

Original Investigation

The Experience of Symptoms of Depression in Men vs Women

Analysis of the National Comorbidity Survey Replication

Lisa A. Martin, PhD; Harold W. Neighbors, PhD; Derek M. Griffith, PhD

IMPORTANCE When men are depressed they may experience symptoms that are different than what is included in the current diagnostic criteria.

OBJECTIVE To explore whether sex disparities in depression rates disappear when alternative symptoms are considered in the place of, or in addition to, more conventional depression symptoms.

DESIGN, SETTING, PARTICIPANTS, AND MAIN OUTCOMES AND MEASURES Using data from the National Comorbidity Survey Replication, a nationally represented mental health survey, we evaluated sex differences in symptom endorsement in 2 new scales that included alternative depression symptoms. We analyzed sex differences in symptom endorsement using 2-sided, design-based, .05-level *t* tests and multivariate logistic regression to identify predictors of depression.

RESULTS Men reported higher rates of anger attacks/aggression, substance abuse, and risk taking compared with women. Analyses using the scale that included alternative, male-type symptoms of depression found that a higher proportion of men (26.3%) than women (21.9%) ($P = .007$) met criteria for depression. Analyses using the scale that included alternative and traditional depression symptoms found that men and women met criteria for depression in equal proportions: 30.6% of men and 33.3% of women ($P = .57$).

CONCLUSIONS AND RELEVANCE When alternative and traditional symptoms are combined, sex disparities in the prevalence of depression are eliminated. Further study is needed to clarify which symptoms truly describe men's experiences of depression.

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Author Affiliations: Women's & Gender Studies and Health Policy Studies, University of Michigan, Dearborn (Martin); Program for Research on Black Americans, Institute for Social Research, Center on Men's Health Disparities, Department of Health Behavior & Health Education, School of Public Health, University of Michigan, Ann Arbor (Neighbors); Center on Men's Health Disparities, Department of Health Behavior and Health Education, School of Public Health, University of Michigan, Ann Arbor (Griffith); now with the Center for Medicine, Health, and Society, Vanderbilt University, Nashville, Tennessee (Griffith).

Corresponding Author: Lisa A. Martin, PhD, Women's & Gender Studies and Health Policy Studies, University of Michigan, Dearborn, 4901 Evergreen Rd, Dearborn, MI 48128 (martilis@umich.edu).

Depression is a costly and debilitating illness; approximately 16% of the US population (>32 million people) will meet the criteria for major depressive disorder in a given year.¹ Typically, women are diagnosed with depression twice as often as men. This sex ratio appears in almost every setting, including Western and most non-Western community studies.²⁻⁵ Most research exploring this difference focuses on explanations for why women are at greater risk for developing depression.

More than 10 years ago, an alternative approach to explaining this disparity was proposed. This literature critiques the validity of the current diagnostic criteria, arguing that men may experience alternative depression symptoms.⁶ In part because traditional depressive symptoms (eg, sadness, crying) are at odds with societal ideals of masculinity, men may be reluctant to report experiencing these symptoms. Second, men's experiences of depression may manifest with symptoms that are not currently included in traditional diagnostic criteria. Addis⁷ proposes 4 conceptual frameworks within the exist-

ing literature that address how gender shapes men's experiences, expressions, and reactions to depression: (1) the sex differences framework, (2) the masked depression framework, (3) the masculine depression framework, and (4) the gendered response framework.

The sex differences framework is rooted in the idea that the construct of depression is the same in men and women and seeks to investigate sex differences in a range of related variables, including symptoms.⁷ Although this has been a popular approach to date, it is often critiqued for relying on oppositional binaries that understand "male depression" only as it is contrasted with "female depression," which fails to acknowledge the heterogeneity that exists within these groups.

The masked depression framework proposes that men are more likely to express their emotional and psychological distress in the form of "depressive equivalents"⁷ because direct admission of sadness and emotional weakness or vulnerability in men is seen as socially unacceptable.⁸ The biggest cri-

tique of this framework is that it remains difficult to identify the depressive equivalents.

