Title of the manuscript: Major depression among men and women in the US during the COVID-19 pandemic lockdown

Research article

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Abbreviations

MDE, major depressive episode; CHSS, COVID-19 health status survey; WHO, world health organization; PTSD, posttraumatic stress disorder.

Ethics approval and consent to participate

Informed consent was obtained from participants prior to data collection. Study was approved by the Institutional Review Board of the West Texas A&M University, Texas (Approval number 2020.09.001).

Author contributions

Areen Omary. designed the methodology and collected data, analyzed the data, and wrote the first and final draft of the manuscript.

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Conflict of interest

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Abstract

A multidimensional index that measures the health status of individuals during the COVID-19 pandemic has been developed. The COVID-19 Health Status Scale (CHSS), a combination of previously studied and newly created health status scales, assesses the physical, mental, and social well-being of adults during the COVID-19 pandemic. The current study aimed to examine the differences between men and women in self-reported past major depressive disorder diagnosis during the COVID-19 lockdown in the United States using the CHSS self administered questionnaire. Participants were recruited using convenience sampling performed online through the SurveyMonkey Audience.

The self-administered CHSS questionnaire has been pilot tested in an adult population during the COVID-19 pandemic lockdown in the US. The study sample size included 173 participants aged 18 years and older. Results revealed that almost one-third of the study participants (31.2%) reported being diagnosed with past major depressive disorder, whereas 68.8% reported no past major depressive disorder diagnosis. The results of the estimated coefficients of the logistic regression analysis test showed that men were less likely to report major depression during the COVID-19 lockdown ($\text{Exp (B)} = 0.45$ for men; $p < 0.05$) than women. Although the results showed that almost two thirds of the participants reported no major depression diagnosis during the COVID-19 lockdown, the logistic regression analysis confirmed that the chances of men reporting major depressive disorder diagnosis were lesser than that of women and this difference was statistically significant.

Keywords: Major depression, COVID-19 health status survey, Men, Women

1. Introduction

The COVID-19 pandemic has deleteriously impacted the world and human relationships. Ultimately, the World Health Organization (WHO) (1) declared COVID-19 as a global pandemic in March 2020 and acknowledged its destructive potential. The public health system in the US flagrantly failed to cope with the pandemic, and gradually the US became the leading country in COVID-19 infections and deaths globally. Today, the US has exceeded 33.5 million COVID-19 cases and nearly 600,000 COVID-19 related deaths (2).

Many countries have studied the mental health consequences of COVID-19. Studies have examined the impact of the pandemic on the mental health of adult populations, children, parents, inpatients, outpatients, students, and health workers in a broad range of settings and countries, including but not limited to China, Brazil, Egypt, Chile, Spain, the UK, Italy, Ethiopia, Germany, Ireland, Bangladesh, Malaysia, Croatia, and Iran (3-19) (20, 21).

Many studies confirmed a severe rise of mental health problems worldwide, including psychiatric disorders during the COVID-19 lockdown. A study conducted in China examined the impact of confinement at home on depression, anxiety, and stress and found that more than 50% of the study participants rated the psychological impact of the outbreak as moderate or severe. However, the study did not examine participants with confirmed diagnoses or distinguish between men and women and their risk for major depression (22, 23). Two systematic reviews examined the psychological outcomes during the COVID-19 lockdown, including depression, anxieties, post-traumatic stress disorder (PTSD), and reported the same limitations of including samples mainly from China and none from the US (8, 24, 25). One systematic review study that examined the association between the COVID-19 lockdown and psychiatric complications among patients with psychiatric conditions such as major depression, PTSD, and broad range of anxiety disorders, reported a high level of post traumatic stress symptoms (96.2%) and significantly higher level of depressive

symptoms among participants with pre-existing psychiatric conditions (26). Moreover, participants with pre-existing psychiatric disorders reported worsening of their psychiatric symptoms during the COVID-19 pandemic (26). Furthermore, results revealed that participants expressed lower psychological well-being and a higher level of anxiety and depression than pre-COVID-19, while there were no differences when these symptoms were compared in the initial phase of the outbreak to four weeks later (26). Various factors were associated with a higher risk of psychiatric symptoms and/or low psychological well-being, including female gender, poor-self-related health, and relatives with COVID-19.

