

Gender, Depressive Symptoms, Chronic Medical Conditions, and Time to First Psychiatric Diagnosis among American Older Adults

Abstract

Background: To test whether gender moderates the effects of baseline depressive symptoms and chronic medical conditions (CMCs) on risk of receiving subsequent psychiatric diagnosis among older adults. **Methods:** Data came from ten waves of the Health and Retirement Study, a nationally representative longitudinal study. We followed 9794 individuals older than 52 years without any diagnosed psychiatric disorder at baseline for up to 18 years. Baseline depressive symptoms and CMC were the predictors, time to receiving an emotional diagnosis was the outcome, baseline demographics and socioeconomics were controls, and gender was the moderator. We used Cox proportional hazards models for data analysis. **Results:** In the pooled sample, female gender increased the effect of baseline depressive symptoms (hazard ratio [HR], 1.58; 95% confidence interval [CI], 1.26–2.00) and reduced the effect of baseline CMC (HR, 0.78; 95% CI, 0.63–0.97) on time to receiving a psychiatric diagnosis. Among men, baseline depressive symptoms (HR, 2.36; 95% CI, 1.87–2.97) increased and baseline CMC (HR, 0.81; 95% CI, 0.69–0.95) decreased time to receiving a psychiatric diagnosis. Among women, depressive symptoms (HR, 1.49; 95% CI, 1.21–1.83) but not CMC (HR, 1.06; 95% CI, 0.91–1.23) were associated with time to receiving a psychiatric diagnosis over time. **Conclusions:** Men and women differ in how depressive symptoms and CMC influence their risk of receiving a psychiatric diagnosis over time. Depressive symptoms are more salient promoter for men than women while CMC is only a barrier for men.

Keywords: Chronic medical conditions, depressive symptoms, gender

Introduction

Men and women differ in health-care seeking which influences risk of receiving a psychiatric diagnosis.^[1-3] Gender of the patient plays an important role in the identifying depression by physicians.^[4] Depression is more likely to be diagnosed among women compared to men, even with the same severity of the illness.^[4-7] In the presence of emotional problems, female patients have a higher chance of receiving a diagnosis as having an emotional disorder than males.^[1,2,4,6,8-10] Green *et al.* showed that gender does not directly influence health service utilization but increases service utilization through perception of poorer health and emotional perception.^[11]

Given the effects of gender on how individuals use general^[10,12-17] and mental^[1,5,7,18-24] health care services, we tested moderating effects of gender on the role of depressive symptoms and chronic medical conditions (CMCs) on time to

receiving a psychiatric diagnosis over an 18-year follow-up period.

Methods

Study design

We used data from ten waves (1994–2012) of the Health and Retirement Study (HRS), a longitudinal survey of a nationally representative sample of adults over the age of 50 years in the United States. RAND HRS data file was used for this analysis. HRS is the premier source of data on health of the aging population in the United States. HRS is funded by the National Institute on Aging and housed at the University of Michigan's Institute for Social Research. All participants have provided written consent, and the study protocol has been approved by the University of Michigan, Institutional Review Board. Greater detail about the HRS protocol and data collection is provided elsewhere.^[25]

Participants

The HRS involves a multistage area probability design with geographic

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stratification and clustering. In addition, to ensure a large enough representation of minorities, HRS oversamples Black and Hispanic households at about twice the rate of Whites.^[26] The sample weights were applied analytically to account for the differential probability of selection into the study and differential nonresponse. The follow-up rate is around 90% at each wave.^[25]

As the first measure of depression is available at wave 2, baseline for this study is at wave 2. Thus, we began our observation at wave 2 in 1994 when the HRS cohort was 53–63 years old. Although 11,596 respondents were interviewed at wave 2 (baseline of this analysis), our analytic sample size was 9794. This was because to study incident diagnosis of any psychiatric disorders, we eliminated prevalent cases of psychiatric diagnoses. We only enrolled individuals who had data on psychiatric diagnosis in at least one other wave in the next 18 years.

Measures

Sociodemographics

Data were collected on age, race (reference: White), Hispanic ethnicity (reference: non-Hispanics), gender (reference: male), education (in years), and marital status (reference: married).

Depressive symptoms

We used an 8-item version of the Center for Epidemiologic Studies Depression Scale (CES-D) for measurement of depressive symptoms.^[27] Internal consistency was good (Cronbach's alpha = 0.80).^[28] We used a cutoff score of 4 to indicate substantially elevated depressive symptoms. This cutoff score is comparable to a cutoff score of 16 on the full CES-D.^[28,29]

Chronic medical conditions

At entry into the study, HRS assesses the history of seven CMCs including heart disease, hypertension, stroke, diabetes, arthritis, lung disease, and cancer. We created a CMC total score that indicated number of CMC at baseline.

