Mental Health and Access to Medical Care in Patients with Chronic Cardiovascular Conditions: An Analysis of the Behavior Risk Factor Surveillance System

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ABSTRACT

Introduction. Poor mental health is associated with worse outcomes for chronic diseases. It is unclear whether mental illness predisposes to difficulties with healthcare access.

Methods. Using a combined dataset of the 2016-2019 Behavioral Risk Factor Surveillance System, this study focused on individuals who reported a chronic cardiovascular condition. Weighted multivariable logistic regression analyses were used to explore the association between domains of mental health and measures of healthcare access including delaying medical care, more than one year since last routine checkup, lack of a primary care physician, and cost-related medication nonadherence.

Results. Among 1,747,397 participants, 27% had a chronic cardiovascular condition, 12% had clinical depression, and 12% had poor mental health. Those with poor mental health (OR 3.20 [3.08 - 3.33]) and clinical depression (OR 2.43 [2.35 - 2.52]) were more likely to report delays in medical care. Those with greater stress frequency (OR 8.47 [6.84 -10.49] stressed all of the time), lower levels of emotional support received (OR 3.07 [2.21 - 4.26] rarely get needed emotional support), and greater life dissatisfaction (6.66 [4.14 – 10.70] very dissatisfied) reported greater delays in medical care.

Conclusions. Individuals with poor mental health have greater difficulty accessing medical care independent of socioeconomic variables.
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INTRODUCTION

Mental illness including depression and anxiety has been associated with poor outcomes in patients with history of cardiovascular diseas.[1] Previous studies have linked history of depression with increased chance of developing acute coronary syndrome.[2] Moreover, almost 15% percent of patients who suffer myocardial infarction experience severe depression following their hospitalization,[3] with those experiencing depression having increased risk of mortality.[4] In patients with stroke, depression was linked with higher mortality and worse quality of life.[5] Similar associations between depression and diabetes also have been demonstrated.[6]

The underlying reasons for the correlations are not established firmly, and there is debate regarding whether depression is merely a risk marker or a causative factor in cardiovascular disease. While plausible biological mechanisms exist, including elevated pro-inflammatory markers and autonomic dysregulation,[1,7,8] at least part of the association between depression and poor cardiovascular outcomes likely was due to psychosocial factors and disparities in care. Patients with history of depression have double the rate of medication nonadherence.[9-11] Moreover, previous studies have linked mental illness with receipt of less comprehensive medical care, including fewer guideline recommended screening practices.[12,13]

It is possible that patients with poor mental health have greater difficulty accessing and utilizing healthcare, either due to motivational issues or poor support systems that make accessing and having sustained follow-up in a complex healthcare system more challenging. Using a large, nationally representative sample, this study examined the relationship between mental health and different measures of healthcare access among individuals with history of chronic cardiovascular conditions. It also explored the association between mental health and cost-related medication nonadherence (CRMNA).

METHODS

Data were utilized from the 2016 to 2019 Behavioral Risk Factor Surveillance System (BRFSS), an annual U.S. national survey administered by the U.S. Centers for Disease Control and Prevention (CDC). Surveys were administered via telephone by trained professionals to adults 18 years and older, who were selected randomly from blocks of potential telephone numbers within an area.[14] Institutional review board approval was not necessary as BRFSS is a publicly available dataset. This study included all individuals who reported a history of chronic cardiovascular conditions including diabetes, hypertension, or atherosclerotic cardiovascular disease (ASCVD) including stroke or myocardial infarction.

Domains of mental health included subjective poor mental health, history of clinical depression, stress frequency, level of emotional support received, and life satisfaction. Poor mental health was defined as answering "at least 15 days" to the survey prompt, "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?". The survey prompts used to derive other domains of mental health are listed in Table 1. Outcomes of interest utilized as measures of poor healthcare access included delaying medical care for any reason including cost within the last year, last routine checkup being greater than one year ago and lacking a primary care physician (PCP). Given the importance of medication adherence in the management of chronic cardiovascular conditions, CRMNA also was included as an outcome of interest. The survey prompts used to derive outcome measures are listed in Table 1.

Table 1. Survey questions used to derive domains of mental health and measures of healthcare access.

