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# Does Mental Health Differ by Ethnicity/Race in Post-Myocardial Infarction (MI) Females Ages 50 Years and Older?

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## Abstract

**Purpose:** There is limited research surrounding how mental health in post-myocardial infarction (MI) patients differs by gender and ethnicity. Therefore, the purpose of this study was to determine whether mental health differs by ethnicity in post-MI older adult females with coronary artery disease (CAD).

**Methods:** This cross-sectional analysis used 2015 BRFSS data for post-MI females 50 years of age and older from Arkansas, Kentucky, and Tennessee. Multiple logistic regression analysis was used to assess the relationship between mental health and ethnicity/race while controlling for age, education level, income level, marital status, physical activity, and depression.

**Results:** About half of post-MI older adult females reported good mental health in the last month (56-58%) and most were White, non-Hispanic (73-80%), followed by Black, non-Hispanic (15-17%), and other ethnic/racial groups (4-11%). The results of this study indicated that mental health did not differ significantly by ethnicity/race in any of the three states after controlling for demographic factors, physical activity, and depression. However, good mental health was inversely related to depression in all three states and positively related to age in two of three states.

**Conclusion:** Mental health did not differ significantly by ethnicity/race in post-MI older adult females. However, within this target population, good mental health was less likely in those with a previous diagnosis of depression in all three states and more likely in those aged 65 and older in two of three states. Although there was no information in this study regarding mental health progression following a myocardial infarction, primary care providers and cardiologists should screen all post-MI female patients, despite their ethnicity/race, for good mental health, especially those who have a previous diagnosis of depression and those ages 50-64 years. Mental health education and referrals should be provided to post-MI older adult females of all ethnicities as needed.

**Keywords:** Myocardial infarction; Heart disease; Mental health; Depression; Ethnicity; Race; Older adults

## Introduction

There has been heightened attention on mental health in persons with coronary artery disease (CAD) in relation to post-myocardial infarction (MI) prognosis due to its substantial personal and financial implications. Heart disease is ranked as the leading cause of death and disability in men and women in the United States [1,2]. Once considered only a man's disease, CAD is now widely recognized to have an impact on the overall health of women as well. It is responsible for approximately 1 in 4 female deaths across all ethnicities [1]. However, CAD presents later in life in women, at an average age of 63.7 years [3] and women with CAD experience poorer prognoses, poorer mental health, and a two-fold higher early mortality rate [4].

In the progression of CAD, myocardial infarction has a serious impact on physical and mental health. Approximately 1 out of 3 patients hospitalized for acute myocardial infarction (MI) have at least mild-to-moderate symptoms of depression [5]. Not only are depressive symptoms related to poor mental health, but poor mental health has been associated with less adherence to recommended therapy as well as a fourfold increase in mortality after six months post-MI [2]. Accordingly, current clinical recommendations by the American Academy of Family Physicians (AAFP) suggest that all persons post-MI is screened for depressive symptoms, especially those over 65 years old [6]. Overall, post-MI poor mental health contributes to persisting cardiovascular issues, adverse health outcomes, and decreased quality of life [5,7].

Studies show mental health manifests differently based on a variety of factors such as income level, marital status, education level, physical activity, depression, and the number of comorbid conditions [4,8]. Specifically, these factors are more likely to be present in older women with CAD and greatly impact their psychosocial wellbeing [4]. Studies indicate that after experiencing a trauma like MI, patients often feel physically disabled and have doubts about their physical recovery, increasing their risk for depression [2].

Although numerous factors have shown a link to post-MI depression, there are several areas that require further study. Research indicates that CAD is a prevalent health risk for women across all ethnicities [4]. Yet, most studies either did not separate multivariate analysis out by race and ethnicity, or included participants in which the majorities were often both male and White [3,5,7]. Although studies may focus on older, Caucasian males because of their increased incidence of heart disease and MI [2], research indicates there may be significant differences in depressive symptoms for Caucasian, African American, and Latino male and female patients over 50 years old [9]. Overall, there is limited information regarding the relationship between post-MI depression and ethnicities other than White, non-Hispanic [9].

Understanding the impact of mental health on post-MI life may be the key to improving overall health outcomes [6]. Unfortunately, the relationship between ethnicity of post-MI females and mental health is underrepresented in the current research. Understanding this relationship would allow providers to better screen for and treat mental health issues, and addressing this relationship could increase treatment compliance and ultimately improve post-MI prognosis and quality of life. Therefore, the purpose of this study was to assess the relations between mental health and ethnicity/race in post-MI older adult females.

## Methods

### Design

This cross-sectional analysis used 2015 data from the Behavioral Risk Factor Surveillance System (BRFSS) conducted by the CDC [10]. BRFSS is an annual, nationwide health-related survey involving over 400,000 telephone participants using random digit dialing techniques. The BRFSS data gathered is used to assess health, health behaviors, and health prevention among adults in the 50 states and four territories. This study was given exempt status by the University of North Texas Health Science Center.

