in actual performance of complex behaviors and social roles, such as engaging in personal self-care (activities of daily living, ADL), accomplishing household management tasks (instrumental activities of daily living, IADL), or, if of working age, working for gainful employment. Disability is seen as the gap between the demands of the environment and the capabilities of the individual (Verbrugge & Jette, 1994).

The current study capitalizes on the recent inclusion of sexual orientation measurement in the National Health Interview Survey (NHIS) to investigate patterns of functional limitations and disability in this potentially vulnerable population. Our work is guided by two complementary psychosocial models. The Minority Stress Model (MSM) (Meyer, 2003) conceptualizes that socially marginalized identities, such as identifying as LGB, increase the risk of exposure to minority stressors, including sexual prejudice (Herek & McLemore, 2013) and discrimination. These external threats are then seen as fostering chronic hypervigilance for anticipated discrimination, internalization of negative attitudes about one's self or one's sexual orientation, and resulting impairments in mental well-being. To cope with minority stress, LGB individuals recruit a variety of both individual and social resources, including developing a positive gay identity, acquiring resiliency skills, and creating supportive communities (Meyer, 2013). Further, we would argue that seeking counseling or psychological services to manage anti-gay stigma or coming out concerns is consistent with a minority stress coping response (Cochran et al., 2014; Pachankis, Hatzenbuehler, Rendina, Safren, & Parsons, 2015). Over the years, the MSM has received substantial empirical support, particularly when predicting sexual orientation-related disparities in mental health morbidity (Cochran, 2001; Cochran & Mays, 2009; Eldahan et

al., 2016; Feinstein et al., 2012; Hatzenbuehler, 2009; Lehavot & Simoni, 2011; McCabe, Bostwick, Hughes, West, & Boyd, 2010; Meyer, 2003; Meyer, Schwartz, & Frost, 2008; Pachankis, Rendina, et al., 2015; Ueno, 2010). However, the MSM is less robust at explaining frequently observed patterns of gender (Cochran, Bandiera, & Mays, 2013; Cochran & Mays, 2013) or racial/ethnic (Bostwick, Boyd, Hughes, West, & McCabe, 2014; Bostwick, Meyer, et al., 2014; Calabrese, Meyer, Overstreet, Haile, & Hansen, 2015) differences within the LGB population. For example, although the MSM predicts that the double marginalization of sexual and racial/ethnic minority status should result in greater mental health disparities among LGB persons of color, current evidence is not fully supportive of this prediction (Bostwick, Meyer, et al., 2014; Calabrese et al., 2015; Cochran, Mays, Alegria, Ortega, & Takeuchi, 2007).

Thus our approach also incorporates notions drawn from the Cumulative Advantage/Disadvantage hypothesis (CAD) (Dannefer, 2003; DiPrete & Eirich, 2006). CAD refers to a systematic process whereby the effects of social advantages and disadvantages occurring earlier in life have an increasingly larger impact on individuals over the life course. These advantages arise from differences in social roles, statuses, and available resources, accumulating over time to create diversities of outcomes among individuals, even between those who might share currently similar social profiles. The integration of CAD processes brings an intersectionality approach (Dannefer, 2003) to conceptualize how differences in the life course might create diversities of outcomes within the LGB population. For example, LGB persons are less likely than heterosexual individuals to live with a relationship partner or to raise children (Carpenter & Gates, 2008). In later adulthood, single LGB individuals would then differ from single heterosexual adults in the structures of their social support networks. CAD also predicts that the impact of minority stress might vary between LGB persons of different gender, race/ethnicity, or individual backgrounds. In this regard, early mental health advantages of resiliency seen among some racial/ethnic minorities (Breslau, Kendler, Su, Gaxiola-Aguilar, & Kessler, 2005) might be protective for LGB persons of color, reducing some of the harmful impact of minority stress due to multiple disadvantaged statuses (Cochran et al., 2007).

To date, comparisons of the burden of functional limitations and disabilities between LGB and heterosexual individuals suggest that disability prevalence may be greater among LGB persons. Studies have found that LGB individuals, especially women, are more likely than heterosexual women and men to report a health disability (Austin et al., 2016; Boehmer et al., 2014; Cochran & Mays, 2007; Fredriksen-Goldsen et al., 2013; Frisch & Simonsen, 2013; Hsieh & Ruther, 2016). However, these studies did not assess the nature or extent of that disability. Additional research has compared individuals in same-sex (SS) couples to individuals in different-sex (DS) couples finding that rates of disability and receiving disability pensions are somewhat higher among persons in SS couples (Björkenstam et al., 2016; Siordia, 2015). Across existing studies, however, the extent to which mental health vulnerabilities, possibly linked to minority stress (Meyer, 2003) or CAD processes (DiPrete & Eirich, 2006), contribute to these differences is generally unknown. Gonzales and Henning-Smith (Gonzales & Henning-Smith, 2015) did investigate mental health limitations and deficits in ADLs among coupled individuals, age 50 and older; they found that both SS coupled women and men were more psychologically distressed than DS coupled women and

men, but only SS coupled women experienced excess burden for ADL deficits. Finally, for sexual minority men, HIV infection may be an important source of either disability or disabled status given the prevalence of HIV infection among gay and bisexual (GB) men, currently estimated at nearly 1 in 5 men (Xu, Sternberg, & Markowitz, 2010).

In the current study, we tackle three key questions. First, do LGB persons experience elevated rates of functional impairment and/or disability in everyday living? While earlier work suggests that this may be so (Austin et al., 2016; Björkenstam et al., 2016; Boehmer et al., 2014; Cochran & Mays, 2007; Fredriksen-Goldsen et al., 2013; Gonzales & Henning-Smith, 2015; Siordia, 2015), we take advantage of the extensive measurement of functional limitations and disability in the NHIS to obtain a more nuanced characterization of possible sexual orientation-linked differences that exist in the general population. For example, the effects of social marginalization associated with sexual orientation might have stronger effects on complex disabilities, such as the ability to work, or those related to social contact, but little impact on basic abilities such as ambulation.