Receiving a psychiatric diagnosis

In each wave, participants were asked "Has a doctor ever told you that you had emotional, nervous, or psychiatric problems?" Respondents answer yes or no.

Statistical analysis

For the purpose of this study, we used the RAND Corporation HRS data. Stata-13 (StataCorp., College Station, TX, USA) was used for data analysis. As sample weights were applied in all, the analysis, stratification, clustering, and nonresponse were accounted for in the estimation of standard errors, using Taylor series linearization method. Based on attrition analysis,

individuals who were older had higher CMC, and elevated depressive symptoms at baseline were at higher risk of attrition over the follow-up period.

We used the Cox proportional hazards models for multivariable analysis. To test the proportional hazards assumption, we used estat phtest in Stata for our Schoenfeld residual analysis. In the first step, we ran our models without and with interactions in the pooled sample. Model 1 evaluated the effect of depressive symptoms and CMC with no covariate in the model. Model 2 also controlled for race, gender, and ethnicity. Model 3 also controlled for age, education, and marital status. Model 4 included two interaction terms: (1) gender \times baseline depressive symptoms and (2) gender \times baseline CMC. In the second step, we ran stratified models by gender to determine factors associated with receiving a psychiatric diagnosis over 18 years among men (Models 1–3) and women (Models 4–6). Hazard ratios (HRs) with 95% confidence intervals (CIs) are reported. $P < 0.05$ was considered significant.

Results

Table 1 reports descriptive statistics for the total sample. From all participants, 52% were men. The average age at baseline (wave 2) was 57 years with about 12 years of education. About 33% had at least one CMC and 10.8% reported elevated depressive symptoms at baseline (wave 2). Nearly 13.9% of the participants received a psychiatric diagnosis during the 18-year follow-up period. More women had high depressive symptoms compared to men. A larger proportion of women received psychiatric diagnosis than men over the follow-up period.

Table 2 reports hierarchical Cox regressions in the full sample. In Models 1–3, depressive symptoms were associated with higher risk of the outcome. Model 4 which also included the gender \times baseline depressive symptoms and gender \times baseline CMC interaction terms showed that male gender interacted significantly with baseline depressive symptoms (HR, 1.58; 95% CI, 1.26–2.00) and baseline CMC (HR, 0.78; 95% CI, 0.63–0.97) on time to receiving psychiatric diagnosis.

Table 3 provides the results of hierarchical Cox regressions in men (Models 1–3) and women (Models 4–6). According to Model 3, net of covariates, baseline depressive symptoms (HR, 2.36; 95% CI, 1.87–2.97) increased and baseline CMC (HR, 0.81; 95% CI, 0.69–0.95) decreased time to receiving a psychiatric diagnosis among men. According to Model 3 among women, while elevated depressive symptoms (HR, 1.49; 95% CI, 1.21–1.83) predicted risk of receiving a subsequent psychiatric diagnosis, CMC (HR, 1.06; 95% CI, 0.91–1.23) was not associated with time of receiving a psychiatric diagnosis among women.

Table 1: Descriptive statistics of the sample in the pooled sample and based on gender

	All (n=9794)	Men (n=5100; 52%)	Women (n=4694; 48%)
Age (wave 2), mean (SE)	57.40 (0.040)	57.44 (0.051)	57.36 (0.050)
Years education (wave 2), mean (SE)	12.54 (0.082)	12.73 (0.085)	12.37 (0.088)
Depressive symptoms (wave 2), mean (SE)	1.06 (0.034)	0.91 (0.036)	1.20 (0.040)
Chronic medical conditions (wave 2), mean (SE)	1.06 (0.014)	1.03 (0.018)	1.09 (0.018)
Marital status (wave 2), n (%)			
Married/partnered	6945 (79.27)	3959 (87.24)	2986 (70.71)
Divorced	802 (9.15)	286 (6.3)	516 (12.22)
Separated/widowed	753 (8.59)	177 (3.9)	576 (13.64)
Never married	261 (2.98)	116 (2.56)	145 (3.43)
Race, n (%)			
White	8066 (82.36)	4296 (84.24)	3770 (80.32)
Black	1728 (17.64)	804 (15.76)	924 (19.68)
Ethnicity, n (%)			
Non-Hispanics	8955 (91.46)	4670 (91.59)	4285 (91.33)
Hispanics	836 (8.54)	429 (8.41)	407 (8.67)
Depressive symptoms (wave 2), n (%)			
CES-D <4	7314 (89.21)	3717 (91.82)	3597 (86.65)
CES-D ≥4	885 (10.79)	331 (8.18)	554 (13.35)
Chronic medical conditions (wave 2), n (%)			
Negative	3227 (32.95)	1687 (33.08)	1540 (32.81)
Positive	6567 (67.05)	3413 (66.92)	3154 (67.19)
Psychiatric diagnosis (from wave 2 to wave 10), n (%)			
Negative	8436 (86.13)	4552 (89.25)	3884 (82.74)
Positive	1358 (13.87)	548 (10.75)	810 (17.26)

