

Is mental health related to ethnicity/race and income in middle-aged females in the general U.S. population?

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Abstract

Purpose: With little research addressing mental health, ethnicity/race, and income within specific gender and age groups, the purpose of this study was to examine whether mental health differs by ethnicity/race and income in middle-aged women in the general population.

Methods: This cross-sectional analysis used 2016 Behavioral Risk Factor Surveillance System data for females ages 40–64 years from Alabama (N=1455), Mississippi (N=1082), North Carolina (N=1215), South Carolina (N=2277), and Tennessee (N=1263). Ordered logistic regression analysis by state was used to assess the relationship between mental health and ethnicity/race and income, while controlling for demographic and health factors.

Results: Over one-third of middle-aged women reported having low to moderate mental health (38–45%), half or more reported white race (54–81%), and more than half reported an income of less than \$50,000 per year (52–66%). The results of this study indicated that mental health did not differ significantly by income, but did differ significantly by ethnicity in 3 of 5 states, with white, non-Hispanic middle-aged women reporting more mental health issues. In addition, mental health was related to physical health, tobacco use, and age categories across states.

Conclusion: Overall, mental health differed by ethnicity/race, but not by income, across samples of middle-aged women in the general population. Limitations of this study include an underrepresentation of various ethnicity/race groups. Because over one-third of this target population may have low to moderate mental health, practitioners in a primary care should screen all middle-aged women for mental health, with special consideration for white patients and those 40–55 years of age. In addition, because tobacco use and physical health were moderately- to highly-related to mental health in this target population, practitioners should screen for all if middle-aged females present with any. Any treatment for mental and physical health issues should be coordinated and smoking cessation should be encouraged.

Introduction

Poor mental health is a global issue that leads to more disability worldwide than any other disease (CDC, 2011a). In the United States, over 50% of adults will suffer from at least one mental illness over the course of their lifetime [1]. Research has consistently linked poor mental health with poor physical health, substance abuse, and a variety of other chronic health issues, such as obesity and cardiovascular disease [1–4]. Poor mental health is not just a concern at the individual or family level, but also provides a significant financial burden to society. It has been calculated that people with poor mental health have higher healthcare costs, with the financial burden to the United States being approximately \$300 billion [1,2,4].

Research shows that mental health differs by gender, ethnicity/race, and socioeconomic status. Studies have indicated that women are more likely to suffer from mental illness than men [4–9], with the average onset of mental illness in women being between the ages 26–32 [3]. In addition, studies show that African American and Hispanic women are more likely than Caucasian women to have depressive symptoms [10–11]. Studies have also shown a significant relationship between income inequality and poor mental health in the general population [8].

While previous research has shown a relationship between mental health and both ethnicity/race and income, the majority of that research was conducted in specific populations, including veteran women, menopausal women, women with gestational diabetes mellitus, women who spent time in foster care [9–12]. Few studies have assessed this relationship in general populations or by specific age and

gender groups. Therefore, the purpose of this study is to examine the relationship between mental health and both income and ethnicity in middle-aged women in the general population.

Methods

Design

This cross-sectional analysis used 2016 data from the Behavioral Risk Factor Surveillance System (BRFSS) conducted by the Center for Disease Control and Prevention (CDC) [13]. The goal of BRFSS is to collect uniform data on health risk behaviors, chronic diseases, health conditions, access to health care, and use of preventative health services linked to the leading causes of death and disability in the United States and U.S. territories. State health departments conduct standardized surveys annually using Random Digit Dialing (RDD) techniques. Participants include adults 18 years who are not monetarily compensated. The CDC compiles all BRFSS data and makes de-identified data available to researchers for secondary data analysis. This study was given exempt status by the Institutional Review Board of The University of North Texas Health Science Center.

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Sample

The samples for this analysis included females ages 40-64 years in Alabama (N=1455), Mississippi (N=1082), North Carolina (N=1215), South Carolina (N=2277), and Tennessee (N=1263). These states were chosen for their higher proportions of individuals who reported (a) depression and (b) being middle-aged females based on the BRFSS 2016 prevalence survey data maps [14].

