

## **Racial-Ethnic Disparities in Functional Limitations and Depression Symptoms during the COVID-19 Pandemic**

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### **Abstract**

*Purpose:* This study examines how the impacts of physical and mental comorbidities and functional limitations on depressive symptoms vary by the major racial ethnic groups (i.e., White, Black, and Hispanic). *Methods:* The empirical work of this is based on data from the 2020 Health and Retirement Study (HRS) COVID-10 Project in the United States. *Results:* Findings suggested that physical and mental comorbid conditions, functional limitations, and depressive symptoms co-occur more commonly than expected for all racial ethnic groups. In terms of functional imitations, females fared worse than males (for all racial ethnic groups) and depressive symptoms (Whites only). Education created protective effects on both functional limitations and depressive symptoms. The extent of COVID-19 concerns and delayed care on the number of depressive symptoms differed across racial ethnic groups. *Conclusion:* Findings from this study can serve as a guide to policymakers and practitioners when developing an integrated treatment and screening mechanism for physical comorbidities and cognitive functioning.

*Keywords:* comorbidities, functional limitations, depressive symptoms, seemingly unrelated regression, COVID-19 concerns, delayed care.

## **Background**

The 2019 novel coronavirus (2019-nCov) spread to over 220 countries worldwide since the first detection in Wuhan, China, on December 31, 2019 (Paules, Marston, & Fauci, 2020). This new strain of coronavirus (i.e., COVID-19) is highly contagious (Wang et al., 2021). In the United States (US), the first travel-related case of the virus was detected in Washington State on January 21, 2020 (Center for Disease Control and Prevention (CDC), 2020). Since then, COVID-19 has caused anything from symptoms that resemble common cold and flu in mild cases to viral pneumonia and fatal organ failure in severe cases. Its mortality rate has exceeded that of the severe acute respiratory syndrome (SARS) (Habibzadeh & Stoneman, 2020). Within a few months, the epicenter of the pandemic shifted from China to Europe and then to the United States. Because of that, on March 13, 2020, President Donald Trump declared the COVID-19 pandemic a national emergency (Liptak, 2020) and the World Health Organization (WHO) declared a pandemic a week later (Ducharme, 2020). By the end of March 2020, eighteen states in the US had issued lockdown/stay-at-home orders (i.e., California, Connecticut, Delaware, Hawaii, Illinois, Indiana, Louisiana, Massachusetts, Michigan, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania, Washington, West Virginia, and Wisconsin) (Hauk & Reyes, 2020).

To date, the COVID-19 pandemic remains one of the most pressing public health issues in US history. As the coronavirus remains an unprecedented health problem in the US and worldwide, it is important to consider the mental health implications of COVID-19. These implications are partly due to social distancing, lockdown/stay-at-home orders, the loss of loved ones, the emergence of new stains, and the loss of income along with other financial stresses associated with this pandemic.

## **Review of Relevant Literature**

Even before the COVID-19 pandemic, a distinguished legacy of research had demonstrated that physical and mental comorbidities may lead to functional limitations and various depressive symptoms. Additionally, functional limitations might have led to various depressive symptoms (Gayman et al., 2008; Hossain et al., 2021; Schieman & Plickert, 2007) by undermining one's ability to maintain social relationships and other support networks. Previous studies also confirmed the association between comorbidities and the developments of functional limitations (Jindai et al., 2016; Kail et al., 2020; Wei et al., 2019) and depressive symptoms (Bi et al., 2021; Erving & Frazier, 2021; Yang et al., 2021).

Numerous empirical studies have been conducted in China, the United States, and the United Kingdom that focus on the mental health implications of the COVID-19 pandemic. The first study attempted to examine how frailty transition and comorbidity affected changes in

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psychological distress among community-dwelling older adults before and after the pandemic (from May 2019 to August 2020) (Wang et al., 2021). Their findings revealed that pre-existing and emerging comorbidities are associated with increased psychological distress during the COVID-19 pandemic (Wang et al., 2021). The second study attempted to examine the associations between social media exposure and mental health problems during the outbreak. Their findings suggested increased exposure to social media correlated to a higher prevalence of mental health problems such as depression and anxiety (Gao et al., 2020). The third study sought to assess the burden of depressive symptoms among US adults before and after the pandemic and to identify the risk factors associated with these symptoms. They found a 2.6-fold increase among those with moderate symptoms, nearly a four-fold increase among those with moderately severe symptoms, and a 7.5-fold increase among those with severe symptoms (Ettman et al., 2020). They also found that the burden of depressive symptoms increased with greater exposure to stressors (e.g., job loss) while the reverse is true for the availability of social and economic resources (Ettman et al., 2020).

Four studies conducted in the US and Europe focused on interethnic and/or gender disparities in different aspects of mental health well-being. Aside from the study conducted in Germany, the other three studies focused on adults 18 and older. In the US, Owens and Saw (2021) analyzed longitudinal data from the Understanding America Study COVID-19 Tracking Survey and found that Black Americans were significantly less likely to report symptoms of anxiety than non-Black Americans even when demographic characteristics, risk perceptions, and baseline pre-pandemic mental health statuses were taken into account. They also found that the prevalence of depression remained stable for non-Black Americans but declined gradually among Black Americans (Owens & Saw, 2021).