Ns reflect the unweighted sample distributions. CES-D=Center for Epidemiologic Studies Depression Scale, SE=Standard deviation

Discussion

In a nationally representative sample of older adults in the United States, baseline level of depressive symptoms was a stronger predictor of receiving a psychiatric diagnosis over time among men than women. Baseline CMC was also a stronger barrier against receiving a psychiatric diagnosis among men compared to women.

Gender alters how depressive symptoms and CMC influence time to receiving a psychiatric diagnosis. This finding may be partly due to higher depressive symptoms among women compared to men. Although elevated depressive symptoms

predicted time to receiving a psychiatric diagnosis among men and women, CMC was only a barrier for men. Literature has shown that women are more likely than men to seek help for mental disorders.^[30-34]

Literature has shown that men and women differently perceive mental health need, express emotional symptoms, and seek help.^[30,34-37] With similar severity of emotional problem, women have higher tendency to use health-care services and are more likely to communicate about their emotional complaints and symptoms with others including health-care providers.^[38] Women better articulate their feelings and are more expressive about their subjective feelings. Such tendency increases women's chance of receiving a diagnosis of an emotional problem.^[17,33,39] Women perceive lower subjective health, experience more depressive symptoms, and more frequently attend primary care doctors than men. All these factors increase chance of receiving a diagnosis for an emotional problem.^[4,40-42] More frequent attendance to primary health-care setting by women increases their interaction with health-care providers that raise the likelihood for evaluation of emotional problems.^[4] In addition, in the presence of minor mental health symptoms, men are more likely than women to delay visiting a doctor.^[40] However, men do seek help when their emotional problem becomes severe and interfere with their daily function and productivity.^[40]

In the absence of a severe emotional problem, recognition of symptoms, acceptance of the sickness, and help seeking without stigma shape help seeking behaviors of individuals.^[17,39,43-45] All these factors are more common among women compared to men.^[17,39,43-45] According to the WHO survey across 24 countries, low perceived need is the most common reason for not initiating treatment of mental disorders. Women have higher tendency to recognize the need for treatment in the presence of minor disorders.^[37]

Although women have a higher tendency for using health services, there are studies not showing any gender differences in the use of specialist care.^[34,42,43] In general population of Canada, depressed women more frequently use mental health services from primary care providers than men; however, no gender differences exist in rates of professional mental health-care use.^[40] Thus, men utilize mental health care equally as women once their mental health problem reaches a certain level.^[30,34,40,43] In Puerto Rico, although gender does not have a main effect on mental health-care utilization, it does change the effects of predictors of use. Definite need for mental health care and poor self-rated mental health had larger effects on service use of men than women.^[1]

Gender differences in help seeking differ across ethnic groups. In a nationally representative survey,^[46] African American men with serious disorders used both psychiatrists (43.7% vs. 27.9%) and nonpsychiatrist mental health services more than women. At the same time,

Table 2: Predictive roles of depressive symptoms and chronic medical conditions on time to receiving a psychiatric diagnosis in the pooled sample (n=9794)

	Model 1		Model 2		Model 3		Model 4	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Depressive symptoms ^a	1.74***	1.47-2.05	1.75***	1.49-2.06	1.76***	1.49-2.08	2.41***	2.03-2.86
Chronic medical conditions ^b	0.94	0.83-1.06	0.94	0.83-1.05	0.95	0.84-1.06	0.81*	0.69-0.96
Race ^c			1.00	0.86-1.15	0.99	0.85-1.15	0.98	0.84-1.15
Hispanics ^d			0.98	0.78-1.23	0.95	0.76-1.19	0.96	0.77-1.19
Gender ^e			0.94	0.83-1.07	0.95	0.84-1.07	0.71**	0.57-0.89
Age					0.98*	0.97-1.00	0.98*	0.97-1.00
Education					1.00	0.98-1.02	1.00	0.98-1.02
Marital status ^f								
Divorced					0.95	0.75-1.20	0.93	0.74-1.16
Separated/widow					1.09	0.91-1.30	1.08	0.90-1.29
Never married					0.95	0.68-1.34	0.94	0.68-1.29
Women × depressive symptoms							1.58***	1.26-2.00
Women × chronic medical conditions							0.78*	0.63-0.97

