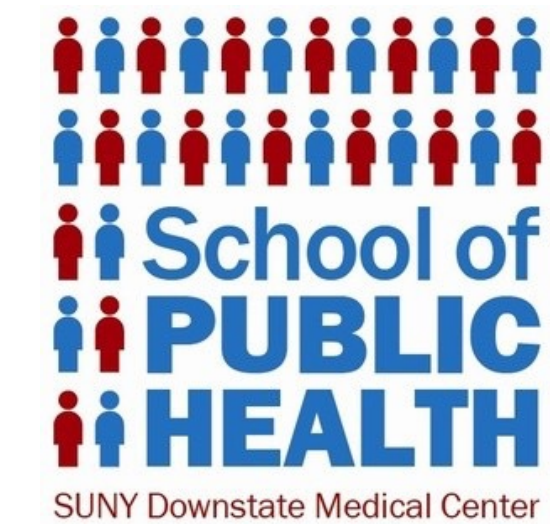




THE ASSOCIATION BETWEEN HEALTH INSURANCE STATUS, PRESCRIPTION DRUG COVERAGE, AND DEPRESSIVE SYMPTOMATOLOGY



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ABSTRACT

Background: Mental illness is an increasing public health concern. One aspect of mental illness is Major Depressive Symptomatology, which has increased in prevalence in the United States and in other developed countries. This study aims to explore possible associations between insurance coverage and depressive symptomatology using nationally representative data from the NHANES 2017-2018 study.

Methods: The Patient Health Questionnaire (PHQ-9) aggregate scores were used to measure depressive symptomatology. Respondents were categorized as Not Depressed, Minimal Depressive, Mild Depressive, or Severe Depressive symptoms based on American Psychological Association recommendations. Associations between health insurance status and prescription drug coverage and the depression outcomes were evaluated using logistic regression.

Results: Health insurance status and subsequent prescription drug coverage were not associated with depressive symptomatology in the NHANES sample that participated in the PHQ-9 section of the NHANES. Non-Hispanic Black and non-Hispanic Asian were found to have lower odds of MDS when they lacked Health Insurance and lacked Prescription Drug coverage, compared to the reference group of non-Hispanic Whites. Women were found to have higher odds of MDD compared to men in both exposure groups.

Discussion and Conclusion: Unlike previous studies, we found no association between health insurance and prescription drug status and depressive symptoms. This may be for the lack of certain other covariates not found in the NHANES data such as current employment. Future studies are needed to evaluate this issue in the NHANES 2019-2020 cycle in the context of the COVID-19 pandemic and its associated lockdowns.

STUDY AIMS AND HYPOTHESIS

- To determine if there is an association between health insurance coverage and depressive symptomatology after adjusting for demographic factors.
- To determine if there is an association between prescription drug coverage and depressive symptomatology after adjusting for demographic factor.

The hypothesis is that lack of insurance coverage and prescription drug coverage will be positively associated with higher depressive symptomatology in the NHANES study.

BACKGROUND

In the United States, there has been an increase in the prevalence of depression among all age groups, but most pronounced in the younger demographics, from 2005 to 2015 (1). From the 2009 to 2012 National Health and Nutrition Examination Survey (NHANES), 7.6% of individuals aged 12 or older had moderate to severe depression while the National Health Interview Survey found that, in 2019, 4.7% of adults aged 18 or older had regular feelings of depression (2, 3).

The lack of adequate insurance coverage and associated prescription drug coverage are sources of stress that may increase the odds of depression (4-11). Adequate insurance coverage may decrease the odds of psychological stress and, subsequently, depression (7, 12). For example, there was significant decrease in severe psychological distress (by about 5%) in low-income parents after Medicaid expansion (13).

Insurance status, and subsequent adequate prescription drug coverage, have both been found to be associated with depression and depression symptomatology. We explore the association between health insurance status and prescription drug coverage on depression symptomatology in the large, nationally representative National Health and Nutrition Examination Survey (NHANES) study.