Second, if differences do exist between sexual minority and heterosexual adults, are these differences driven primarily by mental health morbidity, reflecting the well-documented mental health disparities linked to sexual orientation status? The NHIS offers a unique opportunity to investigate this question as it includes measures of both self-reported mental and physical current health status as well as whether mental health-related symptoms and/or disorders are contributory to evident functional limitations. Because previous research has shown that mental health distress and disorders are both risk factors for and comorbid consequences of functional limitations and disability (Caputo & Simon, 2013; Shrira & Litwin, 2014), the cross-sectional design of the NHIS precludes testing causal hypotheses. However, it is possible to investigate whether sexual orientation-linked differences in functional limitations and disability are primarily clustered in the realm of mental health-linked impairments. This would be consistent with minority stress conceptualizations that emphasize the chronic nature of social marginalization in eroding one's sense of well-being (Meyer, 2003; Meyer et al., 2008). However, there may be additional factors that influence sexual orientation-related disparities in functional limitations. Rates of tobacco use, for example, are generally higher within the LGB population when compared to heterosexual populations (Cochran et al., 2013; Corliss et al., 2013) and tobacco use is strongly linked to higher rates of functional limitations and disability (Lim et al., 2012). Thus it is possible that the nature of functional limitations and disability among LGB adults may reflect both the effects predicted by the MSM and behavioral risk differences among individuals of different sexual orientations.

Third, are there sexual orientation-related differences in patterns of mental health services utilization among those with or without functional limitations, particularly limitations attributable to mental health-related causes? While the extant research literature indicates that LGB persons are more likely to report using mental health services (Cochran, Mays, & Sullivan, 2003), characterization of who uses services, why, or the types of services utilized by this population is less well understood (Flentje, Livingston, Roley, & Sorensen, 2015; Grella, Cochran, Greenwell, & Mays, 2011; Grella, Greenwell, Mays, & Cochran, 2009; McCabe, West, Hughes, & Boyd, 2013; Meyer, 2015). Some types of mental health services,

especially counseling or psychotherapy, may be used by sexual minority individuals to aid in developing resiliency skills or to manage coming out issues (Pachankis, Hatzenbuehler, et al., 2015) leading to greater use of counseling or psychotherapy. However other interventions, such as psychopharmaceutic treatments, might not evidence sexual orientation-related use differences. To date, research on mental health services use among LGB individuals has not generally differentiated between the two types of care, nor attempted to characterize patterns of use differences that might be associated with sexual orientation. Whether the greater propensity to seek care is merely a consequence of sexual orientation-related differences in mental health morbidity or reflects distinct preferences for types of services is unknown.

Our overall goal, then, is to characterize the mental health needs of LGB persons in the United States, particularly among those with functional limitations and disability. This may assist clinicians in developing interventions within the integrated care setting to most effectively address the needs of LGB women and men who seek mental health services (Lyons, Bieschke, Dendy, Worthington, & Georgemiller, 2010).

Method

Participants and Procedure

We used publicly available data from two years of the National Health Interview Survey (2013–2014 NHIS) (National Center for Health Statistics, 2014, 2015). This federal dataset is collected via a complex, multistage sampling design from nearly 40,000 households selected annually. In each survey year, following approved internal review board protocols, the NHIS obtains information on approximately 100,000 persons living within these households; the annual sample is representative of the civilian non-institutionalized population in the United States. The interview process itself uses extensively trained interviewers who initially enumerate all persons and families within selected households by interviewing a household referent adult. For each family identified, a family referent adult (69% of whom are also the household referent adult) is then selected to complete a structured interview that assesses the health status of each family member including measures of functional disability. Next, one adult from each family is randomly selected to complete a more extensive health interview; all responses are self-reported. In the two, independent survey years (2013–2014), household response rates for initial screening averaged 75%; conditional response rates for the sampled adult interview averaged 81%. Beginning in the 2013 survey year, the NHIS added a single question to the sampled adult interview assessing sexual orientation identity. Across the 2013–2014 surveys, 71,254 adults, aged 18 years and older, completed the sampled adult interview. Of these, 69,718 were administered the sexual orientation question with 68,816 providing usable responses. These individuals, referred to henceforth as respondents, comprise the study sample. Due to the public nature of the NHIS dataset, the current study was exempt from further IRB review requirements.

Measures

Sexual Orientation—Respondents were asked “Which of the following best represents how you think of yourself?” Four answers were offered: 1) *Lesbian or gay* for women and *Gay* for men; 2) *Straight, that is, not lesbian or gay*; 3) *Bisexual*; or 4) *Something else*. Persons selecting *Something else* ($n = 144$) provided no further information and were dropped from the sample. We also excluded those who refused to respond ($n = 448$) or indicated they did not know how to answer the question ($n = 310$). For the remaining respondents, we categorized sexual orientation into two groups: those identifying as heterosexual ($n = 67,152$) or as sexual minority ($n = 1,664$), including 1,149 who identified as lesbian or gay and 515 as bisexual.

Functional limitations and disability—The NHIS extensively measured functional limitations (Brandt, Ho, Chan, & Rasch, 2014). This was done both in the family interview, conducted with the family referent adult (71% of whom were also the sampled adult respondent) and in the sampled adult interview. In the family interview, the referent was asked if the sampled adult (respondent) currently experienced limitations or difficulties in functioning in any of several domains due to “a physical, mental or emotional problem.” The functional domains assessed were: walking; remembering things; activities of daily living (ADL) such as bathing, dressing, or getting around; and instrumental activities of daily living (IADL) such as doing household chores or shopping. Respondents with one or more areas of reported functional difficulty were classified by NHIS as having a general functional activity limitation. A subsequent question asked what medical conditions or health problems caused these limitations. NHIS coded open-ended responses into one of 37 health conditions including three mental health/substance abuse-related (MHSA) causes: depression, anxiety, or emotional problems (corresponding to ICD-9 CM Codes: 300.0–302.9, 306–313.9); alcohol, drugs, or substance use (ICD-9 CM codes: 291–292.9, 303–305.9); and any other mental disorder (ICD-9 CM codes: 290–290.9, 293–299.9, 314.00, 314.01). We further classified general functional activity limitations into one of two types: those in which MHSA-related conditions were contributory and those in which MHSA-related conditions were absent. In addition, the family referent adult rated the respondent’s current general health status. This we collapsed into one of two categories (*Excellent, Very good, Good* vs. *Fair, Poor*). For respondents aged 18 to 64 years, the family referent also indicated whether the respondent received disability-related income from Social Security, the railroad retirement system, or other sources. This we used to classify respondents as receiving disability income or not.