A growing body of literature suggests the risk of exacerbated mental well-being in parents who have to deal with remote learning for their children at home (27-31). Emerging international evidence indicates that PTSD and depression symptoms became common in the US general population during the early phase of the pandemic (32, 33). However, since the outbreak of COVID-19, few studies worldwide have explored the differences in depressive symptoms among men and women (34, 35). Furthermore, the studies that examined both genders included populations mostly from Asia and some from Europe, but none from the US.

A group of scholars in the US confirmed that the COVID-19 pandemic posed a threat to population mental health due to increased and prolonged feelings of fear and uncertainty, separation and grief, and disruption to social and economic systems (36). The implementation of nationwide quarantine measures were enacted to curb the transmission of COVID-19. While quarantine can be an effective public health measure (37), it came at significant economic, social, and psychological costs (38) that also exacerbated a mental health crisis in the US (39). Although the pandemic has evolved rapidly, its effects on the general population's mental health and adults with major depression in particular among men and women remains unexplored in the US. There is a gap in research that

examines major depression among men and women during the lockdown period due to the COVID-19 pandemic [40]. The full impact of COVID-19 on men versus women remains uncertain among the US general population (40, 41).

There is a need to examine depression, a significant mental disorder, due to its depleting impact on the general population and its high prevalence in US society. According to the WHO, nearly 264 million people worldwide suffer from major depression (42). In the US, major depression is the leading cause of disability among people aged 15–44 years, with the most years lost to this disability than to any other condition (43, 44). Major depression is also the most common individual disorder among people with suicidal behavior (45-47). In 2018, an estimated 17.7 million (7.2%) of the US adult population aged 18 years and older had at least one major depressive episode (MDE) in the past year, which was higher than the percentages from 2005 to 2016 (48). Ample research has confirmed the robust relationship between depression, suicidal ideation, and suicide attempts, including their impact on one's general health status and mortality (44, 49-54). Nearly one third of the individuals who have serious suicide ideations have major depression (55). As such, the consequences of major depression on mortality and quality of life are severe

A growing body of literature suggests the importance of assessing the relationship between gender and risk for major depression during the COVID-19 pandemic (23, 56-58). Previous research has found that men and women responded differently to the COVID-19 lockdown. Women were more likely to take the pandemic more seriously and comply with the restriction measures (59). Another study conducted in Egypt on the prevalence of depression and other mental health problems during the COVID-19 pandemic found that across the gender line, being female was associated with a high prevalence of severe to very severe depression, anxiety, and stress (60).

It is important to examine the risk for major depression during COVID-19 between men and

women to understand the differences in the impact of COVID-19 on populations with major depression in the US adult population. This can help design tailored major depression treatment plans specifically for the at-risk subgroups. However, till date in the US, there is still a lack of evidence on the risk for major depression among men and women. An in-depth examination of the risk for major depression among the two genders will enable a more precise distinction between them and help guide tailored prevention strategies and effective clinical intervention efforts among the general population of the US. Thus, there is a need to identify the risk chances for major depression among men and women during the COVID-19 lockdown, particularly when major depression prevalence rate continues to rise, making depression a leading cause of disability in the US (43, 44). To fill the gap in the literature, the present research study aimed to examine the chances in men and women to self-report past major depressive disorder diagnosis during the COVID-19 lockdown in the US. It was hypothesized men were less likely to self-report past major depressive disorder diagnosis than women during the COVID-19 lockdown.

2. Method

2.1 Participants

Participants' recruitment and distribution were completed using convenience sampling. Eligibility criteria included a) ≥ 18 years of age; and b) high school education or higher. Participants were recruited online using SurveyMonkey Audience, which enabled anonymous recruitment using the eligibility criteria determined by the researchers.

The sample size included 173 participants, 58 males, and 112 females, and three participants reported no response to the question about sex, and were recorded as missing values. Demographic

data included: sex, race, age, education, marital status, and employment status.

2.2. Measures

A multidimensional index, the COVID-19 Health Status Scale (CHSS), which the first author developed, was used to measure the health status among the adult population in the US during the pandemic.