The masculine depression framework hypothesizes that the struggle to adhere to hegemonic masculine norms places men at risk for experiencing an alternative depression variant often characterized by externalizing symptoms.⁷ Rather than appearing sad, men experiencing emotional pain are more likely to react with anger, self-destructive behavior, self-distracted, or numbing of pain with substance use, gambling, womanizing, and workaholicism.⁹ Others have proposed that irritability could be the key symptom linking men and depression.⁸ Winkler et al¹⁰ found that male patients with depression scored significantly higher on irritability, were more prone to overreact to minor annoyances, experienced anger attacks (sudden spells of anger and aggression with physical features similar to panic attacks), had lower impulse control, exhibited greater substance use, and experienced more hyperactive behavior compared with depressed female patients.^{9,11}

The gendered response framework states that men's responses to negative affect, including depressed mood, grief, and sadness, are shaped by men's adherence to or rejection of hegemonic masculinity. Gender socialization can direct some men to withhold or restrict emotional expression, leaving men with limited ways to express their feelings of emotional pain and psychological distress. Therefore, clinicians would need to look at alternative negative outcomes to identify depression in their patients.⁷

Currently, 2 scales exist that evaluate the presence of alternative "male-type" depression symptoms in groups of clinical patients. The Gotland Male Depression Scale (GMDS) was developed as part of a study investigating suicide in Sweden and originally validated with a sample of men in treatment for substance abuse.^{3,12,13} Since then, the GMDS has been used in a variety of settings with clinical samples of men and women.¹⁴ The second measure designed to identify male-type depression is the Masculine Depression Scale (MDS).¹⁵⁻¹⁷ The MDS is a self-report scale designed to capture alternative symptoms proposed in the literature to be more common in men's presentation of depression. Men who scored high on masculine norms adherence were less likely to endorse traditional depression items. Although both the GMDS and the MDS have provided empirical evidence supporting men's alternative expression of depression, neither scale has been used in a nationally representative sample of US residents.

The present study was a secondary analysis of the National Comorbidity Survey Replication (NCS-R),¹⁸ a nationally representative sample of mental health data. We addressed a gap identified by Addis's masculine depression frameworks⁷ by combining externalizing symptoms (eg, substance abuse, irritability, and anger) with traditional depression symptoms within the context of a nationally representative self-report sample. We created 2 new depression measures by combining externalizing symptoms of depression proposed by 2 previously validated measures of male-type depression, the GMDS and the MDS, with traditional depression symptoms. The first scale, referred to as the Male Symptoms Scale (MSS), exclusively includes alternative male-type symp-

ptoms of depression, while the second scale combines these symptoms with traditional depression items to create the Gender Inclusive Depression Scale (GIDS) (see the eAppendix in the Supplement for a description of the GIDS).

Methods

Sample Description

The present study uses secondary data analysis of the NCS-R, a nationally representative survey of the incidence and prevalence of mental disorders among English-speaking adults of the United States. It includes assessments based on the diagnostic criteria of the American Psychiatric Association as reported in the *DSM-IV*.⁶ The NCS-R interview was administered in 2 parts between February 2001 and April 2003. Part I included a core diagnostic assessment of all respondents (N = 9282). Part II was administered to a subset of the part I respondents who met lifetime criteria for any core disorder plus a 1-in-3 probability subsample of other respondents (n = 5692). Part II questioned respondents about correlates and additional disorders. (For a full description of the development of the NCS-R, see Pennell and colleagues.¹⁸) This study used the part II sample.

Creation of the MSS and GIDS

We used a 2-step process to create the 2 scales. One of us (L.A.M.) conducted an extensive literature review to construct a list of alternative male-type depression symptoms. She then compared this list against the NCS-R questionnaire and data set to determine whether appropriate variables capturing the desired symptoms could be identified. eTable 1 in the Supplement lists the symptoms identified from the literature review and whether they were included in the MSS or GIDS. Symptoms were excluded from the scales for one of 3 possible reasons: (1) symptoms were deemed inappropriate, (2) equivalent items were not available, or (3) the number of people for whom data were available for a symptom was too small to be useful for the analysis (ie, <250 people).

The first scale developed for the present analysis is the MSS, which was developed to assess a male-type depression. It assesses 8 constructs that have been proposed in the literature as externalizing symptoms of depression in men: (1) irritability, (2) anger attacks/aggression, (3) sleep disturbance, (4) alcohol/other drug abuse, (5) risk-taking behavior, (6) hyperactivity, (7) stress, and (8) loss of interest in pleasurable activities. Two of the symptoms included in the MSS (sleep disturbance and loss of interest in pleasurable activities) are part of traditional measures of depression but were included because they address externalizing actions and appear as symptoms in either the GMDS or the MDS.