Functional limitations were also assessed during the sampled adult interview by asking respondents whether they experienced difficulties, due to a health problem, in performing 12 activities. These were drawn from two domains: 1) mobility deficits (e.g., reaching, stooping, standing, climbing, walking, sitting, grasping, carrying, and pushing) and 2) participating in common life activities (e.g., going out to shop, seeing a movie, or attending a sporting event; going out to visit friends or attend social gatherings; and engaging in relaxing pursuits such as reading, listening to music, or watching television at home). From this, we created three measures: 1) any mobility deficits reported, 2) any life participation limitation reported, and 3) a summary measure capturing reports of either or both mobility

and/or life participation limitations. Respondents also indicated up to three medical conditions or health problems that caused these limitations. NHIS coded these into 37 categories identical to those listed above. Limitations in the survey question structure prevented us from classifying the reasons for mobility and life participation limitations separately. However, we were able to classify the summary measure of mobility/life participation limitations into those in which MHSA-related conditions were contributory versus those in which they were not. Finally, we created a summary variable to capture whether any functional limitations, both MHSA-related and non-MHSA-related, were reported either in the family level interview or the sampled adult interview.

Mental health indicators—The sampled adult interview included the K-6 Distress Scale, a mental health screening tool for nonclinical populations (Kessler, 2002). The K-6 measures non-specific distress occurring in the 30 days prior to interview by assessing the frequency with which individuals have feelings of sadness, nervousness, restlessness, hopelessness, worthlessness, and that everything is an effort. Scores range from 0 to 24; a standard cutoff score for high psychological distress (scores of 13 or greater) identifies individuals at high risk of meeting diagnostic criteria for serious mental illness. One additional question in the K-6 assesses the extent to which these feelings “interfere with life or activities” (*not at all, a little, some, a lot*). We recoded this item into two categories (no interference vs. any interference). Respondents were also asked if they had seen a mental health professional (a psychiatrist, psychologist, psychiatric nurse, or clinical social worker) in the 12 months prior to interview which we coded as *yes* or *no*.

Finally, NHIS selected a random half of sampled adult respondents to assess the frequency (*a few times a year, monthly, weekly, or daily*) with which they experienced feelings of anxiety and/or depression and the intensity of each of these feelings the last time they occurred (*a little, a lot, or somewhere in between a little and a lot*). To approximate a more clinically relevant measure, we created 2 separate composite variables for both anxiety and depression that classified individuals into one of two groups: those who reported experiencing the mood state at least monthly with high intensity (*a lot*) and those who did not. These measures were moderately correlated with high psychological distress as indexed by the K-6 (for anxiety, $r = 0.41$, $p < 0.001$; for depression, $r = 0.45$, $p < 0.001$). Two additional variables asked respondents (*yes, no*) if they were taking medication to manage feelings of anxiety and depression. From these responses we created two variables: takes anti-anxiety drug (*yes, no*), takes anti-depressant (*yes, no*). Finally, we also created two summary variables. The first identified individuals reporting any anxiety and/or depression with monthly frequency and high intensity. The second captured whether the respondent was taking medication to manage their symptoms.

Demographic characteristics and health insurance status—The interview assessed respondents’ gender, age, race/ethnicity, country of birth, relationship status, educational attainment, family income, region of residence, and current health insurance status. We coded age into one of three categories (*18–34 years, 35–54 years, and 55 years or older*), race/ethnicity into two (*non-Hispanic white vs. all other racial/ethnic backgrounds*), country of birth into two (*U.S. born vs. foreign born*), educational attainment into two (*high*

school degree or less vs. some college or more), and relationship status into two (*married or living with partner vs. single, widowed, separated or divorced*). Family income, weighted by family size, was categorized by NHIS as either below 200% of the federal poverty level (FPL) or equal to or greater than 200% FPL. The NHIS datasets also provide information on residential location using standard U.S. Census region classifications (*Northeast, Midwest, South, and West*). Finally, the NHIS summarized their extensive assessment of health insurance coverage by creating a single variable to identify individuals lacking health insurance coverage at the time of interview.

Analysis

Data were analyzed using Stata (Stata Corporation, 2013) employing both survey design information and weights as advised by the National Center for Health Statistics. Survey design information appropriately inflates standard errors to take into account the greater uncertainty of estimates derived from clustered sampling designs. The sampling weight adjusts for selection probability (e.g. single adults are more likely to be sampled than adults living in multiple adult households), non-response, and post-stratified adjustments of the obtained sample to more closely match the age, gender, and race/ethnicity composition of the U.S. population. Because sexual orientation effects often differ by gender (Cochran & Mays, 2007, 2009) and women and men often experience different patterns of functional limitations (Liang et al., 2008), we adopted a sex-stratified analytic approach. Initial analyses investigated possible demographic differences between heterosexual and LGB women and men separately using logistic regression methods that regressed sexual orientation on age, race, country of birth, relationship status, educational attainment, family income, geographic region, and survey cycle simultaneously. Next, we used logistic and multinomial analyses to investigate sex-stratified sexual orientation differences in insurance status, general health, distress, and functional limitations/disabilities. Here, we adjusted for possible confounding due to the demographic variables listed above as well as survey cycle with one exception: analyses of disability-related income did not adjust for family income. Next, we used similar methods to examine sexual orientation-related differences in mental health treatment utilization, with additional control of confounding due to health insurance status. Finally, to investigate sexual orientation differences in experiences with frequent anxiety and depression, we restricted our sample to those respondents who completed the module wherein these questions were asked. In these analyses, three approaches were utilized. For mood frequencies, we regressed reports of mood experiences on sexual orientation while adjusting for demographic confounding and survey cycle. For analyses investigating health care and medication use, we additionally adjusted for health insurance status. In addition, to assess effect modification of limitation status, we also evaluated the possible interaction between functional limitation status (evidence of any reported limitation in either the family or sample adult interview) and sexual orientation in use of mental health services.