### Sample

The sample contains post-MI females 50 years of age and older in Arkansas (N=233), Kentucky (N=308), and Tennessee (N=203). These states were chosen for their higher rates of coronary artery disease (CAD) [1].

### Data

The outcome was good mental health. This was derived from a BRFSS variable measured by participant rating of their mental health, including "stress, depression, and problems with emotions" in the last month. Because responses were severely skewed (i.e., the values for the median, 3rd quartile, and mode in Arkansas, Kentucky, and Tennessee were 30 days), we

dichotomized good mental health as "yes" (30 days) and "no" (less than 30 days). The factor of interest, ethnicity/race, was measured by self-report. The percentages were small in most of the 8 categories (Table 1) so we collapsed the original 8 categories into 3 categories for analysis: "White, non-Hispanic," "Black, non-Hispanic," and "other."

The control variables were age, education level, income level, marital status, physical activity, and depression. Age was measured as "50-64," "65-79," and "80 and older." Education level was measured as "did not graduate high school," "graduated high school," and "attended or graduated college or technical school." Annual income level was measured as "\$0 to less than \$25,000" and "\$25,000 or more." Marital status was categorized as "married" and "not married." Physical activity was measured as "inactive or insufficiently active" and "active or highly active."

For depression, respondents answered "yes" or "no" to the BRFSS question, "Have you ever been told that you have a depressive disorder, including depression, major depression, dysthymia, or minor depression?" The yes or no responses were labeled as "ever diagnosed" vs. "never diagnosed." All variables and categories, including original ethnicity/race categories, are listed in Table 1, and recoded ethnicity/race categories and analysis results are shown in Table 2.

### Analysis

Frequency distributions by state were used to describe the samples and determine any issues with the distributions of variables. We chose to use data separately from multiple states to assess patterns in relationships among variables of interest in similar samples. Multiple logistic regression analysis by state was used to assess the relationship between mental health and ethnicity/race after controlling for demographic factors, physical activity, and depression.

Any observation with missing data for any variable in the model was excluded from the adjusted analysis. All analyses were conducted in R © 2017 The R Foundation for Statistical Computing).

## Results

### Descriptive statistics

As shown in Table 1, the samples of post-MI females consisted mostly of White, non-Hispanic females (73-80%), with lower percentages reporting Black, non-Hispanic (15-17%) and other categories (8-21%). Across states, about one-third were ages 50-64 (26-39%), more than one-third were ages 65-79, and less than one-third were ages 80 years and older (13-26%). The majority of participants did not attend or graduate college or technical school (57-70%), reported an annual income of less than \$25,000 (65-66%), and were not married (61-75%). The majority also reported being inactive or insufficiently active

(66-69%) and never being diagnosed with any form of depression or dysthymia (62-68%).

**Table 1:** Sample characteristics for post-MI females by state.

Variable	Kentucky (N=308)		Arkansas (N=233)		Tennessee (N=203)	
	N	%	N	%	N	%
<b>Good Mental Health</b>						
Yes	170	58	122	56	112	58
No	124	42	96	44	82	42
<b>Total</b>	294	95	218	93	194	95
<b>Ethnicity/Race</b>	301	97	225	96	199	98
White, Non-Hispanic	241	80	165	73	160	80
Black, Non-Hispanic	46	15	38	17	32	16
American Indian/Alaskan Native	2	1	8	4	5	3
Asian, Non-Hispanic	0	0	0	0	0	0
Native Hawaiian/Pacific Islander	0	0	0	0	0	0
Other Race, Non-Hispanic	1	0	2	1	0	0
Multiracial, Non-Hispanic	8	3	8	4	2	1
Hispanic	3	1	4	2	0	0
Other	14	5	22	10	7	4
<b>Age</b>						
50-64	109	35	61	26	80	39
65-79	160	52	112	48	78	38
80 and older	39	13	60	26	45	22
<b>Total</b>	308	100	233	100	203	100
<b>Education Level</b>						
Did not graduate high school	49	16	52	23	49	24
Graduated high school	122	40	109	47	66	33
Attended or graduated college or technical school	136	44	70	30	86	43
<b>Total</b>	307	99	231	99	201	99
<b>Income Level</b>						
0 to <\$25,000	123	65	103	66	95	65
\$25,000 or more	65	35	53	34	51	35
<b>Total</b>	188	61	156	66	146	71
<b>Marital Status</b>						
Married	120	39	59	25	63	31
Not married	186	61	174	75	139	69
<b>Total</b>	306	99	233	100	202	99
<b>Physical Activity</b>						
Inactive or insufficiently active	181	69	126	66	110	66
Active or highly active	80	31	64	34	56	34

Total						
<b>Depression</b>	308	100	231	99	202	99
Ever diagnosed	99	32	78	34	76	38
Never diagnosed	209	68	153	66	126	62
<b>Total</b>	261	84	190	81	166	81

### Adjusted statistics

As shown in Table 2, the results of multiple logistic regression analysis for post-MI older adult females conducted separately by state indicated that after controlling for other variables in the model, mental health was not significantly related to ethnicity/race in any of the three states. However, in all three states, those

ever diagnosed with depression or dysthymia were about 5 to 8 times less likely to report good mental health compared to those never diagnosed. In addition, older participants were about 3 to 10 times more likely to report good mental health in two of the three states.

