

The relationship between general mental health and number of health conditions in middle-aged females in the general U.S. population

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Abstract

Purpose: Research has shown that poor mental health is related to chronic health conditions; however, this relationship has not been assessed specifically in middle-aged women. Therefore, the purpose of this study was to determine whether general mental health differs by number of health conditions in middle-aged females in the general population.

Methods: This cross-sectional analysis used 2017 data from the Behavioral Risk Factor Surveillance System (BRFSS) for middle-aged females ages 45 to 64 from Maine (N=2112), Massachusetts (N=1285), Minnesota (N=3131), Mississippi (N=1036), and New Hampshire (N=1262). Ordered logistic regression analyses were conducted by state to analyze the relationship between mental health (low, moderate, high) and number of health conditions while controlling for health-related, demographic, and socioeconomic factors.

Results: Across states, the results indicated that about one-third of females ages 45 to 64 years reported low to moderate general mental health, and over two-thirds reported one or more health conditions. The results of adjusted analysis indicated that mental health was inversely related to health conditions with the relationship strengthening as the number of health conditions increased.

Conclusion: Across states, mental health issues and multiple health conditions were prevalent and moderately to highly related in middle-aged women. Thus, practitioners should automatically screen for both in this target population and treat concurrently.

Introduction

Poor mental health, including depression, has become increasingly widespread as depression alone affects one in ten individuals in the general population and over 300 million people may currently have it [1-3]. Poor mental health is associated with an increased risk of suicide, morbidity, and mortality as well as with increased direct and indirect medical costs [4,5]. In addition, mental health issues can be exacerbated by substance use [2,3,6] and can differ by socioeconomic factors including income level, education, and occupational status and by demographic factors such as age, gender, country of origin, and marital status [7,8].

Moreover, mental health may be related to having chronic health conditions. For example, poorer mental health has been linked to specific health conditions such as diabetes, asthma, hypertension, arthritis, ulcers, heart disease, back/neck problems, chronic headaches, and obesity as well as to having multiple conditions and increased severity of pre-existing health conditions [4-11]. However, few studies focus on the relationship between mental health issues and health conditions specifically for middle-aged females in the general population who may be at higher risk for both, or on general mental health versus diagnosed mental illnesses [1,2]. Therefore, the purpose of this study is to assess the relationship between general mental health and number of health conditions in middle-aged females in the U.S. general population.

Methods

Design

This study was a cross-sectional analysis of data from the 2017 Behavioral Risk Factor Surveillance System (BRFSS), which is conducted by the Center of Disease for Control and Prevention (CDC) [12]. The purpose of BRFSS is to collect uniform data from all 50 states and several U.S. territories on preventative health practices and risk behaviors. The data was collected through telephone surveys with non-institutionalized, civilian adults ages 18 and older with a landline or cell phone using Random Digit Dialing (RDD) techniques. The CDC compiles this data and makes deidentified data available to researchers to conduct 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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Key words: mental health, chronic disease, women's health, middle-aged, primary health care

Received: April 11, 2019; **Accepted:** April 23, 2019; **Published:** April 26, 2019

Sample

The samples for this analysis included females ages 45 to 64 years old in Maine (N=2112), Massachusetts (N=1285), Minnesota (N=3131), Mississippi (N=1036) and New Hampshire (N=1262) with data for mental health and health conditions. These states were chosen from the BRFSS 2016 prevalence survey data maps because of their higher proportions of middle-aged females and varied mental health [13].

Data

The outcome, mental health, was originally measured as low, moderate, or high number of days in the past 30 days in which mental health was “not good,” including “stress, depression and problems with emotions.” We reversed this variable to represent number of “good days” as “low” (0-16 days), “moderate” (17-29 days), and “high” (30 days). The factor of interest was calculated as the number of “yes” responses to ever being diagnosed with any of the following: arthritis; asthma; cancer, other; cancer, skin; coronary heart disease (CHD); chronic obstructive pulmonary disorder (COPD); diabetes; heart attack; high blood pressure; high cholesterol; kidney disease; or stroke. We then categorized this value as “none,” “one,” “two,” “three,” or four or more” health conditions.