Because LGB respondents were less likely to be partnered than heterosexual respondents, they were also somewhat more likely to be selected as both the family referent and the sampled adult (65.7% of LGB respondents vs. 60.8% of heterosexual respondents, Wald $F(1) = 7.49$, $p < 0.01$). Hence, we repeated our analyses restricting the dataset to respondents

for whom the family referent was the sampled adult. Sexual orientation-linked differences that rose to the level of statistical significance were identical to those obtained in the full sample with one exception (gay and bisexual men were more likely than heterosexual men to rate their health as fair or poor in the restricted sample, results available from the authors). For brevity, we only report findings from the total sample. Below, we provide weighted crude prevalences and their standard errors (*SE*); means (*M*), results of Wald *F* tests adjusted (Adj.) for confounders where appropriate; and adjusted relative risk ratios (*RR*) and their confidence intervals (*CI*). Because functional limitations are strongly related to age, as was sexual orientation, we also report predicted marginal prevalences for disability-related outcomes that adjust for demographic differences between LGB and heterosexual respondents. Significance tests were based on the criterion of $p < 0.05$; all confidence intervals were estimated with 95% certainty.

Results

Demographic correlates of sexual orientation

Overall, 2.3% (*CI*: 2.2%–2.5%) of respondents identified as lesbian, gay, or bisexual, including 2.4% (*CI*: 2.2%–2.6%) of women and 2.3% (*CI*: 2.0%–2.5%) of men. Among women, LGB women differed from heterosexual women on a number of demographic characteristics, including being somewhat younger ($M_{age} = 38.4$ years for sexual minority women vs. $M_{age} = 47.7$ for heterosexual women; Adj. Wald $F(1) = 41.35$, $p < .001$), more likely U.S. born (Adj. Wald $F(1) = 6.56$, $p = .01$), and less likely to be married or cohabiting (Adj. Wald $F(1) = 12.80$, $p < .001$), as well as reporting lower family income (Adj. Wald $F(1) = 4.23$, $p < .05$), and not living in the Midwest (Adj. Wald $F(1) = 2.92$, $p < .05$) (see Table 1). Similarly, among men, sexual minority men differed from heterosexual men in that they were somewhat younger ($M_{age} = 42.2$ years for sexual minority men vs. $M_{age} = 46.2$ for heterosexual men; Adj. Wald $F(1) = 9.09$, $p < .001$), more likely U.S. born (Adj. Wald $F(1) = 21.08$, $p < .001$), less likely to be married or cohabiting (Adj. Wald $F(1) = 110.77$, $p < .001$), possessed more education (Adj. Wald $F(1) = 40.82$, $p < .001$), and were less likely to be living in the Midwest or South (Adj. Wald $F(1) = 4.55$, $p < .01$). However, sexual minorities, both women (Adj. Wald $F(1) = 1.96$, $p = .16$) and men (Adj. Wald $F(1) = 0.21$, $p = .64$), did not differ significantly from heterosexual women or men, respectively, in their levels of health insurance coverage.

Health status and functional limitations

Among women, lesbians and bisexuals were more likely than heterosexuals to evidence high levels of recent psychological distress (Adj. Wald $F(1) = 17.93$, $p < .001$), after adjusting for confounding (see Table 2). They were also more likely to report that psychological distress interfered with their lives (Adj. Wald $F(1) = 24.42$, $p < .001$), that their general health status was somewhat worse (Adj. Wald $F(1) = 7.67$, $p < .01$), and that they had seen a mental health provider in the prior year (Adj. Wald $F(1) = 41.57$, $p < .001$). This higher level of psychological morbidity among LGB women was reflected in more frequent complaints of functional limitations than that seen among heterosexual women (functional limitations reported by the family referent: Adj. Wald $F(1) = 16.82$, $p < .001$; mobility/life participation limitations reported by the respondent: Adj. Wald $F(1) = 17.51$, $p < .001$; and any functional

limitations reported: Adj. Wald $F(1) = 19.56, p < .001$). The types of deficits LGB women reported were not limited to complex social engagement abilities. For example, prevalences of mobility impairments, adjusted for demographic differences, indicated that approximately 48% (*CI*: 43%–52%) of sexual minority women experienced mobility impairments compared to 38% (*CI*: 37%–39%) of heterosexual women (Adj. *RR* = 1.26, *CI*: 1.14–1.38). Similar comparisons of problems in life participation demonstrated adjusted prevalences of 16% (*CI*: 13%–21%) among sexual minority women vs. 12% (*CI*: 12%–13%) among heterosexual women (Adj. *RR* = 1.36, *CI*: 1.07–1.73). These sexual orientation-related differences were not restricted to limitations attributed to MHSA-related causes. Reflecting the elevated disability risk, among women of working age (age 18 to 64 years), LGB women were more likely than similar heterosexual women to be receiving disability pensions (Adj. Wald $F(1) = 10.38, p < .01$).