METHODS

Sample Selection

The data for the current study came from the NHANES cohort of 2017-2018. The sample for the NHANES is based on multi-year, clustered four-stage samples. Within the sample, there was over-sampling of certain subgroups for increased subgroup precision. Groups that were oversampled included Hispanic persons, Non-Hispanic Blacks, Non-Hispanic, non-Black Asian persons, those at or below 185% of the federal poverty level, and those aged 0–11 years or 80 years and over.

METHODS

Inclusion/Exclusion Criteria
6,684 completed the mobile examination center interview (MEC), which was used for sensitive topics such as depression or alcohol use. Only 5,533 individual data for the depression screener were eligible for public use. Of those 5533 individuals, only 4,312 individuals had completed the health insurance and prescription drug survey as well.

9,254 completed the interview

6,684 of the 9,254 completed the mobile examination center interview.

Of the 6,684, only 5,533 had data depression screener data that were publicly available.

Of those 5,533, 4,312 also had data on Health Insurance

Measurement of Exposure

The exposure variables of interest were the presence of healthcare coverage ("Covered by health insurance") and the presence of prescription drug coverage ("Do plans cover prescriptions?"). Response categories were "yes" or "no". Responses of "Refused" or "Don't Know" were recoded as "Missing" for each of the two variables of interest.

Measurement of Outcome

Depression symptomatology assessed using the PHQ-9 and composite scores were used for this analysis. The PHQ-9 was found to have high validity for the diagnosis of Major Depressive Disorder (MDD), but for this project major depression symptomatology will be used as a proxy for MDD. PHQ-9 composite scores were used to categorize depression status. "Depression: Yes or No" was created based on the threshold for depression in the PHQ-9.

Measurement of Covariates

The potential confounders for the study are sex, race, and income level, and age. These covariates were chosen based on review of the literature and univariate analysis. Income level was used as a proxy for employment status due to the unwieldy way employment was investigated for the 2017-2018 NHANES. Furthermore, the median household income (~\$68,000) was used as the reference point to account for the extremes of income.

Statistical Analysis

The analysis was conducted using sample weights as recommended by the CDC. Differences in insurance and prescription drug coverage by demographic factors were compared using chi-square analysis. The associations between insurance status, prescription drug coverage and high depressive symptomatology were investigated using binary logistic regression. Within the logistic regression models, age, sex, race, and income were also investigated due to possible confounding. The point estimate for the odds ratio, 95% confidence interval, and p-values were reported. Unless otherwise stated, the analysis used alpha=0.05. All statistical analysis was done using SAS University Edition.

RESULTS

Demographic Characteristics

The proportion of the distributions among race, sex, age, and income are statistically different between insured and uninsured (all p-values <0.0001), as shown in **Table 1**.

Table 1	Health Insurance		No Health Insurance		P-Value
	N	Weighted N (%)	N	Weighted N (%)	
Total	7676	282703458 (88.2)	1008	37691401 (11.8)	<0.0001
Race					<0.0001
Mexican-American	1028	26459209 (76.5)	262	81117928 (23.5)	
Other Hispanic	635	18839968 (81.0)	137	4407924 (19.0)	
Non-Hispanic White	2693	173396257 (91.4)	238	16321930 (8.6)	
Non-Hispanic Black	1770	32291619 (85.1)	233	5633982 (14.9)	
Non-Hispanic Asian	999	16453632 (91.9)	85	1450924 (8.1)	
Other	551	15262774 (89.7)	53	1758713 (10.3)	
Sex					<0.0001
Male	3719	134463843 (85.9)	543	22153760 (14.1)	
Female	3957	148239615 (90.5)	465	15537641 (9.5)	
Age					<0.0001
18-64	6324	235048897 (86.5)	970	36756381 (13.5)	
65+	1352	47654561 (98.1)	38	935020 (1.9)	
Citizenship Status					<0.0001
Not a Citizen	546	14487506 (60.4)	308	9485566 (39.6)	
Citizen	7122	267988906 (90.6)	681	27716723 (9.4)	
Income					<0.0001
<\$24,999	2133	5750240 (80.3)	415	14092422 (19.7)	
\$25,000-\$54,999	2081	66521201 (85.6)	302	1171813 (14.4)	
\$55,000-74,999	819	31074445 (89.8)	91	3546920 (10.2)	
\$75,000-\$99,999	731	36711216 (93.6)	45	2495869 (6.4)	
>\$100,000	1442	76480967 (97.4)	43	2021054 (2.6)	

Table 2 shows that among the included covariates, all of them except age had a significant difference between showing depressive symptoms or not.