The control variables included alcohol use, tobacco use, age, ethnicity/race, marital status, education level, employment status, and income level, all of which are related to adult mental health in the literature [1-3,6-8]. Alcohol use categories were “use in last 30 days” vs. “no use in last 30 days.” Tobacco use categories were “smoker” vs. “non-smoker.” We used the BRFSS age categories of “45-54” and “55-64” years old. For ethnicity/race, we used “white, non-Hispanic” vs. “other.” Marital status was categorized as “married” vs. “other.” Education level was measured as “graduated college/technical school” vs. “did not graduate college/technical school.” Employment status was measured as “employed” vs. “not employed.” Income level was measured as “\$50,000 or more” vs. “less than \$50,000.”

Analysis

We analyzed state data separately in order to assess patterns in variable relations across similar samples. As such, similar results in 3 or more of the 5 states were considered consistent evidence for relations. Ordered logistic regression by state was used to determine the relationship between mental health and number of health conditions after controlling for health-related, demographic, and socioeconomic factors. In ordered logistic regression, the proportional odds produced for each factor is interpreted as follows: for a one unit increase in the factor (i.e., comparing the designated group to the referent group), the resulting AOR applies to the odds of reporting the highest group of the outcome versus the lower groups of the outcome, as well as to the odds of reporting the high and middle groups of the outcome versus the low group of the outcome, after controlling for all other variables in the model. Any observations with missing data for any variables were excluded from adjusted analysis. All analyses were conducted in STATA 15 (©1985-2017 StataCorp LLC).

Results

Descriptive statistics

As shown in table 1, about one-third of participants reported low or moderate mental health (34-42%), and over three-fourths reported being diagnosed with at least one health condition (67-81%). Also shown in table 1, the highest reported health conditions included high blood pressure (29-54%), high cholesterol (31-47%), and arthritis (28-39%), followed by diabetes (12-21%), asthma (12-19%), and cancer (other than skin; 10-12%). Across states for control variables (not shown), up to two-thirds reported no alcohol use (37-65%), and over half reported never smoking (54-61%). For demographics factors, the majority were white, non-Hispanic (58-96%), and over half reported being married (51-67%). For socioeconomic status, about half reported graduating college (36-55%), and up to two-thirds reported being

Table 1. Participant-reported mental health and health conditions across states

Variable	Maine n = 2112		Massachusetts n = 1285		Minnesota n = 3131		Mississippi n = 1036		New Hampshire n = 1262	
	N	%	N	%	N	%	N	%	N	%
Mental Health										
Low	308	15	170	13	300	10	180	17	165	13
Moderate	552	26	359	28	763	24	257	25	309	24
High	1252	59	756	59	2068	66	599	58	788	62
Health Conditions										
None	494	23	346	27	1022	33	192	19	340	27
One	594	28	370	29	909	29	226	22	360	29
Two	447	21	236	18	616	20	236	23	261	21
Three	275	13	160	12	322	10	155	15	142	11
Four or more	302	14	173	13	262	8	227	22	159	13
Specific Conditions										
Arthritis	823	39	435	34	872	28	422	41	471	37
Asthma	392	19	249	19	373	12	154	15	221	18
Cancer, other	249	12	136	11	303	10	89	9	141	11
Cancer, skin	169	8	110	9	201	6	53	5	96	8
CHD	53	3	27	2	53	2	56	5	32	3
COPD	181	9	103	8	154	5	114	11	96	8
Diabetes	248	12	148	12	304	10	218	21	128	10
Heart attack	47	2	20	2	62	2	52	5	25	2
High blood pressure	698	33	398	31	893	29	559	54	366	29
High cholesterol	814	39	453	35	972	31	483	47	398	32
Kidney disease	65	3	35	3	94	3	36	3	40	3
Stroke	49	2	30	2	63	2	55	5	31	2