The second scale designed to assess male depression is the GIDS, which consists of 15 symptoms. The GIDS includes all the MSS symptoms as well as 7 traditional symptoms of depression, including sad/depressed mood, loss of vitality, tiredness, ambivalence, anxiety/uneasiness, and complaintiveness (feeling pathetic). See the eAppendix in the Supplement for all the items, including response options. Nineteen of the

25 items appear in the screening section of the NCS-R, 3 items were taken from the 30-day symptoms assessment portion, and 1 item each came from Neurasthenia, Personality, and Mania. Most items assess the lifetime presence of the symptom; therefore, we frame the prevalence of the depression using the MSS and GIDS as lifetime estimates of depression.

Scoring the MSS and GIDS

We calculated a simple index for each of the 2 scales that added 1 point for each symptom endorsed in the scale. Symptoms were considered present as long as one of the items assessing that construct was endorsed. Scores on the MSS can range from 0 to 8. Respondents were divided into 2 categories: individuals with scores of 1 to 4 were classified as not meeting depression criteria, and those with scores of 5 or higher were considered depression cases. The GIDS includes 25 items assessing 15 symptoms, and GIDS scores can range from 0 to 15. We split this group into 3 severity levels: respondents with GIDS scores of 1 to 4 were labeled mild cases, not meeting depression criteria, those with scores of 5 to 9 symptoms were considered moderate cases, and those with scores ranging from 10 to 15 were labeled severe cases. We later combined the moderate and severe groups so that respondents with a score of 5 or higher on a scale were identified as meeting criteria for depression. The 5-point cutoff is modeled after the *DSM-IV* definition of major depressive disorder: the presence of at least 5 symptoms of depression that occur within the same 2-week period is one of the main requirements for meeting the diagnostic criteria for major depression.⁶

Statistical Analysis

We used STATA 10.0 statistical software (SE version; StataCorp LP) for all statistical analyses.¹⁹ The sampling methods used in the data collection necessitated using the complex survey data methods in the STATA statistical package to correctly calculate the standard errors. Internal consistency was measured by Cronbach α . Values of 0.7 or greater are acceptable, whereas values of 0.6 or less indicate that the items may not be related or do not measure the same construct.²⁰ Concurrent validity of the MSS and GIDS was investigated by correlational analyses with lifetime diagnoses of major depressive episode (MDE), alcohol abuse, other drug abuse, and intermittent explosive disorder (IED). Bivariate analyses tested for potential sex differences in symptom endorsement for each of the newly constructed depression scales. Statistical significance was evaluated using 2-sided, design-based, .05-level tests.

Hypotheses

Hypothesis 1 was that the MSS and GIDS will exhibit a positive strong correlation with MDE and be moderately correlated with alcohol abuse, other drug abuse, and IED. If the new scales are indeed measuring depression, we expect them to be closely correlated with an existing measure of depression. If men mask depression with substance abuse, as suggested in the literature, we would expect the 2 scales to be positively related to alcohol and other drug abuse. Because anger has been theorized to be a depressive symptom for men and IED has demonstrated moderate but significant comorbidity with mood

disorders, we expect to find a moderate relationship between IED and the MSS and GIDS.²¹

Hypothesis 2 was that male depression as measured by the MSS will be more prevalent among men than women. The MSS includes symptoms that depressed men could be more willing to admit to *in the place of* traditional depression symptoms. The MSS is based on the literature showing that men are more prone to irritability, hyperactivity, violence, and somatic symptoms (energy loss and sleep issues).^{10,11,22} Although it is possible that some women will endorse these atypical male-type symptoms, if the MSS truly captures male depression, then depression should be more prevalent among men than women.

Hypothesis 3 was that the prevalence of male depression as measured by the GIDS will result in no gender differences. In contrast to the MSS, the GIDS takes a different approach. The GIDS combines the male-type symptoms of the MSS with several traditional symptoms of depression. Thus, the GIDS is designed to be inclusive of both traditional and male-specific symptoms of depression. This hypothesis assumes that male depression is not a separate disorder from major depression but that the current symptom profile does not include symptoms that reflect men's experiences. If this is the case, then the GIDS will identify an equal number of depression cases across the sexes.