The goal of developing the CHSS measure was to enhance the understanding of the impact of the COVID-19 pandemic on the health status of the general US adult population. Specifically, the CHSS, a combination of previously studied and newly created health-status scales, was designed to assess adults' physical, emotional, and social well-being during COVID-19 (61-63).

The CHSS questionnaire's reliability was established in a pilot study that tested the tool's reliability among 30 adult participants recruited through social media channels. The measure included 50 multiple-choice items that examined the health status of the adult population in the US during the pandemic. Questions were related to the physical and mental health status during the pandemic, finances, physical and mental health conditions, health behaviors and habits, lifestyle during the lockdown, employment, health insurance, healthcare access, mental health/well-being, time spent with family and friends during the pandemic, availability of psychosocial support networks, coping, and self-care during the COVID-19 pandemic. The questionnaire included a brief study description, an explanation of the study goals, and a consent form that the participants were required to read and sign prior to filling out the questionnaire. The scale produced a Cronbach's alpha of 0.77, thereby confirming its overall reliability and consistency. The survey questionnaire is registered as a patent with the United States Copy Right Office, 2021.

2.3. Study variables

All participants, 18 years and older, with or without past major depression diagnosis were included in the study. The main independent variable, sex, included four categories, male, female, intersex, and I decline to answer. Since only participants aged 18 years and older were included in the study, category participants under the age of 18 were excluded from further analysis.

The main outcome of the study was major depression diagnosis. The outcome was measured by asking the participants a question in the CHSS questionnaire as to whether or not they had an official diagnosis from a list of physical and mental health conditions that included a major depression diagnosis. The question was "Please indicate if you were officially diagnosed in the past with any of the following conditions-check all that apply."

2.4. Procedure

The investigators collected data from eligible participants in December 2020. Based on the eligibility criteria described, the SurveyMonkey Audience sent invitations to eligible people to participate in the study. Participants were informed that they could decline to answer questions for any reason and could accept or decline consent prior to beginning the online survey. Each participant was asked to complete the questionnaire once and were informed that participation was voluntary and that they could refuse participation or exit the survey at any time without any penalty. The consent form also explained that no direct compensation would be offered. The SurveyMonkey system notified the researchers once the quota sample was achieved, and no more questionnaires were distributed or collected.

Responses were anonymously and electronically transmitted to the investigators who then downloaded the responses from the SurveyMonkey system and into the SPSS Statistics version 27

premium program for data analysis. The responses did not include identifiable data about participants, thus maintaining the confidentiality of the data and anonymity of the participants. There were no foreseeable risks of participation other than those encountered in daily life. However, obtained data helped us learn about how COVID-19 affected adults' physical and mental health. The potential risks were addressed as follows: a) distribution was accomplished through SurveyMonkey; b) participant identities remained anonymous, and c) the investigators did not know the identity of participants during the recruitment or data collection stages.

Informed consent for participation in the self-reported questionnaire was completed through Survey Monkey on a separate informed consent page prior to the start of the study. Informed consent included description of the study goals, the type of questions that the survey would ask about, participation eligibility, data confidentiality, voluntary participation, option to opt out at any time during the study without a penalty, that they had not given up any legal rights by signing the consent form, and the contact information of the researchers. The consent form also included an explanation of the data storage of responses. This stated that survey responses were linked on SurveyMonkey.com, where data were stored in a password-protected electronic format. It was also explained that the online survey does not collect identifying data such as names, email addresses, or IP addresses. Thus, participants' responses remained anonymous. To allow participants to demonstrate their understanding of what they read and agreed to do, as well as their understanding of the extent to which their identifiable private information was confidentially stored, the consent form included an explanation about the electronic consent and provided the participant two options: agree or disagree with choosing from prior to the start of participation in the survey. Participants were not able to start the online survey unless they read and signed the online consent form. The appropriate

institutional review board approved of all the study procedures. The study was conducted in accordance with the code of ethics set by the Declaration of Helsinki and all its amendments.

2.5. Statistical analysis

2.5.1. Crosstabulation and correlation analyses

After data were collected, statistical analyses were performed for the dependent variable major depression using IBM SPSS Statistics, version 27.0 premium (SPSS Corp Inc). In order to test the relationship between the various variables, crosstabulation table of the percentages and chi square test for sex and major depression were performed. A significant level of $p \leq 0.05$ and 95% confidence interval was chosen for this study.