Measure	Survey question
Domains of mental health	
Poor mental health	"Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"
Clinical depression	"(Ever told) you have depression (including depression, major depression, dysthymia, or minor depression)?"
Stress frequency	"Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Within the last 30 days, how often have you felt this kind of stress?"
Emotion support received	"How often do you get the social and emotional support you need?"
Life satisfaction	"In general, how satisfied are you with your life?"
Measures of healthcare access	
Delayed medical care	"Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?" and "Other than cost, have you delayed getting medical care for one of the following reasons in the past 12 months? Was it because..." • You couldn't get through on the telephone. • You couldn't get an appointment soon enough. • Once you got there, you had to wait too long to see the doctor. • The clinic or doctor's office wasn't open when you got there. • You didn't have transportation. • No, I did not delay getting medical care/did • Don't know/Not sure
Greater than one year since last primary care visit	"About how long has it been since you last visited a doctor for a routine checkup?"
Lack of primary care physician	"Do you have one person you think of as your personal doctor or health care provider?"
Cost-related medication nonadherence	"Not including over the counter (OTC) medications, was there a time in the past 12 months when you did not take your medication as prescribed because of cost?"

CDC-provided survey weights were utilized for all statistical analysis. The weighted prevalence of demographic characteristics of the overall population were estimated. The authors performed multivariable weighted logistic regression models to examine the association between mental health domains and measures of poor access to healthcare and CRMNA. Analyses were adjusted for age, gender, race, educational attainment, employment, household income, living in a Medicaid expansion state, healthcare coverage, language, living in a rural area, and number of comorbidities (hyperlipidemia, smoking history, chronic kidney disease, chronic obstructive pulmonary disease, arthritis, asthma, cancer). All analyses were performed using STATA version 16.1 (Statacorp, College Station, TX).

RESULTS

Among a total 1,747,397 survey respondents, 21% were above age 65, 63% were white, 12% were black, 17% were Hispanic, 51% were female, 18% were unemployed, 33% had hypertension, 11% had diabetes, and 9% had ASCVD. Mean household income was $60, 544 ± 39,527; 5% lived below the federal poverty line. In total, 88% had health coverage. Among those who had health coverage, 46% had employer sponsored insurance plans, 12% had individually purchased plans, 23% had Medicare, 10% had Medicaid, and 9% had other health types of health coverage. Regarding mental health domains, 18% reported history of clinical depression, 12% reported poor mental health, 20% received the emotional support they need sometimes or less frequently, 31% felt stressed some of the time or more frequently, and 5% were dissatisfied or very dissatisfied with their life.

In total, 592,401 (27%) individuals reported a history of at least one chronic cardiovascular condition. Among those, 15% reported having delayed medical care within the last year. Among those who delayed care for reasons other than cost, 5% delayed medical care because they could not get through on the phone, 30% could not get an appointment soon enough, 15% stated the wait was too long to see the doctor, 4% stated the clinic or doctor's office was not open when they got there, 19% did not have transportation, 23% had other unspecified reasons, 4% refused to answer or did not know. Survey weighted multivariable regression showed those who reported poor mental health were more likely to report having delayed medical care (OR 3.20 [3.08 - 3.33]), as were individuals with history of clinical depression (OR 2.43 [2.35 - 2.52]). There was a graded association between stress frequency and delays in medical care as follows: being stressed a little of the time, OR 1.99 [1.67 - 2.35], some of the time, OR 3.55 [3.01 - 4.20], most of the time, OR 5.45 [4.49 - 6.23], or all of the time, OR 8.47 [6.84 - 10.49]. Similar graded associations were observed for level of emotional support received and life satisfaction with delays in medical care (Table 2).

No routine checkup within the last year was reported by 13% of individuals with chronic cardiovascular conditions. Those with poor mental health were more likely to have not had a routine checkup within the last year (OR 1.32 [1.20 - 1.45]). There was no association between clinical depression and no routine checkup within the last year. Those with greater stress frequency were more likely to have gone greater than one year since their last routine checkup (stressed all of the time OR 1.72 [1.27 - 2.34]), as were those who reported dissatisfaction with their lives (dissatisfied OR 2.82 [1.33 - 5.96]).