Hypothesis 4 was that men will endorse the nontraditional symptoms with greater frequency than women will. This final hypothesis investigates whether there are sex differences among the specific items that have been added as alternative expressions of depression. So far, the literature reports mixed results regarding symptom endorsements. Möller-Leimkühler et al¹⁷ used the GMDS in a clinical sample of men and women and found no differences in the percentages of item endorsement between the sexes. Winkler et al¹⁰ found that male patients with depression scored significantly higher on irritability, experienced anger attacks, had lower impulse control, exhibited greater substance use, and experienced more hyperactive behavior compared with depressed female patients.

Results

Sample Characteristics

The demographic characteristics of the sample are summarized in **Table 1**. There were significantly more women in the sample (3310 [58.5%]) compared with men (2382 [41.5%]). The mean age of respondents was 45.2 years, 73.4% of the sample was non-Hispanic white, and more than half (51.6%) had some education beyond high school. The mean annual household income was \$59 575. Men's mean and median incomes were both significantly higher than women's. The mean income for men was \$63 365 vs \$49 327 for women, and the median income was \$53 500 for men compared with \$44 000 for women.

Internal Consistency

Internal consistency, as measured by Cronbach α , assesses the correlation of items within a measure or subscale. Both scales demonstrated acceptable internal consistency: the Cronbach α for the MSS was 0.71 and for the GIDS was 0.78.

Concurrent Validity

We ran correlational analysis to investigate the concurrent validity of the MSS and the GIDS with theoretically related constructs. Table 2 summarizes the correlation coefficients among the MSS, the GIDS, and MDE, other drug abuse, alcohol abuse, and IED. We tested the hypothesis that both alternative measures of depression would be significantly positively correlated with a traditional measure of depression, and this hypothesis was supported: the correlation coefficient for MDE and the MSS was 0.70 and for MDE and the GIDS was 0.85. The only relationship that showed a stronger relationship was between the MSS and the GIDS, as would be expected given that

the MSS is a component of the GIDS. Positive strong to moderate relationships were found between the 2 scales and alcohol and other drug abuse, with correlation coefficients ranging from 0.46 to 0.32. The 2 scales demonstrated positively weak relationships to IED (coefficients were 0.26 and 0.23 for the MSS and GIDS, respectively).

Male Symptoms Scale

Table 3 summarizes the MSS findings. The prevalence of depression using the MSS was 23.8%, and the mean score was 6.06. Hypothesis 2 stated that depression would be more prevalent among men than women when assessed by the MSS. This

Table 1. Demographic Characteristics

	Total (n = 5692)	Men (n = 2382)	Women (n = 3310)
Age, mean, y, %	45.2	44.3	46.0
18-24	14.6	7.0	7.6
25-34	16.0	7.3	8.7
35-44	21.1	10.0	11.0
45-54	19.6	9.03	10.6
55-64	12.1	5.4	6.7
≥65	16.6	6.6	10.0
Race/ethnicity ^a			
Non-Hispanic white	73.4	34.2	39.2
Non-Hispanic black	11.1	4.4	6.7
Hispanic	10.6	4.8	5.5
Other	5.1	2.0	3.1
Education, No. of years, %			
Less high school, 0-11	16.0	7.6	8.4
Completed high school, 12	32.5	14.3	18.2
Some college, 13-15	27.2	11.7	15.4
College degree or higher, ≥16	24.4	11.8	12.7
Marital status			
Never married	22.4	10.9	22.4 ^b
Married	56.7	28.5	28.2
Separated/widowed/divorced	20.9	5.9	15.0 ^b
Annual household income			
Median, \$	47 500	53 500 ^b	44 000
Mean, \$	59 575	63 365	49 327
Range, \$, %			
0-14 999	15.8	5.2	10.6 ^b
15 000-34 999	21.1	8.7	12.4 ^b
35 000-74 999	33.9	16.6	17.3
≥75 000	29.2	15.0	14.3

^a Hispanic encompasses the following categories: Cuban, Puerto Rican, Mexican, and all other Hispanic.

^b $P \leq .05$.