2.5.2. Logistic regression analyses

Binary logistic regression analysis was used to examine whether men were less likely to report major depression than women during the COVID-19 pandemic. The binary logistic regression test is a prediction test of likelihood odds that indicates the chances of one event occurring in comparison to other events (64). Since the outcome measure, major depression, was a categorical variable, the binary logistic regression analysis was the appropriate statistical model for estimating the probabilities of its presence or absence. The goodness-of-fit of the model was examined using Pearson and Deviance criteria; the display of statistics that measured the overall model performance was controlled. Wald Statistics, changes in log likelihood, and odds ratios for prediction of major depression were also calculated.

3. Results

A total of 173 participants which including 58 males (33%) and 112 (64.9) females, 0 (0%) intersex, and three missing responses to the question about assigned sex at birth that were coded as missing values, were included in the study. A demographic profile of the participants is presented in the frequency table and includes demographic variables of sex, age, race, marital status, employment status, and health insurance (Table 1).

3.1 Crosstabulation and correlation analyses

Crosstabulation of sex and age group showed that 41.4% of men but only 31.3% of women, were in the 45-54 age group. The smallest percentage of age group among men was 5.2% in the age group of 55-64, whereas the smallest percentage of women was 5.3% in the age group older than 65 years old (Table 2).

Crosstabulation results of sex and self-reported major depression show that almost one third of the study participants (31.2%) reported being diagnosed with major depression, and 68.8% reported no major depression diagnosis (Table 3). Results of the chi square test analysis of sex and major depression confirmed that the relationship between the independent variable sex and the dependent variable major depression was statistically significant ($p < 0.05$; Table 4).

3.2 Logistic regression analyses

In this exploratory cross-sectional study, we hypothesized that men were less likely to self-report a major depressive disorder diagnosis than women during the COVID-19 lockdown.

To measure the likelihood ratios of men and women to report a past major depressive disorder diagnosis, a binary logistic regression analyses were conducted for the sex variable. The results confirmed that sex significantly predicted a lesser likelihood among men over women to self-report

a past major depressive disorder diagnosis during the COVID-19 lockdown, which demonstrated a substantially better fit than the intercept only model ($p < 0.05$) (Table 5).

Table 6 presents the likelihood ratio tests, which are the log likelihoods of the null model and fitted "final" model. The likelihood of the model was used to test whether all predictors' regression coefficients in the model were simultaneously zero and in tests of nested models. The results showed that the independent variable sex significantly predicted the variable outcome major depression among study participants ($p < 0.05$).

The results of the estimated coefficients of the logistic regression analysis test showed that men were less likely to report major depression than women during the COVID-19 lockdown (Exp (B) = 0.45 for men; $p < 0.05$; Table 7).

4. Discussion

The current cross-sectional exploratory research findings confirmed that sex significantly predicted self-reported past major depressive disorder diagnosis. Additionally, it also confirms that during the COVID-19 lockdown, men were less likely than women to self-report a major depressive disorder diagnosis.

These results suggest that sex plays a role in men's willingness to report a major depression diagnosis or remains underdiagnosed for a longer time than women. Various studies that have examined major depression among men in different ethnic groups reported that men tended to report lesser than women (65-68). Men tend to use different coping mechanism with depression such as escaping behaviors, including spending a lot of time at work or on sports, exhibiting physical symptoms, developing problems with alcohol or drug abuse and other risky behaviors, such as

reckless driving, which may mask the problem and keep the mental health issues undetected for a longer period of time. Research suggests that the masking of depression and different help-seeking behaviors among men regarding depression is attributed to gender role beliefs such as having to conform to the ideals of masculinity, such as being strong, successful, self-reliant, in control, and capable, along with an emphasis on avoiding emotions (69, 70). However, depression is also a silent disease. Results from a WHO Collaborative Study on Psychological Problems in General Health Care in 14 countries showed that 42% to 48% of depressed people were not recognized as being "psychiatric cases" by primary care physicians (71).