Data

Our outcome of interest was mental health status. Originally, mental health status was measured in BRFSS as participants rating the number of “not good” days during the last 30 days including “stress, depression, and problems with emotions” with the number categorized as “low” (0 days), “moderate” (1-13 days), or “high” (14 or more days). For convenience and clarity, we reversed this variable to be a measure of days of “good mental health status” with categories of “low” (less than 16 days), “moderate” (17-29 days), or “high” (30 days). We had two factors of interest, ethnicity/race and income. Ethnicity/race in the BRFSS data was initially categorized as “white, non-Hispanic,” “black, non-Hispanic,” “Hispanic,” “other race, non-Hispanic,” or “multiracial, non-Hispanic.” However, due to small percentages in some categories, we used 3 categories: “white, non-Hispanic,” “black, non-Hispanic,” or “other.” Income was measured as having an income level of “0 to less than \$25,000,” “\$25,000 to less than \$50,000,” or “\$50,000 or more.”

The control variables were age, marital status, education level, employment status, physical health status, tobacco use, and alcohol use. Age was categorized as “40-44,” “45-49,” “50-54,” “55-59,” or “60-64.” Marital status was categorized as “yes” or “no” to being currently married. Education level was categorized as “graduated from college/technical school” or “did not graduate college/technical school.” Employment status was categorized as “employed” or “not employed.” Physical health status was reversed from “not good” to “good” days of physical health in the past 30 days and categorized as “low” (less than 16 days), “moderate” (17-29 days) or “high” (30 days). Tobacco use was measured as “current smoker” or “non-smoker.” Alcohol use was measured as “none” (no use), “light” (less than 1), “moderate” (1-3), or “excessive” (4 or more) for average number of drinks per day [15]. The categories and responses for each variable are listed in Table 1.

Analysis

Frequency distributions were used to assess sample characteristics and to identify any issues with the distribution of variables. Data analysis was conducted separately by state to determine patterns among variable relations across similar samples. Similar results in 3 or more of 5 states were considered consistent evidence for relations. Ordered logistic regression by state was used to assess the relationship between mental health status and both ethnicity/race and income level after controlling for age, marital status, education level, employment status, physical health status, tobacco use, and alcohol use. An ordered logistic regression model is used to estimate a relationship between an ordinal dependent variable and a set of independent variables. The proportional odds produced for each IV relates “proportionally” or equally applies to comparisons of DV groups greater than k versus those who are in groups less than or equal to k , where k is any level of the response variable. Therefore, the interpretation of an associated OR is that for a one unit change in the predictor variable, the odds for a group that is greater than k versus less than or equal to k are the proportional odds times larger. The adjusted results for mental health outcomes are shown

in Table 2. Any observations with missing data for any variables were excluded from the adjusted analysis. All analyses were conducted in STATA 15 (©1985-2017 Statcorp LLC).

Results

Descriptive

Table 1 lists participant characteristics for females ages 40-64 in Alabama, Mississippi, North Carolina, South Carolina, and Tennessee. Across states, over one-third of participants reported low (17-21%) or moderate (22-27%) mental health in the last 30 days. For ethnicity, the majority reported their race as white (54-81%). For income, more than half reported having an income of less than \$50,000 per year (52-66%). For demographic factors, about half of women reported their age as 55-64 (44-51%) and about half reported being unmarried (43-52%). For socioeconomic status, about one third reported graduating college or technical school (21-31%) and the majority reported being employed (53-61%). For health-related factors, the majority reported high physical health in last 30 days (51-61%), most reported not smoking (75-81%), and more than half reported no alcohol use (54-68%).

Adjusted

As shown in Table 2, the results of ordered logistic regression analysis for middle aged females in Alabama, North Carolina, South Carolina, and Tennessee indicated that after controlling for all other variables in the model, mental health was significantly and consistently related to ethnicity/race. In 3 out of 5 states, black women were about 1.5 times more likely to report each successive level of mental health compared to white, non-Hispanic women. In addition, compared to their referent groups, the following participants in at least 3 out of 5 states were more likely to report each successive level of mental health: those who were 55-59 years old, those who were 60-64 years old, those who reported moderate physical health in the last 30 days, and those who reported high physical health in the last 30 days. In contrast, current smokers in 4 out of 5 states were less likely to report each successive level of mental health compared to non-smokers.

Discussion

The purpose of this study was to examine whether mental health differs by ethnicity/race and income in middle-aged women in the general population. To the best of our knowledge, this is the first study to focus solely on this target population. The results of adjusted statistics showed that mental health in middle-aged women differed significantly by ethnicity/race. In our study, black women were more likely to report each successive level of mental health compared to white women. However, our findings differ from previous research that indicate that black women are more likely to show depressive symptoms compared to other ethnicities/races [10,11]. The differences may be attributable to the special populations assessed in prior studies, including veteran women, menopausal women, and women with gestational diabetes mellitus. Furthermore, our research found no consistent relationship between mental health and income, which is similar to the results of a previous review study [8] that showed that only 1 of 9 studies showed consistent associations between income inequality and poor mental health, while the others showed mixed results or no associations.