Table 2. Adjusted results across states

Predicting mental health status (low vs. moderate vs. high)	Maine	Massachusetts	Minnesota	Mississippi	New Hampshire
	AOR 95 % CI	AOR 95 % CI	AOR 95 % CI	AOR 95 % CI	AOR 95 % CI
Health Conditions					
No health conditions	ref	ref	ref	ref	ref
1 health condition	0.66 0.50, 0.86	0.61 0.42, 0.86	0.64 0.52, 0.80	0.85 0.55, 1.34	0.67 0.46, 0.96
2 health conditions	0.52 0.39, 0.70	0.61 0.41, 0.92	0.46 0.36, 0.58	0.67 0.43, 1.06	0.67 0.45, 0.99
3 health conditions	0.47 0.33, 0.66	0.39 0.24, 0.63	0.41 0.31, 0.55	0.55 0.33, 0.89	0.47 0.29, 0.75
4 or more health conditions	0.30 0.21, 0.42	0.28 0.17, 0.46	0.33 0.24, 0.45	0.32 0.20, 0.50	0.25 0.15, 0.39

AOR=adjusted odds ratio; 95% CI=95% confidence intervals; ref=referent group. The model controlled for alcohol use, tobacco use, age, ethnicity/race, marital status, education level, employment status, and income level. For inverse relations, take the inverse of significant odds ratios to obtain effect size (1/AOR), which then reads as “participants in the designated group are 1/AOR times LESS likely than participants in the referent group to report each successive level of mental health status.”

employed (48-72%) and having an income level greater than or equal to \$50,000 (39-73%).

Adjusted statistics

As shown in table 2, the results of ordered logistic regression analysis for middle-aged females in Maine, Massachusetts, Minnesota, Mississippi, and New Hampshire indicated that after controlling for all other variables in the models, mental health differed by number of health conditions. Across states, compared to those with no health conditions, those who with one health condition were about 1.5 to 1.6 times less likely to report each successive level of mental health; those with two health conditions were about 1.5 to 2.2 times less likely to report each successive level of mental health; those with three health conditions were about 1.8 to 2.6 times less likely to report each successive level of mental health; and those with four or more health conditions were about 3 to 4 times less likely to report each successive level of mental health.

Discussion

The purpose of this study was to assess the relation between general mental health and number of health conditions in middle-aged women in the general population. The results indicated that about one-third of females ages 45 to 64 years reported low or moderate general mental health, and over two-thirds reported one or more health conditions, the most prevalent diagnoses being high blood pressure, high cholesterol, and arthritis, followed by diabetes, asthma, and cancer (other than skin). The results of this study showed an inverse relationship between reported mental health and health conditions and the relationship strengthened as the number of health conditions increased: middle-aged females with one condition were about 1.5 times less likely, those with two conditions were about 1.5 to 2 times less likely, those with three conditions were about 2 to 2.5 times less likely, and those with four or more diagnoses were about 3 to 4 times less likely, to report each successive level of mental health. Our findings were consistent with previous studies that indicated depression and anxiety are related to having chronic health conditions in various target populations of adults [4-11]. To our knowledge, this is the first study to focus on the relation between general mental health and health conditions solely in this target population who may be at higher risk for both mental health issues and health conditions [1,2].

However, this study is not without limitations. Although we used a current general mental health measure rather than a diagnosis of the past and we had large number of health conditions to utilize, there was

no information on the severity or management strategies for mental health issues or health conditions, including medication use, which could impact relations. Future research should include the assessment of management strategies in the relationship between mental health and chronic health conditions.

Conclusions

Because this was a population-based study, the results may be generalizable to middle-aged females in a primary care setting. Providers may expect about one-third of middle-aged women to report mental health issues and about two-thirds to report one or more health conditions. Because both may be prevalent and moderately- to highly-related in this target population, providers should automatically screen for mental health issues and health conditions in women ages 45 to 64 regardless of whether symptoms present. Treatments and side effects of treatments for comorbid conditions should be assessed concurrently.

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