In our study, it is plausible that men who were either underdiagnosed or had their depression undetected at the start of the COVID-19 outbreak, felt further vulnerable during the COVID-19 lockdown and mandatory stay at home, which may explain the decreased likelihood among men to report major depression to mask the pain. Therefore, lower chances to self-report major depression among men compared to women might put men at greater risk for poor quality of life and suicide (72, 73).

The study had strengths and limitations that must be addressed. The main strength of the study is that the measure developed to examine the adult population health status during COVID-19 pandemic. This was derived from the lack of research on how populational health was affected by the COVID-19 pandemic in the US, especially in the context of physical and mental health functioning among the general population (40). As such, this measure holds significant potential in three main areas. First, the US is facing an unprecedented and sweeping pandemic that threatens both the quality of life and life itself across a broad populational spectrum. It was urgent to enhance our understanding of how COVID-19 affected the general population, which required a rapid investigation of its widespread effects on physical and mental health. Second, knowledge gained from exploring the

relationship between COVID-19 and physical/mental health status will help design new clinical and community interventions tailored to the general population's needs. Any new health and welfare interventions must be evaluated based on their actual impact. Third, a reliable, valid, and practical outcome measure was a priority area for understanding the physical and mental health consequences of COVID-19. Although physical and mental healthcare outcomes can be assessed through a variety of parameters, such as satisfaction and cost, health status is most important (74, 75).

This study, however, has some limitations that must be addressed. First, our study participants were asked to report an official past diagnosis of major depression. It is plausible that adults who did not meet the full diagnostic criteria for major depression in the past did not report major depression even if they had been experiencing depressive symptoms during the COVID-19 lockdown. This may have increased the chances to self-report major depression among men, compared to women during the lockdown. Second, the study survey was a cross-sectional questionnaire; thus, no directionality or causality can be assumed between the study variables. Third, the reliance on self-report itself has limitations, such that it may be prone to misinterpretation, social desirability, and recall bias. Future analyses with the anticipated waves of data collection will enable examining the association of predictors to major depression and other mental health outcomes and adjust for confounders. Fourth, the sample included 173 participants with internet access, knowledge of SurveyMonkey, and 12 years of education or more. Therefore, the study sample included participants from a certain demographic group, certain education level, and those who had internet access or SurveyMonkey technology. Thus, the representativeness of the sample was limited and cannot be treated as representative sample of the US general population. Further studies are required to assess the different demographics and risk for major depression among diverse groups of the US population. Such research will enhance major depression treatment tailored for men and informed theoretical models.

5. Conclusions

This is the first study in the US that predicts the chances for major depression among adult men and women during the COVID-19 lockdown. Clinical attention is required for the male population using tailored, focused interventions that address their unique mental health challenges and needs. Special attention must be paid to men from minority communities, including Black and Hispanic men, who are particularly at risk for suicide (54, 76-78). Future research should examine the mental health outcomes post the COVID-19 pandemic and potential confounders such as comorbid physical conditions, employment during post-COVID-19, availability of supportive networks, rural-urban residency, and income among men and women. It is necessary to research and evaluate the direct neuropsychiatric consequences and the indirect effects on mental health to tailor mental healthcare planning and for preventive measures during potential subsequent pandemics.

Abbreviations

MDE, major depressive episode; CHSS, COVID-19 health status survey; WHO, world health organization; PTSD, posttraumatic stress disorder.

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Tables

Table 1. Frequencies and percentages of the demographic characteristics of the study participants. (N=173)

Demographic characteristic		N	%
Sex	Male	58	33.5
	Female	112	64.7
	Intersex	0	0
	No response	3	1.7
Race	Black or African American	12	6.9
	Hispanic or Latino	18	10.4
	Native American or Native Alaskan	2	1.2
	Hawaiian or other Pacific Islander	1	0.6
	Asian or Asian American	18	10.4
	Two or more races	8	4.6
	Other	3	1.7
	White or Caucasian	110	63.6
	No response	1	0.6
Age	18-24	23	13.3
	25-34	36	20.8
	35-44	25	14.5
	45-54	60	34.7
	55-64	18	10.4