In contrast, among men, sexual orientation differences were most strongly clustered with markers of mental health morbidity. As was seen among women, gay and bisexual men were more likely than heterosexual men to evidence high levels of psychological distress (Adj. Wald $F(1) = 22.36, p < .001$), to indicate that psychological distress interfered with their lives (Adj. Wald $F(1) = 29.41, p < .001$), and to report having seen a mental health provider in the prior year (Adj. Wald $F(1) = 63.97, p < .001$) (see Table 3). Further, sexual orientation differences were present in measures of functional limitations, including general functional limitations (Adj. Wald $F(1) = 4.73, p < .01$), mobility/life participation limitations (Adj. Wald $F(1) = 10.30, p < .001$), and any functional limitations (Adj. Wald $F(1) = 7.43, p < .001$). However, in each case the differences between sexual minority and heterosexual men lay in greater prevalence of limitations that were attributed to MHSA-related causes. Consistent with these findings, sexual minority men were no more likely than heterosexual men to report fair or poor health (Adj. Wald $F(1) = 1.21, p = .27$), mobility deficits (Adj. *RR* = 1.14, *CI*: 0.99–1.31), or, among men of working age, to report receiving disability pensions (Adj. Wald $F(1) = 0.42, p = 0.52$). However, gay and bisexual men were more likely to report limitations in life participation activities (Adj. *RR* = 1.44, *CI*: 1.08–1.92).

Prominence of mood-related difficulties

Approximately 52% (*CI*: 49.1%–55.6%) of LGB respondents and 50% (*CI*: 49.3%–50.4%) of heterosexual respondents completed the brief adult disability module (Wald $F(1) = 2.12, p = 0.14$). Here, too, there was strong evidence that negative affect was more frequently burdensome for sexual minority persons than for heterosexual persons (see Table 4). Specifically, among women, LGB respondents were more likely than heterosexual women to report experiencing monthly high intensity anxiety (Adj. Wald $F(1) = 15.40, p < .001$), depression (Adj. Wald $F(1) = 13.62, p < .001$), and either or both mood states (Adj. Wald $F(1) = 15.62, p < .001$). Similarly, among men, sexual minority men were more likely than heterosexual men to report high intensity, monthly anxiety (Adj. Wald $F(1) = 42.25, p < .001$), depression (Adj. Wald $F(1) = 16.03, p < .001$), and either or both mood states (Adj. Wald $F(1) = 43.71, p < .001$). Medication use to treat these symptoms was also associated with sexual orientation. LGB women were more likely than heterosexual women to be taking medications to treat anxiety (Adj. Wald $F(1) = 8.90, p < .01$), depression (Adj. Wald $F(1) = 17.80, p < .001$), and/or both symptoms (Adj. Wald $F(1) = 16.18, p < .001$); among

men, gay and bisexual men were more likely than heterosexual men to be using medication to treat anxiety (Adj. Wald $F(1) = 31.87, p < .001$), depression (Adj. Wald $F(1) = 38.60, p < .001$), and/or both symptoms (Adj. Wald $F(1) = 32.25, p < .001$).

Use of mental health services was also strongly and positively related to functional limitations. While only 11% (CI: 10.4%–12.0%) of those individuals without any functional limitations who completed the adult disability module reported use of mental health services, including taking medications to treat anxiety and/or depression or seeing a mental health specialist, nearly 22% (CI: 20.4%–23.0%) of those with a non-MHSA-related functional limitation had utilized care, and fully 76% (CI: 71.6%–80.0%) with a MHSA-related limitation had done so. This use was also associated with sexual orientation status, however tests evaluating the interaction between sexual orientation and functional limitation status in predicting reports of having seen a mental health specialist revealed a significant interaction effect among men (Adj. Wald $F(1) = 14.80, p < .001$) but not among women (Adj. Wald $F(1) = 2.40, p = .09$). Similar tests for use of psychotropic medications also revealed a significant interaction among men (Adj. Wald $F(1) = 6.77, p = .001$) but not among women (Adj. Wald $F(1) = 1.19, p = .30$).

Discussion

Consistent with both predictions from the MSM (Meyer, 2003) and results from earlier studies (Bostwick et al., 2010; Cochran & Mays, 2013; Cohen et al., 2016; Gevonden et al., 2014; Pachankis, Cochran, et al., 2015), we found strong evidence that LGB individuals, when compared to similar heterosexual adults, report higher current rates of depressed mood, anxiety, and psychological distress. Also, as others have observed (Austin et al., 2016; Björkenstam et al., 2016; Boehmer et al., 2014; Cochran & Mays, 2007; Fredriksen-Goldsen et al., 2013; Gonzales & Henning-Smith, 2015; Hsieh & Ruther, 2016; Siordia, 2015), LGB respondents in the NHIS evidenced higher prevalence of functional limitations and disability than did heterosexual respondents. Capitalizing on NHIS's extensive measurement of limitations and disability, we were also able to extend these findings by showing that much of the health disadvantages in mobility, independence, and social engagement that LGB individuals reported were associated with MHSA-related factors. The breadth of these findings underscore that social marginalization of LGB individuals likely has a costly, chronic and harmful impact.

At the same time, we also found evidence of important differences in the patterns of these effects when analyzed separately for men and women. Among men, for example, sexual orientation-related variations in mobility limitations were not prominent, and functional limitations and disabilities were restricted to MHSA-related causes. In contrast, among women, sexual orientation-related differences were seen in measures of both mobility and life participation and were linked to both physical health and MHSA-related causes. While this difference in sexual orientation-related health disparities is not well predicted by the MSM (Meyer, 2003), it is consistent with CAD hypotheses (Dannefer, 2003; DiPrete & Eirich, 2006) that emphasize differential impact of the same stressors depending on earlier patterns of individual and social status advantages and disadvantages. To that end, emerging evidence suggests that sexual minority men and women experience somewhat different

responses and trajectories of health challenges across their lifespans. For example, while a sizeable minority of gay and bisexual men must cope with prevalent HIV infection (Xu et al., 2010), sexual minority men, on the whole, are more physically fit than heterosexual men (Cochran, Björkenstam, & Mays, 2016; Cochran & Mays, 2007). The reasons for this latter difference may reflect dating pressures within the gay male community (Garcia, Muñoz-Laboy, Parker, & Wilson, 2014) more so than the effects of minority stress. In contrast, sexual minority women are more likely than heterosexual women to struggle with obesity, chronic pain, and arthritis (Cochran et al., 2016; Cochran & Mays, 2007) all of which may increase the risk for functional limitations and disability due to non-MHSA-related causes. In other words, CAD differences between LGB women and men may prove to be important additional predictors of sexual orientation-related disparities in health.