**Table 2:** Results of Multiple Logistic Regression Analysis by State.

Good Mental Health (yes versus no)	Kentucky			Arkansas			Tennessee		
	AOR	95% CI		AOR	95% CI		AOR	95% CI	
		Low	High		Low	High		Low	High
<b>Ethnicity/Race</b>									
White, Non-Hispanic	ref	-	-	ref	-	-	ref	-	-
Black, Non-Hispanic	0.93	0.29	2.95	1.44	0.35	5.92	1.07	0.3	3.76
Other	1.36	0.17	10.9	0.63	0.13	3.05	0.74	0.04	14.8
<b>Age</b>									
50-64	ref	-	-	ref	-	-	ref	-	-
65-79	3.4	1.52	7.57	9.65	2.8	33.3	2.13	0.81	5.56
80+	8.3	1.68	40.9	9.08	2.12	38.9	1.85	0.44	7.69
<b>Education Level</b>									
Did not graduate high school	ref	-	-	ref	-	-	ref	-	-
Graduated high school	0.53	0.17	1.65	2.53	0.6	10.7	2.01	0.58	7.02
Attended/graduated college/technical school	0.38	0.11	1.34	2.45	0.54	11.2	3.4	0.95	12.1
<b>Income Level</b>									
\$25,000 or more	2.47	0.88	6.98	0.63	0.19	2.09	1.9	0.71	5.13
<b>Marital Status</b>									
Married	1.75	0.72	4.25	2.39	0.7	8.16	0.77	0.27	2.2
<b>Physical Activity</b>									
Active or highly active	1.94	0.84	4.49	2.72	0.9	8.21	1.76	0.67	4.6
<b>Depression</b>									
Ever diagnosed	0.2	0.09	0.46	0.12	0.04	0.33	0.12	0.04	0.31

**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).

## Discussion

The purpose of this study was to determine whether mental health differs by ethnicity/race in post-MI older adult females.

To the best of our knowledge, this is the first study known to do so. In adjusted analysis, mental health did not differ significantly by ethnicity/race. However, across all states, women with a past medical history of depression were less likely to report good

mental health, which is consistent with previous research findings [7]. In addition, in two of three states, participants age 65 or older were more likely to report good mental health compared to those age 50-64 years old. This finding is noteworthy because it contradicts current recommendations from the American Academy of Family Physicians (AAFP) to screen all persons post-MI for depression, especially those over age 65 [6,11,12]. This anomaly may be a result of differential cognitive functioning. As people age, they may not remember as much about their short-term history; thus, middle-aged females may have better cognitive awareness of their quality of life, which affected how they responded to the survey. However, it could also be a result of developmental changes in which older adults must come to terms with their own mental and physical decline. Older adults may have had more time to adjust to the aftermath of a myocardial infarction and the actual decline of their health status, whereas middle-aged women may need more time to adjust and figure out how to cope with the current and further decline of their health as they age [13,14]. Indeed, Hawkes et al. [15] found that those ages 60 and younger (predominately male) reported lower mental health quality of life after a heart attack than did those over age 60.

Although the use of BRFSS data allowed large representative samples in which to assess variable relations, there was no information about the time before or since each participant's heart attack including the development of comorbid conditions or the progression of mental health. For our mental health measure, participants were asked about their levels of stress, depression and problems with emotions in the last 30 days; however, there was no information for symptom severity or management. Further, a higher response rate from ethnicities/races other than White or Black, non-Hispanic would have been beneficial to this study.

## Conclusion

Because this was a population-based study, the results may generalize to women ages 50 and older in cardiovascular and primary care settings, as both provide care for post-MI patients. In these settings, about half of post-MI older adult women may report good mental health. In addition, within the post-MI older adult population, one-third of females are likely to present with a previous diagnosis of depression. Based on the results of the current study, there was not a relationship between mental health and ethnicity/race. However, there were consistent inverse relationships between mental health and depression and consistent and positive relationships between mental health and age. Current clinical recommendations from the American Academy of Family Physicians (AAFP) concerning post-MI care involve routine screenings for depressive symptoms, especially for those 65 and older [6]. Therefore, practitioners should continue to screen post-MI women for mental health regardless of ethnicity/race, taking note of those with a history of depression. However, based on the findings of this study, we recommend focusing on women ages 50 and older. Practitioners

should provide mental health education, including signs and symptoms to watch for and coping strategies, and referrals as needed.

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