Table 2	Depressive Symptoms		No Depressive Symptoms		P-Value
	N	Weighted N (%)	N	Weighted N (%)	
Total	3150	150073985 (68.6)	1588	68733197 (31.4)	<0.0001
Race					<0.0001
Mexican-American	440	13634052 (65.2)	256	7285359 (34.8)	
Other Hispanic	316	10964009 (69.5)	143	4813146 (30.5)	
Non-Hispanic White	1275	100777093 (69.0)	517	45233711 (31.0)	
Non-Hispanic Black	745	16964499 (65.6)	431	8886627 (34.4)	
Non-Hispanic Asian	367	6790515 (54.9)	308	5572486 (45.1)	
Other	204	8911877 (80.3)	66	2181876 (19.7)	
Sex					<0.0001
Male	1467	68652246 (60.9)	991	44028413 (39.1)	
Female	1860	89389798 (74.9)	730	29944791 (25.1)	
Age					0.13
18-64	2562	129107887 (69.0)	1269	58086435 (31.0)	
65+	785	28934157 (64.6)	452	15886770 (35.4)	
Citizenship Status					0.01
Not a Citizen	399	12180069 (62.8)	248	7203667 (37.2)	
Citizen	2939	145525217 (68.6)	1467	66647502 (31.4)	
Income					0.01
<\$24,999	1127	38547769 (74.9)	423	38547769 (25.1)	
\$25,000-\$54,999	908	38963402 (69.5)	469	17130362 (30.5)	
\$55,000-74,999	336	17831604 (70.1)	174	7606156 (29.9)	
\$75,000-\$99,999	269	18718860 (65.9)	173	9693235 (34.1)	
>\$100,000	510	36012350 (62.8)	349	21377503 (37.2)	

RESULTS

Associations between Health Insurance Status, Prescription Drug Coverage and Depressive Symptomatology

Surprisingly, insurance status and prescription drug coverage were not associated with high depressive symptomatology in either the crude or adjusted logistic regression models (**Table 3**; **Table 4** not shown).

TABLE 3	Odds Ratio (95% CI)	P-value
No Health Insurance (Crude)	1.148 (0.918, 1.437)	0.2078
No Health Insurance (adjusted)	1.083 (0.830, 1.413)	0.5943
Covariates in Adjusted Model		
Race		
Non-Hispanic White	1 (ref)	ref
Mexican-American	0.753 (0.619, 0.917)	0.0078
Other Hispanic	0.886 (0.630, 1.246)	0.4595
Non-Hispanic Black	0.703 (0.592, 0.835)	0.0005
Non-Hispanic Asian	0.517 (0.402, 0.665)	<0.0001
Other	1.664 (0.964, 2.873)	0.0653
Sex		
Male	1 (ref)	ref
Female	1.985 (1.636, 2.408)	<0.0001
Age		
<64	1 (ref)	ref
65+	0.755 (0.576, 0.988)	0.0417
Income		
\$55,000-74,999	1 (ref)	Ref
<\$24,999	1.287 (0.905, 1.831)	0.1476
\$25,000-\$54,999	0.985 (0.702, 1.382)	0.9254
\$75,000-\$99,999	0.843 (0.503, 1.414)	0.4933
>\$100,000	0.716 (0.441, 1.162)	0.1621

DISCUSSION/CONCLUSION

- Chi-Square analysis showed significant differences based on race, age, sex, citizenship status, and income of those that have or do not have health insurance.
- Similarly, Chi-Square analysis showed significant differences based on race, sex, and citizenship status of those with depressive symptoms or not. There was no difference based on age.
- Neither the crude or adjusted models showed any significant associations between health insurance status and depressive symptomatology. The same held true when prescription drug coverage was the exposure.
- Similar findings through proportional hazards model analysis.

Further research of health insurance and its effect on depressive symptomatology is warranted, especially in the current pandemic. Furthermore, exploration of health insurance status and its effect on other mental health issues, such as anxiety is warranted (14).

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