In addition, our study showed consistent findings for older participants (ages 55-59 and 60-64) to be more likely to report each successive level of mental health when compared to the younger

Table 1. Participant characteristics by state

Variables	Alabama		Mississippi		North Carolina		South Carolina		Tennessee	
	N=1,455		N=1,082		N=1,215		N=2,277		N=1,263	
	N	%	N	%	N	%	N	%	N	%
Mental Health Status	1455	100	1082	100	1215	100	2277	100	1263	100
High	804	55	642	59	749	62	1301	57	705	56
Moderate	392	27	251	23	263	22	571	25	296	23
Low	259	18	189	17	203	17	405	18	262	21
Ethnicity/Race	1442	99	1073	99	1205	99	2229	98	1255	99
White, non-Hispanic	939	65	576	54	815	68	1356	61	1018	81
Black, non-Hispanic	436	30	475	44	266	22	741	33	184	15
Other	67	5	22	2	124	10	132	6	53	4
Income Level	1455	100	1082	100	1215	100	2277	100	1263	100
0 to <\$25,000	523	36	449	42	352	29	760	33	411	33
\$25,000 to <\$50,000	306	21	269	25	281	23	521	23	328	26
\$50,000+	626	43	364	34	582	48	996	44	524	41
Age	1455	100	1082	100	1215	100	2277	100	1263	100
40-44 years old	236	16	165	15	188	15	256	11	156	12
45-49 years old	220	15	196	18	221	18	355	16	245	19
50-54 years old	329	23	199	18	269	22	506	22	274	22
55-59 years old	331	23	245	23	269	22	531	23	257	20
60-64 years old	339	23	277	26	268	22	629	28	331	26
Marital Status	1455	100	1082	100	1215	100	2277	100	1263	100
Married	793	55	524	48	675	56	1239	54	721	57
Unmarried	662	45	558	52	540	44	1038	46	542	43
Educational Level	1454	100	1082	100	1215	100	2277	100	1261	100
Graduated college/technical school	444	31	334	31	505	21	622	27	395	31
Did not graduate college/technical school	992	68	748	69	710	58	1490	65	849	67
Employment Status	1451	100	1081	100	1214	100	2270	100	1260	100
Employed	765	53	584	54	735	61	1279	56	711	56
Unemployed	686	47	497	46	479	39	991	44	549	44
Physical Health Status	1438	99	1059	98	1207	99	2238	98	1241	98
High	745	52	617	58	735	61	1257	56	637	51
Moderate	397	28	253	24	263	22	560	25	332	27
Low	296	21	189	18	209	17	421	19	272	22
Tobacco Use	1425	98	1059	98	1204	99	2237	98	1224	97
Current Smoker	281	20	211	20	233	19	420	19	310	25
Non-smoker	1144	80	848	80	971	81	1817	81	914	75
Alcohol Use	1417	97	1057	98	1178	97	2216	97	1232	98
None	886	63	718	68	640	54	1218	55	760	62
Light	210	15	150	14	161	14	298	13	162	13
Moderate	175	12	81	8	155	13	351	16	157	13
Excessive	146	10	108	10	222	19	349	16	153	12

participants (ages 40-44). Such results may be related to the variation in lifestyles, socioeconomic factors, and/or stressors that each age group may experience. Our study also showed that women who reported moderate or high physical health were more likely to report each successive level of mental health, which is similar to findings of prior research [1,4]. Furthermore, our study showed that smokers were less likely to report each successive level of mental health, which is consistent with previous research in other populations [1-4].

Limitations

The use of BRFSS data provided large representative samples in which to assess variable relations. However, particular ethnicities/races were not well-represented among our sample. Future studies should assess relations between mental health and income within various ethnicity/race groups to determine whether patterns or relations are similar. In addition, for mental health we had no information on symptom severity or management strategies, including medication use,

and it would have been beneficial to have information on participants' social support and current stressors, which may also affect mental health [10]. Future research should include health management, stress, and social support as related to mental health in various age and ethnicity/race groups among middle-aged women.