Importantly, our study also investigated sexual orientation-related differences in patterns of mental health services utilization among those with or without functional limitations. Like others, we found that LGB individuals have a greater propensity to use mental health services than heterosexual women and men do (Bostwick et al., 2010; Cochran & Mays, 2013; Pachankis, Cochran, et al., 2015). However, here, too, we also observed hints of possible sex differences in patterns of services use among LGB individuals. For example, among LGB women, as compared to heterosexual women, the greater propensity to use services is evident among those with and without functional limitations. However, for men sexual orientation differences were greatest among those men without MHSA-related functional limitations. Whether this reflects treatment seeking for assistance with stigma-related issues (Pachankis, Hatzenbuehler, et al., 2015) is indeterminable but worthy of future research.

Three limitations warrant comment in contextualizing these results. First, due to sample size limitations we were unable to investigate heterogeneity of effects within sexual minority subgroups (e.g., gay vs. bisexual). Elsewhere (Bostwick et al., 2010; Cochran & Mays, 2013; Fredriksen-Goldsen et al., 2013; Pachankis, Cochran, et al., 2015), research strongly suggests that these differences in effects likely exist. Only with additional years of data collection in the annually mounted NHIS will the dataset be capable of supporting such work. Second, the NHIS does not assess the content of services provided by mental health providers or the provision of mental health services by non-specialists, such as primary care physicians. This has two implications. First, although we have inferred that sexual minorities may be using mental health services to address issues of coping with discrimination or to develop resiliency skills, we have no means of evaluating the validity of that inference. Second, if there are sexual orientation-linked differences in seeking assistance from different types of providers our results will be biased in indeterminable ways. For example, if LGB individuals are more likely than heterosexual persons to receive treatment from primary care physicians, we will have underestimated sexual orientation differences. A third study limitation is that the NHIS is a health surveillance survey for the general population and does not include measurement of constructs, such as perceived discrimination or minority stress. While we have inferred that the sexual orientation-related disparities observed here arise from the pernicious effects of social adversity and the ways in which it shapes, through cumulative advantages and disadvantages, the lives of LGB persons, a direct test of that hypothesis is not possible with the current dataset.

Nevertheless, our findings strongly support the perspective that social adversity serves as a chronic stressor for a sizable minority of LGB individuals (Cochran, 2001; Cochran & Mays, 2009; Feinstein et al., 2012; Hatzenbuehler, 2009; Lehavot & Simoni, 2011; Meyer, 2003; Meyer et al., 2008). Our findings also bring some clarity to these chronic health disparities suggesting that gay and bisexual men seem to experience a focal MHSA-related burden while lesbian and bisexual women evidence both physical and mental health-related limitations. Whether this reflects differential effects of minority stress or arises from structural differences in the lives of LGB women and men borne of their life course experiences is currently unknown.

Given the sexual orientation-linked disadvantages observed here, three key concerns bear consideration. First, in a recent study of changes following the introduction of the Affordable Care Act (ACA), LGB individuals are now more likely to have insurance coverage than was true in the past, however they still experience barriers in access to and affordability of care (Skopec & Long, 2015). This is particularly salient in seeking and obtaining care from providers who are able to provide culturally competent care. Because much of the ACA coverage is new, those providers most competent to deliver such services may be in high demand or unavailable (Skopec & Long, 2015). Second, whether the practitioners LGB individuals do encounter will have the requisite cultural competence remains an open question (Hope & Chappell, 2015; Lyons et al., 2010; McGeorge & Carlson, 2016). And finally, which approaches to counseling and psychotherapy are most effective at addressing stigma-related distress and needs for resiliency has yet to be determined (Pachankis, Hatzenbuehler, et al., 2015). Our ability to answer these questions or to track whether anti-LGB discrimination plays a role in access to effective MHSA-related care for LGB individuals is currently limited in existing national datasets. Nevertheless, it is essential that we ask and answer these questions as we evaluate the contribution of the ACA to addressing and eliminating sexual orientation-related health disparities. This is critical particularly in the area of MHSA-related functional limitations, where available workforce issues may play a significant role.

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Public Health Significance

This study investigates sexual orientation differences in functional limitations, especially mental health-related, and services utilization. Lesbian, gay, and bisexual (LGB) individuals experience higher rates of mental health-related functional limitations as compared to similar heterosexual adults, with LGB women experiencing higher risk than heterosexual women for non-mental health-related limitations as well. LGB individuals are also more likely than heterosexual individuals to use mental health services and psychoactive medications regardless of their functional limitation status. Findings underscore both the possible impact of chronic stress on the lives of LGB individuals and the diversity of mental health needs within the LGB population.

Table 1
 Characteristics of respondents in 2013–2014 National Health Interview Survey by gender and sexual orientation: Weighted prevalences and results of logistic regression models shown