Table 2. Correlations Examining the Concurrent Validity of the Male Symptoms Scale and the Gender Inclusive Depression Scale^a

	1	2	3	4	5	6
1. Male Symptoms Scale	1.0					
2. Gender Inclusive Depression Scale	0.86	1.0				
3. Major depressive episode, lifetime	0.70	0.85	1.0			
4. Other drug abuse, lifetime	0.42	0.32	0.11	1.0		
5. Alcohol abuse, lifetime	0.46	0.35	0.14	0.63	1.0	
6. Intermittent explosive disorder, lifetime	0.26	0.23	0.12	0.11	0.14	1.0

^a Data are given as correlation coefficients. All correlations were significant at $P < .001$.

Table 3. Male Symptoms Scale Results: Item Endorsement, Mean Score, and Prevalence of Male Depression

Item Description	% (SE)		
	Total	Men	Women
Stress	68.9 (1.6)	63.3 (1.9)	75.2 (2.4) ^a
Irritability	90.3 (1.4)	86.6 (1.9)	94.7 (1.9) ^a
Anger attacks/aggression	92.05 (1.2)	94.85 (1.9) ^a	88.94 (1.4)
Sleep problems	37.7 (1.5)	29.2 (2.1)	47.1 (1.9) ^a
Alcohol/other drug abuse	51.6 (1.9)	61.4 (3.0) ^a	40.6 (1.9)
Loss of interest	89.7 (.973)	87.8 (1.5)	91.8 (1.0) ^b
Risk-taking behavior	41.6 (1.5)	52.7 (2.0) ^a	29.1 (2)
Hyperactivity	57.9 (1.4)	57.6 (2.1)	58.4 (1.8)
Mean score	6.06	6.05	6.07
Prevalence, %	23.8	26.3 ^c	21.9

^a $P \leq .001$.^b $P \leq .05$.^c $P \leq .01$.

hypothesis was supported: the prevalence of depression in men was 26.3% but the prevalence in women was 21.9%, a significant difference ($P = .007$). We also found sex differences in the rate of endorsement of the specific items constituting the MSS. Men endorsed the following items at significantly higher rates than women: anger attacks/aggression, substance abuse, and risk-taking behavior. Women endorsed 4 symptoms at significantly greater rates than men: stress, irritability, sleep problems, and loss of interest in things you usually enjoy, such as work, hobbies, and personal relationships.

Gender Inclusive Depression Scale

Using the 5-point cutoff, we found no sex difference in the prevalence of depression as assessed by the GIDS, which confirmed our third hypothesis. We also compared prevalence by the 3 severity levels: mild (1-4 symptoms), moderate (5-9 symptoms), and severe (10-15 symptoms). As a result, 63.2% of men and 62.0% of women fell into the mild category, 28.3% of men and 28.9% of women fell into the moderate category, and 8.5% of men and 9.1% of women fell into the severe category. No significant sex differences were demonstrated at any severity level.

Hypothesis 4 stated that men would endorse the alternative symptoms of depression at higher rates than women, but the results of these analyses were mixed. Men endorsed substance abuse, anger attacks/aggression, and risk-taking behavior at higher rates than women when depression was assessed by the MSS (Table 3) (see eTable 2 in the Supplement for the GIDS item endorsements). When depression was assessed using the GIDS, men endorsed anger attacks/aggression, substance abuse, risk-taking behavior, and hyperactivity more than women. Women endorsed 6 symptoms at significantly higher rates than men: stress, indecisiveness, anxiety, sleep disturbance, depressed mood, and complaintiveness. Irritability was endorsed equally by men and women. Examining the top endorsed symptoms revealed similar patterns for men and women. Depressed mood was the principal symptom for both men and women, and anger attacks/aggression, stress, irritability, and anxiety/uneasiness constituted the remainder of the top 5 symptoms reported for both sexes.

Discussion

This is the first study, to our knowledge, to assess the implications of considering alternative, male-type symptoms of depression for sex differences in the prevalence of depression in a nationally representative sample of US adults. Although men were likely to endorse many traditional depression symptoms, men were significantly more likely to report symptoms of anger attacks/aggression, irritability, substance abuse, and risk-taking behaviors over symptoms such as withdrawal from friends, sleep problems, and feelings of complaintiveness. These results suggest that relying only on men's disclosure of traditional symptoms could lead to an underdiagnosis of depression in men and that clinicians should consider other clues when assessing depression in men.

This study included 2 measures of depression criteria. Both scales demonstrated acceptable internal consistency. The 2 scales also were highly correlated with each other, as well as with MDE, indicating that they are measuring related constructs. The fact that the 2 scales were more strongly correlated with an established depression construct (MDE) compared with the other disorders provides evidence of construct validity, namely, that these scales measure an alternative expression of depression.