Lack of PCP was prevalent in 11% of individuals with chronic cardiovascular conditions. Those who reported poor mental health also were more likely to lack a PCP (OR 1.29 [1.14 - 1.46]), whereas there was no association between clinical depression and lack of PCP (OR 0.93 [0.83 - 1.04]). Greater frequency of stress, lower levels of emotional support, and life dissatisfaction were correlated with lacking a PCP (Table 2).

Furthermore, 14% of individuals with chronic cardiovascular conditions delayed taking prescription medications due to cost within the last year. Similar correlations existed between the various domains of mental health and CRMNA. Those with subjective poor mental health were more likely to have delayed taking medications because of cost (OR 2.10 [1.50 - 2.94]), as were those with a history of clinical depression (OR 2.27 [1.70 - 3.05]). A graded association was present between stress frequency and CRMNA: being stressed a little of the time, OR 1.26 [0.76 - 2.07], some of the time, OR 3.28 [1.91 - 5.63], most of the time, OR 3.01 [1.67 - 5.44], or all of the time, OR 5.33 [2.40 - 11.84] (Table 3).

Table 2. Association between domains of mental health and measures of healthcare access in patients with history of cardiovascular disease.

Variable	Delayed medical care[1]	> 1 year since last primary care visit[2]	Lack of primary care physician[3]
Poor mental health[a]			
No	Ref	Ref	Ref
Yes	3.20 [3.08 - 3.33]*	1.32 [1.20 - 1.45]*	1.29 [1.14 - 1.46]*
Clinical depression[b]			
No	Ref	Ref	Ref
Yes	2.43 [2.35 - 2.52]*	1.09 [0.99 - 1.18]	0.93 [0.83 - 1.04]
Stress frequency[c]			
None of the time	Ref	Ref	Ref
A little of the time	1.99 [1.67 - 2.35]*	1.29 [1.08 - 1.55]*	1.33 [1.03 - 1.72]*
Some of the time	3.55 [3.01 - 4.20]*	1.32 [1.07 - 1.62]*	1.31 [1.00 - 1.72]*
Most of the time	5.45 [4.49 - 6.23]*	1.88 [1.42 - 2.50]*	1.81 [1.19 - 2.75]*
All of the time	8.47 [6.84 - 10.49]*	1.72 [1.27 - 2.34]*	1.82 [1.22 - 2.69]*
"How often do you get the emotional support you need?"[d]			
Always	Ref	Ref	Ref
Usually	1.42 [1.16 - 1.72]*	1.28 [0.88 - 1.86]*	1.58 [0.95 - 2.64]
Sometimes	3.11 [2.53 - 3.83]*	1.72 [1.03 - 2.88]*	2.23 [1.16 - 4.30]*
Rarely	3.07 [2.21 - 4.26]*	2.38 [1.16 - 4.89]*	3.59 [1.58 - 8.17]*
Never	1.66 [1.25 - 2.21]*	0.90 [0.43 - 1.91]	1.39 [0.55 - 3.49]
Life satisfaction[e]			
Very satisfied	Ref	Ref	Ref
Satisfied	2.12 [1.78 - 2.52]*	1.75 [1.28 - 2.40]*	1.41 [0.92 - 2.17]
Dissatisfied	5.59 [4.19 - 7.46]*	2.82 [1.33 - 5.96]*	1.58 [0.61 - 4.11]
Very dissatisfied	6.66 [4.14 - 10.70]*	4.44 [0.93 - 21.31]	6.98 [1.38 - 35.42]*

[1] "Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?" and "Other than cost, have you delayed getting medical care for one of the following reasons in the past 12 months? Was it because...?"
[2] "About how long has it been since you last visited a doctor for a routine checkup?"
[3] "Do you have one person you think of as your personal doctor or health care provider?"
[a] "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"
[b] "(Ever told) you have depressive (including depression, major depression, dysthymia, or minor depression)?"
[c] "Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Within the last 30 days, how often have you felt this kind of stress?"
[d] "How often do you get the social and emotional support you need?"
[e] "In general, how satisfied are you with your life?"
* Significant association.

Table 3. Association between domains of mental health and cost-related medication nonadherence in patients with history of cardiovascular disease.