[#]P<0.1, *P<0.05, **P<0.01, ***P<0.001, ^aReference group=CES-D<4, ^bReference group; no chronic conditions, ^cReference group=Whites, ^dReference group=Non-Hispanics, ^eReference group=Male, ^fReference group=Married. HR=Hazard ratio, CI=Confidence interval, CES-D=Center for Epidemiologic Studies Depression Scale

Table 3: Predictive roles of depressive symptoms and chronic medical conditions on time to receiving a psychiatric diagnosis in men (n=5100) and women (n=4694)

	Men						Women					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Depressive symptoms ^a	2.32***	1.88-2.86	2.34***	1.87-2.92	2.36***	1.87-2.97	1.53***	1.24-1.88	1.52***	1.24-1.86	1.49***	1.21-1.83
Chronic medical conditions ^b	0.81*	0.68-0.96	0.80*	0.68-0.95	0.81*	0.69-0.95	1.03	0.88-1.20	1.03	0.88-1.20	1.06	0.91-1.23
Race ^c			0.98	0.75-1.28	1.01	0.75-1.36			1.00	0.85-1.19	0.98	0.83-1.16
Hispanics ^d			0.93	0.68-1.27	0.99	0.75-1.32			1.03	0.78-1.36	0.92	0.67-1.26
Gender ^e					1.00						1.00	
Age					1.00	0.98-1.03					0.97**	0.95-0.99
Education					1.01	0.99-1.05					0.98	0.96-1.00
Marital status ^f												
Divorced					1.04	0.68-1.58					0.90	0.72-1.14
Separate widow					1.00	0.67-1.49					1.08	0.88-1.34
Never married					1.00	0.64-1.58					0.89	0.58-1.37

[#]P<0.1, *P<0.05, **P<0.01, ***P<0.001, ^aReference group=CES-D <4, ^bReference group; no chronic conditions; ^cReference group=Whites, ^dReference group=Non-Hispanics, ^eReference group=Male, ^fReference group=Married. HR=Hazard ratio, CI=Confidence interval, CES-D=Center for Epidemiologic Studies Depression Scale

African American women were more likely than men to utilize general medical care. This pattern was opposite in Caribbean Blacks.^[46]

Gender bias in diagnosis may also be responsible for differential chance of receiving a psychiatric diagnosis among men and women.^[47] Gender differences in rate of

diagnosis of depression among patients are at least in part due to how physicians observe and evaluate complaints of male and female clients in primary and mental health-care setting.^[4,40] Primary care doctors are more likely to ask regarding feelings and emotions from their female patients,^[4,43] which explain higher depression diagnosis

among women in primary care setting.^[40,43] Studies showed that while male physicians evaluate depressive symptoms and diagnose depression more frequently among female patients, physicians of both genders more frequently suggest counseling to female patients.^[4,47]

Our findings suggest that CMC is a barrier against receiving a psychiatric diagnosis among men but not women. This might be that men less commonly identify and describe their feelings, are less likely to be aware of their emotional symptoms, and are less likely to attribute their feelings to a problem.^[17,48] Masculine gender role socialization defined as cultural values, norms, and ideologies about the role and meaning of being a man may also have a role.^[34,49] Data consistently show that men report better subjective health and less somatic and emotional symptoms than women.^[39]

Our findings extend the existing literature on gender differences in the pattern of general^[12-14] and mental^[1,5,7,18,19,21-24,50] health-care utilization. The findings enhance our current understanding factors that contribute to gender disparities in mental health-care use in the US.^[12,30,32,34]

Our study had at least four limitations. First, the validity of single-item measures of receiving a psychiatric diagnosis is unknown. Second, we did not analyze type of CMCs. Common types of medical conditions may differ among men and women. Third, we used a brief scale to measure depressive symptoms. Finally, we did not use time-varying covariates. The strength of this study is using a large nationally representative sample, which generated findings that are generalizable to the US population.

Conclusions

Elderly men and women differ in the effects of baseline depressive symptoms and CMC on time to receiving a psychiatric diagnosis over an 18-year follow-up period. Depressive symptoms are stronger risk factors, and the number of CMC is a stronger barrier for receiving a psychiatric diagnosis among older men compared to older women.

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Conflicts of interest

There are no conflicts of interest.

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