Recommendations

The results of this population-based study may be generalizable to middle-aged women ages 40-64 in a primary care setting. Within this target population, practitioners may expect a moderate proportion of women with low to moderate mental health. Thus, practitioners should screen mental health in all women ages 40-64, especially white women and the younger ages of this target population. Practitioners may also expect a moderate proportion of women with low to moderate physical health in this target population. Because physical health was highly related to mental health, providers should screen for any comorbid health conditions to determine symptom severity and management

Table 2. Results of ordered logistic regression analysis

Predicting Mental Health (high vs. moderate vs. low)	Alabama			Mississippi			North Carolina			South Carolina			Tennessee		
	AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI	
		Low	High		Low	High		Low	High		Low	High		Low	High
Ethnicity/Race															
White, non-Hispanic	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
Black, non-Hispanic	1.44	1.09	1.89	1.29	0.96	1.73	1.53	1.11	2.11	1.49	1.20	1.85	1.17	0.82	1.68
Other	0.84	0.50	1.40	2.01	0.72	5.61	1.35	0.87	2.10	1.34	0.90	2.01	1.01	0.57	1.79
Income Level															
\$0 to <\$25,000	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
\$25,000 to <\$50,000	1.55	1.12	2.15	0.90	0.64	1.29	0.80	0.56	1.15	1.53	1.17	1.99	1.27	0.89	1.82
\$50,000+	1.37	0.96	1.96	1.16	0.76	1.75	0.99	0.67	1.46	1.54	1.15	2.06	1.63	1.10	2.43
Age															
40-44 years old	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
45-49 years old	0.94	0.64	1.40	1.07	0.70	1.65	1.26	0.82	1.92	1.24	0.88	1.73	1.24	0.81	1.90
50-54 years old	1.20	0.83	1.72	1.55	1.00	2.41	1.02	0.68	1.52	1.35	0.98	1.84	1.35	0.89	2.07
55-59 years old	1.16	0.80	1.66	1.69	1.11	2.58	1.20	0.80	1.81	1.55	1.13	2.13	1.76	1.14	2.72
60-64 years old	1.73	1.19	2.52	1.96	1.28	2.98	1.73	1.13	2.64	2.05	1.49	2.82	2.49	1.63	3.80
Marital Status															
Unmarried	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
Married	1.21	0.92	1.60	1.38	1.02	1.87	1.53	1.15	2.04	1.35	1.10	1.66	1.25	0.93	1.66
Educational Level															
Did not graduate college/technical school	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
Graduated college/technical school	1.36	1.04	1.79	1.24	0.90	1.71	1.04	0.78	1.38	1.01	0.81	1.25	0.88	0.65	1.18
Employment Status															
Unemployed	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
Employed	1.25	0.97	1.63	1.73	1.28	2.34	1.43	1.07	1.91	1.11	0.90	1.37	1.34	1.01	1.77
Physical Health Status															
Low	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
Moderate	1.76	2.01	3.80	2.36	1.60	3.50	2.38	1.63	3.46	3.20	2.44	4.21	2.92	2.07	4.14
High	8.01	5.80	11.06	6.50	4.42	9.55	8.02	5.59	11.50	8.69	6.59	11.35	8.00	5.62	11.38
Tobacco Use															
Non-smoker	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
Current smoker	0.55	0.41	0.73	0.84	0.60	1.18	0.53	0.38	0.72	0.70	0.55	0.89	0.68	0.51	0.90
Alcohol Use															
None	ref	-	-	ref	-	-	ref	-	-	ref	-	-	ref	-	-
Light	0.69	0.50	0.94	1.01	0.69	1.49	0.94	0.65	1.37	0.77	0.59	1.01	0.83	0.58	1.19
Moderate	0.85	0.59	1.20	0.68	0.41	1.12	0.88	0.60	1.29	0.98	0.75	1.28	1.12	0.77	1.64
Excessive	0.76	0.51	1.13	0.54	0.35	0.85	1.00	0.70	1.41	0.66	0.50	0.86	0.69	0.46	1.04

Note. AOR: Adjusted Odds Ratio, 95% CI: 95% Confidence Intervals, ref: Referent Group, boldface indicates significance (AORs with 95% CI that do not include 1.00 are significant)

strategies, and provide education and coordinated treatment as needed. In addition, providers might expect a low proportion of middle-aged women to smoke, but given its moderate relations with mental health, providers should screen for both in patients who present with either. Patient education and smoking cessation resources should be provided.

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