	65+	11	6.4
	No response	0	0
Education level	Less than high school	1	0.6
	Graduated from high school	25	14.5
	Some college education but didn't graduate	54	31.2
	Completed undergraduate school	45	26.0
	Completed graduate school	37	21.4
	Completed post graduate school	10	5.8
	No response	1	0.6
Employment status	Disabled, not able to work	6	3.5
	Employed, working full-time	91	52.6
	Employed, working part-time	19	11
	I was furloughed due to the pandemic	1	0.6
	Not employed because my employer business shut down or reduced due to the pandemic	3	1.7
	Not employed, looking for work	14	8.1
	Not employed, and not looking for work	9	5.2
	Retired	13	7.5
	Self employed	11	6.4
	Student	5	2.9
	No response	1	0.6
Marital status	Divorced	15	8.7

	In a domestic partnership or civil union	7	4.0
	Married	96	55.5
	Separated	5	2.9
	Single, but cohabiting with a significant other	10	5.8
	Single, never married	33	19.1
	Widowed	6	3.5
	No response	1	0.6
Health insurance	Uninsured	14	8.1
	Have both, private and public health insurance	11	6.4
	Private health insurance	93	53.8
	Public health insurance (Medicaid, Medicare, other public health insurance)	44	25.4
	Mutual Health Organization Insurance (HMO)	2	1.2
	Other	5	2.9
	No response	4	2.3

Table 2. Crosstabulation table of sex and age among the study participants.

			18-24	25-34	35-44	45-54	55-64	65+	Total
Sex	Men	Count	4	16	6	24	3	5	58
		% within males	6.9	27.6	10.3	41.4	5.2	8.6	100.0
		% of Total	2.4	9.4	3.5	14.1	1.8	2.9	34.1
	Women	Count	19	20	17	35	15	6	112
		% within females	17.0	17.9	15.2	31.3	13.4	5.4	100.0
		% of Total	11.2	11.8	10.0	20.6	8.8	3.5	65.9
Total	Count	23	36	23	59	18	11	170	
	% of Total	13.5	21.2	13.5	34.7	10.6	6.5	100.0	

Table 3. Crosstabulation table of sex and presence of past major depressive disorder diagnosis during the COVID-19 lockdown in the US among the sample participants.

			With past MDD ^a diagnosis	Without past MDD diagnosis	Total
Sex	Male	Count	12	46	58
		% within males	20.7	79.3	100.0
		% of Total	7.1	27.1	34.1
	Female	Count	41	71	112
		% within females	36.6	63.4	100.0
		% of Total	24.1	41.8	65.9
Total	Count	53	117	170	
	% of Total	31.2	68.8	100.0	

a. MDD: Major Depressive Disorder

Table 4. Chi-Square test of sex and presence of past major depressive disorder diagnosis during the COVID-19 lockdown in the US among the sample participants.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.51 ^a	1	.03		
Continuity Correction ^b	3.80	1	.05		
Likelihood Ratio	4.70	1	.03		
Fisher's Exact Test				.03	.02
N of Valid Cases	170				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.08.

b. Computed only for a 2x2 table

Table 5. Model fitting information of sex predicting past major depressive disorder diagnosis during the COVID-19 lockdown in the US among the sample participants.

Model	Model Fitting Criteria -2 Log Likelihood	Likelihood Ratio Tests		
		Chi-Square	df	Sig.
Intercept Only	13.90			
Final	9.20	4.70	1	.03

Table 6. Likelihood ratio tests table of sex predicting past major depressive disorder diagnosis during the COVID-19 lockdown in the US among sample the participants.

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	Df	Sig.
Intercept	9.20 ^a	.00	0	.
Sex	13.90	4.70	1	.03

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Table 7. Parameter estimates table for self-reported major depression diagnosis predicted by sex during the COVID-19 lockdown among the study participants.

Past MDD ^a Diagnosis ^b		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
Sex								Lower Bound	Upper Bound
Sex	Intercept	-.54	.19	7.83	1	.00			
	Men	-.79	.37	4.39	1	.03	.45	.21	.94
	Women	0 ^c	.	.	0	.	.	.	.

a. MDD: Major Depressive Disorder

b. The reference category is: No Major Depression Diagnosis.

c. This parameter is set to zero because it is redundant.