Characteristics	Women						Men					
	Sexual Minority		Heterosexual		Adjusted RR (95% CI)		Sexual Minority		Heterosexual		Adjusted RR (95% CI)	
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)
<u>Age</u>												
18 to 34 years	48.5	(2.4)	29.0	(0.4)	Ref.		37.6	(2.5)	31.1	(0.4)	Ref.	
35 to 54 years	35.4	(2.2)	34.2	(0.3)	0.71 (0.58–0.86)		39.5	(2.5)	35.2	(0.4)	1.35 (1.06–1.73)	
55 years or older	16.0	(1.7)	36.8	(0.4)	0.27 (0.21–0.36)		22.9	(2.0)	33.7	(0.4)	0.81 (0.62–1.06)	
Non-Hispanic White	68.0	(2.2)	66.2	(0.4)	1.24 (0.96–1.59)		69.7	(2.4)	66.9	(0.4)	0.97 (0.76–1.25)	
Foreign born	11.3	(1.5)	17.9	(0.3)	0.62 (0.43–0.90)		9.4	(1.2)	18.8	(0.3)	0.49 (0.36–0.66)	
Married/cohabiting	46.1	(2.5)	57.9	(0.4)	0.68 (0.55–0.84)		37.1	(2.5)	64.2	(0.4)	0.32 (0.26–0.39)	
Education: Some college or more	66.9	(2.3)	61.7	(0.4)	1.15 (0.92–1.45)		75.2	(2.2)	58.7	(0.4)	2.13 (1.69–2.69)	
Family income 200% or more of FPL	57.8	(2.4)	64.5	(0.4)	0.79 (0.64–0.99)		72.6	(2.2)	70.0	(0.4)	1.12 (0.91–1.39)	
<u>Location of residence</u>												
West	25.8	(2.0)	22.3	(0.4)	Ref.		29.6	(2.1)	22.9	(0.4)	Ref.	
Northeast	17.9	(2.1)	17.3	(0.3)	0.90 (0.66–1.24)		18.5	(1.9)	17.5	(0.3)	0.84 (0.64–1.11)	
Midwest	19.2	(1.8)	22.5	(0.4)	0.67 (0.51–0.88)		17.8	(2.2)	23.2	(0.4)	0.58 (0.42–0.79)	
South	37.2	(2.2)	37.9	(0.4)	0.82 (0.66–1.01)		34.1	(2.4)	36.4	(0.4)	0.75 (0.60–0.94)	
Lacks health insurance	18.3	(1.8)	13.3	(0.2)	1.15 (0.95–1.40)		16.2	(1.8)	16.7	(0.3)	1.05 (0.86–1.29)	

Note. Sexual minorities included 878 lesbian, gay, and bisexual women, 786 gay and bisexual men; heterosexuals included 37,1875 women and 29,967 men. *SE* = Standard Error; *RR* = Relative Risk; *CI* = Confidence interval; *FPL* = Federal Poverty Limit, *Ref* = referent. Demographic differences evaluated by logistic regression methods regressing sexual orientation on all characteristics (gender, age, race/ethnicity, nativity, relationship status, education, family income, geographic region, and survey cycle) simultaneously. Differences in health insurance coverage evaluated by logistic regression methods regressing insurance status on sexual orientation, other demographic characteristics, and survey cycle simultaneously.

Table 2
 Indicators of distress, functional limitations, and mental health services use among women, age 18 and older, in 2013–2014 National Health Interview Survey by sexual orientation: Crude and adjusted prevalences and partial results of regression models shown

Morbidity indicators	Crude Prevalence				Adjusted Prevalence				
	Sexual Minority		Heterosexual		Sexual Minority		Heterosexual		
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	
High psychological distress, past 30 days	7.5	(1.0)	3.8	(0.1)	7.2	(1.0)	3.8	(0.1)	1.88 (1.41–2.50)
Psychological distress interferes with life	33.7	(2.2)	21.4	(0.3)	31.3	(2.2)	21.5	(0.3)	1.46 (1.27–1.68)
Overall health status rated fair/poor	14.5	(1.7)	13.4	(0.2)	18.3	(2.0)	13.3	(0.2)	1.38 (1.11–1.71)
Saw mental health provider, past year	18.5	(1.7)	8.1	(0.2)	15.6	(1.4)	8.1	(0.2)	1.92 (1.59–2.32)
<u>General functional limitations (family referent reported)</u>									
Any—Not MHSA-related	11.0	(1.5)	13.8	(0.2)	15.8	(1.9)	13.7	(0.2)	1.15 (0.91–1.46)
Any—MHSA-related	7.0	(1.1)	2.6	(0.1)	6.6	(1.1)	2.6	(0.1)	2.52 (1.85–3.47)
<u>Mobility deficits/life participation limitations (respondent reported)</u>									
Any—Not MHSA-related	35.2	(2.4)	36.3	(0.4)	43.2	(2.4)	36.1	(0.4)	1.20 (1.07–1.33)
Any—MHSA-related	5.6	(0.9)	2.3	(0.1)	5.0	(0.8)	2.3	(0.1)	2.11 (1.55–2.87)
<u>Any limitations reported by either source</u>									
Any—Not MHSA-related	34.5	(2.4)	36.5	(0.4)	42.2	(2.4)	36.3	(0.4)	1.16 (1.04–1.30)
Any—MHSA-related	8.4	(1.1)	3.8	(0.1)	7.6	(1.0)	3.8	(0.1)	2.00 (1.54–2.60)
Receives disability income (18–64 years only)	9.2	(1.5)	6.3	(0.2)	10.7	(1.7)	6.2	(0.2)	1.71 (1.25–2.35)

Note. *N* = 38,063, including 878 lesbian, gay, and bisexual women; 37,185 heterosexual women. *SE* = Standard Error; *RR* = Relative Risk; *CI* = Confidence interval; MHSA = mental health and substance abuse. Predicted marginals (adjusted prevalences) and adjusted *RR* were obtained by logistic or multinomial logistic regression methods evaluating sexual orientation differences while adjusting for confounding due to demographic characteristics (age, race/ethnicity, nativity, relationship status, education, family income, geographic region) and survey cycle. Mental health provider treatment differences were further adjusted for health insurance status while disability income was not adjusted for family income.