Variable	Cost-related medication nonadherence[1] OR [95% CI]
Poor mental health[a]	
No	Ref
Yes	2.10 [1.50 - 2.94]*
Clinical depression[b]	
No	Ref
Yes	2.27 [1.70 - 3.05]*
Stress frequency[c]	
None of the time	Ref
A little of the time	1.26 [0.76 - 2.07]
Some of the time	3.28 [1.91 - 5.63]*
Most of the time	3.01 [1.67 - 5.44]*
All of the time	5.33 [2.40 - 11.84]*
"How often do you get the emotional support you need?"[d]	
Always	Ref
Usually	1.27 [0.69 - 2.35]
Sometimes	1.32 [0.60 - 2.93]
Rarely	3.03 [1.13 - 8.10]*
Never	1.38 [0.31 - 6.07]
Life satisfaction[e]	
Very satisfied	Ref
Satisfied	1.13 [0.59 - 2.14]
Dissatisfied	2.56 [0.90 - 7.29]
Very dissatisfied	1.10 [0.08 - 15.61]

[1] Cost-related medication nonadherence was derived from the survey prompt "Not including over the counter (OTC) medications, was there a time in the past 12 months when you did not take your medication as prescribed because of cost?"

[a] "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"

[b] "(Ever told) you have depressive (including depression, major depression, dysthymia, or minor depression)?"

[c] "Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Within the last 30 days, how often have you felt this kind of stress."

[d] "How often do you get the social and emotional support you need?"

[e] "In general, how satisfied are you with your life?"

* Significant association.

DISCUSSION

This study found that among individuals with a history of chronic cardiovascular conditions, those with poor mental health have relatively greater difficulties in accessing healthcare, reporting more delays in care, fewer routine checkups, lower rates of having a PCP, and higher rates of CRMNA. Similar associations existed with other domains of mental health, with those reporting the greatest levels of stress frequency, lowest levels of emotional support, and greatest life dissatisfaction also reporting the greatest difficulty accessing medical care.

Poor mental health is an established risk marker for poor prognosis in cardiovascular disease, but its role as a risk factor is unclear as causal links and explanatory mechanisms remain incompletely defined.[1] Previous studies in which depression was treated medically have failed to yield an improvement in outcomes.[15] As such, in addition to biological mechanisms, it is equally important to consider how psychosocial determinants of health may impact prognosis. Medication nonadherence may be one component of how mental health modulates cardiovascular outcomes.[2,10] Our findings further raise the question of disparities in healthcare access, demonstrating a graded association between poor mental health and difficulties accessing medical care.

This relationship between poor mental health and healthcare access persisted despite adjusting for socioeconomic variables including employment status, household income, and healthcare coverage. Potentially, those with poor mental health have lower motivational levels and less social support, which make navigating a complex and sometimes convoluted healthcare system more difficult. Previous

studies have linked depressive symptoms with lower "self-efficacy" scores that may predispose patients to be less proactive with regards to their medical management, which in addition to rendering close follow up less likely could compromise other aspects of medical management such as medication adherence and making healthy lifestyle choices.[16-18] Moreover, other social conditions that may be coincident with and contributing to poor mental health could exacerbate the observed disparities in healthcare access.

Lapses in medical care such as those observed in our study are important to address, especially in the management of chronic cardiovascular conditions requiring meticulous follow-up and medical management. Potential interventions could include screening patients with cardiovascular conditions for mental illness and deploying resources to ensure adequate healthcare access. Whether deploying resources to alleviate such disparities would improve outcomes is uncertain as previous efforts to treat depression and to ensure optimal medical adherence have failed to improve outcomes.[15]

The results of this study were limited by the self-reported nature of the variables and the ability to only control for variables present within the BRFSS dataset. As such, factors in detail including regimen complexity, disease severity, and comprehensiveness of insurance coverage could not be adjusted. Also, the data were unable to distinguish between treated and untreated depression. Also, it was possible the results were biased by confounders that have been unaccounted for. Lastly, given the cross-sectional nature of the analyses, delays in accessing medical care made inferences regarding causality difficult.

CONCLUSIONS

Poor mental health was associated independently with poor healthcare access and CRMNA among patients with cardiovascular conditions. More research is needed to explore the relationship between mental health and access to care in those with chronic cardiovascular conditions. Improving access to healthcare could improve cardiovascular outcomes among this high-risk population.

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