The MSS consists of alternative symptoms suggested by the literature as well as traditional symptoms that are not stereotypically associated with femininity. The MSS found that depression was more prevalent among men than women and more prevalent among men than major depression. Using the MSS, we found that men endorsed some of these male-type symptoms at higher rates than women did, including anger attacks/aggression, substance abuse, and risk-taking behavior. Women endorsed stress, irritability, sleep problems, and loss of interest at significantly higher levels. The loss of interest and sleep items are part of traditional depression criteria, and psychological distress is often perceived as a proxy for depressed mood; therefore, it is not surprising that women endorsed these items at higher rates than men. The fact that irritability was endorsed more by

men than women was somewhat surprising but consistent with the findings of Fava et al²³ that more women than men meet criteria for an irritable-type depression.

The second scale, the GIDS, included traditional depression items as well as the alternative, male-type items from the MSS. The MSS appeared to identify depression in a group of men who disclosed more externalizing symptoms. However, we know that men's experiences of depression are not uniform. For some men, these alternative symptoms would be enough to assess depression, while others would experience the more traditional symptoms of depression. Given that a significant number of women also met our depression case criteria using the MSS indicates that both women and men would benefit from a scale that contains an array of symptoms that better reflect the heterogeneity of the depression experience. Similar to the MSS results, the GIDS identified depression in men more often than when only the traditional *DSM-IV* criteria were used. This rate also was higher than the number of depressed men identified with the MSS. The most important finding was that, when the GIDS was used, men and women met criteria for depression in equal proportions. When alternative symptoms were included in depression case criteria, more male depression cases were identified than when traditional criteria were used, indicating that men experience these symptoms in greater numbers. This finding is similar to the work by Möller-Leimkühler et al,¹⁷ which found that men and women met criteria for depression at similar rates using the GMDS with a clinical in-patient sample.

Despite the significant findings reported in this study, there are noteworthy limitations. First, because this was a secondary data analysis, not all constructs put forth in the literature could be included. For example, others have proposed that depressed men commonly try to mask or ignore their emotional pain by overworking, overexercising, or changing their sexual behavior.²⁴ These symptoms, along with other risky behaviors such as gambling, could not be assessed in the present study. Although a few questions regarding job performance, exercise, and gambling were available owing to the structure of the interview, using them would have resulted in an insufficient sample size. In addition, several of the included constructs were imperfect for this study. For example, the items that assess taking chances and reckless behavior were not put into the context of linking the behavior to an emotional condition. However, these items were still included because they were the best items available. Future studies should include

items that assess the excluded behaviors. Finally, we cannot be confident that all the symptoms assessed in our scale were present during the same time period. Although most of the items came from the screening section of the interview, some items used a lifetime context while others were limited to the past 30 days.

The present study examined sex differences in rates of depression. The 2 new scales were developed using the best proxy items in the NCS-R item bank. Therefore, we are not proposing that these scales be used in future study, rather we hope that these findings provide evidence for future nationally representative assessments of depression to include measures of gender norms as well as expanded item pools.

Future studies may want to include measures of gender in addition to sex because often, when masculinity is measured, the degree of masculinity explains more variance in depression rates than does sex alone.¹⁷ Therefore, future studies trying to understand the differences between men and women in the prevalence of depression should include measures that attempt to understand how masculinity and femininity influence depression rates rather than relying on sex alone as an indicator.

Ultimately, the results of this work have the potential to bring significant advances to the field in terms of the perception and measurement of depression. These findings could lead to important changes in the way depression is conceptualized and measured. Future iterations of this work should build on the findings here to continue to explore the relationship between sex, gender, and depression. Our findings showed that men are willing to endorse the alternative depression symptoms, leading to the elimination of sex differences in the prevalence of depression. The goal of this analysis was to explore whether the ways in which men and women experience depression is different from the way depression currently is identified in community surveys. The current depression criteria may be biased toward detecting symptoms that are more common in women. Our findings, however, highlight that male-type symptoms also are fairly common in women. Gender is likely to play an important role in how men and women conceptualize and experience depression. Therefore, further study is needed to clarify which symptoms truly describe men's experiences of depression. This study suggests that asking about irritability, anger, and substance abuse is important when assessing depression in men and women.

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