Table 3

Indicators of distress, functional limitations, and mental health services use among men, age 18 and older, in 2013–2014 National Health Interview Survey by sexual orientation: Crude and adjusted prevalences and partial results of regression models shown

Morbidity indicators	Crude Prevalence			Adjusted Prevalence			Adjusted <i>RR</i> (95% <i>CI</i>)
	Sexual Minority	Heterosexual		Sexual Minority	Heterosexual		
	% (<i>SE</i>)	% (<i>SE</i>)	%	% (<i>SE</i>)	% (<i>SE</i>)	%	
High psychological distress, past 30 days	7.5 (1.5)	2.8 (0.1)	2.8	7.6 (1.5)	2.8 (0.1)	2.8	2.68 (1.81–3.97)
Psychological distress interferes with life	28.3 (2.2)	16.4 (0.3)	16.4	26.8 (2.2)	16.4 (0.3)	16.4	1.64 (1.38–1.93)
Overall health status rated fair/poor	11.8 (1.4)	12.3 (0.2)	12.3	14.0 (1.6)	12.3 (0.2)	12.3	1.14 (0.90–1.44)
Saw mental health provider, past year	20.5 (2.4)	5.8 (0.2)	5.8	17.3 (2.0)	5.8 (0.2)	5.8	2.96 (2.31–3.78)
<u>General functional limitations (family referent reported)</u>							
Any—Not MHSA-related	10.9 (1.5)	12.3 (0.2)	12.3	11.8 (1.5)	12.3 (0.2)	12.3	0.96 (0.75–1.22)
Any—MHSA-related	5.3 (1.2)	2.2 (0.1)	2.2	4.4 (0.9)	2.2 (0.1)	2.2	1.97 (1.29–3.00)
<u>Mobility deficits/life participation limitations (respondent reported)</u>							
Any—Not MHSA-related	25.6 (2.1)	27.1 (0.4)	27.1	29.1 (2.2)	27.0 (0.4)	27.0	1.08 (0.93–1.25)
Any—MHSA-related	5.5 (1.3)	1.6 (0.1)	1.6	4.8 (1.1)	1.6 (0.1)	1.6	2.99 (1.86–4.82)
<u>Any limitations reported by either source</u>							
Any—Not MHSA-related	26.2 (2.1)	28.2 (0.4)	28.2	29.8 (2.2)	28.2 (0.4)	28.2	1.06 (0.91–1.22)
Any—MHSA-related	7.5 (1.5)	2.9 (0.1)	2.9	6.3 (1.2)	2.9 (0.1)	2.9	2.14 (1.45–3.15)
Receives disability income (18–64 years only)	8.1 (1.4)	6.9 (0.2)	6.9	7.7 (1.2)	7.0 (0.2)	7.0	1.11 (0.81–1.52)

Note. *N* = 30,753, including 786 gay and bisexual men and 29,967 heterosexual men. *SE* = Standard Error; *RR* = Relative Risk; *CI* = Confidence interval; MHSA = mental health and substance abuse. Predicted marginals (adjusted prevalences) and adjusted *RR* were obtained by logistic or multinomial logistic regression methods evaluating sexual orientation differences while adjusting for confounding due to demographic characteristics (age, race/ethnicity, nativity, relationship status, education, family income, geographic region) and survey cycle. Mental health provider treatment differences were further adjusted for health insurance status while disability income was not adjusted for family income.

Self-reported anxiety, depression, mental health services use, and functional limitations among adults, age 18+, by gender and sexual orientation, 2013–2014 National Health Interview Survey: Prevalences and results of logistic regression models shown

Table 4

	Women				Men			
	Sexual Minority		Heterosexual		Sexual Minority		Heterosexual	
	%	(SE)	%	(SE)	%	(SE)	%	(SE)
<u>Symptoms and medication use</u>	(n = 441)	(n = 18,586)	(n = 409)	(n = 14,955)				
Experiences anxiety ¹	13.0	(2.1)	5.7	(0.2)	12.6	(2.4)	3.5	(0.2)
Takes anxiety medication	17.0	(2.3)	11.2	(0.3)	16.2	(2.5)	5.7	(0.3)
Experiences depression ¹	9.7	(1.8)	4.2	(0.2)	6.7	(1.5)	2.6	(0.2)
Takes depression medication	18.0	(2.4)	10.2	(0.3)	17.1	(2.8)	5.2	(0.3)
Experiences either mood ¹	16.4	(2.2)	7.4	(0.3)	14.4	(2.4)	4.5	(0.2)
Takes medication for either	22.1	(2.7)	13.6	(0.3)	19.5	(2.8)	7.0	(0.3)
Services use by functional limitations status								
<u>No functional limitations</u>	(n = 228)	(n = 10,436)	(n = 265)	(n = 9,784)				
Mental health provider seen	11.9	(2.8)	5.4	(0.3)	16.6	(3.4)	3.3	(0.2)
Takes mood medication ²	12.5	(2.6)	7.5	(0.3)	7.2	(2.3)	3.1	(0.2)
<u>Only non-MHSA limitations</u>	(n = 161)	(n = 7,313)	(n = 115)	(n = 4,673)				
Mental health provider seen	20.3	(4.6)	7.8	(0.5)	27.3	(6.3)	6.5	(0.5)
Takes mood medication ²	20.3	(4.3)	17.9	(0.6)	32.8	(6.3)	11.3	(0.6)
<u>Any MHSA-related limitations</u>	(n = 52)	(n = 837)	(n = 29)	(n = 498)				
Mental health provider seen	64.5	(9.8)	46.2	(2.4)	64.0	(11.3)	56.3	(2.9)
Takes mood medication ²	78.8	(8.0)	68.2	(2.3)	76.5	(9.4)	63.9	(3.0)

Note. Respondents were randomly selected to complete the Functioning and Disability module of the Sampled Adult Survey. *SE* = Standard Error; *RR* = Relative Risk; *CI* = Confidence interval; *MHSA* = mental health and substance abuse. Adjusted *RR* was obtained by logistic regression methods evaluating sexual orientation differences while adjusting for confounding due to demographic characteristics (age, race/ethnicity, nativity, relationship status, education, family income, geographic region) and survey cycle. Differences in medication and health services use were further adjusted for health insurance status.

¹ Person reports experiencing anxiety or depression of high intensity at least monthly.

² Person currently takes medication for anxiety and/or depression.