In the United Kingdom, Proto and Quintana-Domeque (2021) attempted to compare changes in mental distress before and after the COVID-19 pandemic across ethnic groups and found that the average increases in mental distress were somewhat higher for females and Black, Asian, and minority ethnic (BAME) communities when compared to their male and White British counterparts. They also found that among males, the average increase in mental distress was noticeably higher among Bangladeshi, Indian, and Pakistani when compared to their White British counterparts (Proto & Quintana-Domeque, 2021). Another study in the United Kingdom attempted to examine gender differences in various mental health measures (i.e., anxiety disorder, depression, panic attacks, and loneliness) and found that the scores for women were significantly higher in all four measures than men (Oreffice & Quintana-Domeque, 2021). In Germany, Plenty et al. (2021) focused on late adolescents and young adults found that when compared to native Germans, the decline in psychosomatic somatic complaints were significantly greater among those from the former Soviet Union and Central and Eastern Europe, those from the other European countries and Americas, and those from Turkey, the Middle East, and Africa. Nevertheless, their findings also revealed increased discrimination and health worries

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among respondents from Asia, Turkey, the Middle East, and Africa and greater financial worries among respondents from the other European countries and the Americas (Plenty et al., 2021).

The previous literature demonstrated empirical evidence that denoted the importance of assessing the mental health implications of COVID-19 among those with existing physical and mental comorbidities and functional limitations. Additionally, no studies had considered the physical and mental comorbidities, functional limitations, the extent of COVID-19 concerns, whether they delayed medical and dental care, and whether their work was affected because of the pandemic in their attempt to examine interethnic and gender disparities in depressive symptoms. This is one of the pioneering studies that explores how the impacts of physical and mental comorbidities and functional limitations on depressive symptoms varied by the major racial ethnic groups (i.e., White, Black, and Hispanic) in the US using data from the 2020 Health and Retirement Study (HRS) COVID-10 Project.

### **Methods**

#### **Data**

The empirical work of this study was based on the 2020 Health and Retirement Study (HRS) COVID-19 Project. This project is a collaborative effort between the National Institute of Aging (NIA) and The Social Security Administration (SSA). The survey was conducted by the Institute for Social Research (ISR) Survey Research Center (SRC) at the University of Michigan.

Respondents were given the option of either a telephone or web survey. The midterm release of the 2020 HRS COVID-19 project could be considered a representative sample of the US population aged 50 and over because the COVID-19 module was administered to 50% of the random subsample of households who were originally assigned to face-to-face interviews (Lin & Liu, 2021). This 50% random sample was further divided into two random subsamples, with one being assigned to enhanced face-to-face interviewing (EFTF) assigned to the group that began in June 2020 (i.e., the Early version), and the other being assigned to the group that was scheduled to begin in September 2020 (Lin & Liu, 2020). In other words, the 3,226 respondents from the Early version were part of the random subsample of households originally constituted approximately 25 percent of the original HRS sample. Data from this project was released in November 2020, but psychosocial measures and questionnaires were updated in February 2021.

This data offers several strengths for the purposes of an analytical framework. In addition to collecting current information on demographics, individuals were interviewed in-depth about their physical health, cognition, experiences related to COVID-19, family structures, intergenerational transfers, functional limitations, housing, employment, pension, and retirement and social security. The analyses were limited to individuals who provided information on their age, education, gender, physical and mental comorbidities, functional limitations, depressive

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symptoms, the extent of COVID-19 concerns, whether they delayed medical or dental care, and whether their work was affected because of the pandemic. The final analyses samples consisted of 2,585 individuals (1,634 White, 550 Black, and 401 Hispanic). Only coefficients with  $p \leq 0.05$  were regarded as significant.

### Measures

The dependent variables were assessed by the total number of functional limitations (RG013) and depressive symptoms (the sum of RD110 to RD117) reported by the respondents. The former was a continuous variable measuring the sum of reported difficulties: walking several blocks (RD001), jogging one mile (RD002), walking one block (RD003), sitting for two hours (RD004), getting up from the chair (RD005), climbing stairs (RD006), climbing one flight of stairs (RD007), stooping (RD008), reaching arms (RD009), pushing/pulling large objects (RD010), lifting weights (RD011), and picking up dime (RD012). The latter was also a continuous variable measuring the sum of the following depressive symptoms that asked whether the respondents: felt depressed (RD110), felt that everything they did was an effort (RD111), slept restlessly (RD112), felt happy (RD113), felt lonely (RD114), enjoyed life (RD115), felt sad (RD116), and felt like they could not get going (RD117).

The independent variables included age, education level, sex, physical and mental comorbidities, the extent of COVID-19 concerns, whether they delayed medical or dental care, and whether their work was affected because of the pandemic. Age was treated as a continuous variable. Sex was formulated as a dichotomy for males (reference category) and females. Education level was represented as not a high school graduate (reference category), high school or GED, some college, and at least a bachelor's degree. Physical and mental comorbidities was a continuous variable measuring the co-occurrence (sum of) of multiple diagnosed physical and mental health conditions in an individual. The illnesses included were high blood pressure, diabetes, cancer of any kind (except for skin), lung disease, heart condition, stroke, emotional/psychiatric problems, Alzheimer's disease, and arthritis. With respect to the extent of COVID-19 concerns, an individual responded on a 10-point scale from one being the least concerned to 10 being the most concerned. Delayed medical or dental care and whether work was affected because of the pandemic were indicated by dummy variables for No (reference category) and Yes.

### Analytic Strategy

The objective of this study was assessed using the seemingly unrelated regression (SUR). The models were formulated as:

$$Functional\_Limitations = \beta_0 + \sum_{i=1}^n \beta_{Demographics} + \beta_{Comorbidities} + \varepsilon_1$$

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### *Depressive\_Sumptoms*

$$= \beta_0 + \sum_{i=1}^n \beta_{Demographics} + \beta_{Comorbidities} + \beta_{Functional\_Limitations} \\ + \beta_{COVID\_Concern} + \beta_{Delayed\_Care} + \beta_{Work\_Affected} + \varepsilon_2$$

In this case,  $\sum_{i=1}^n \beta_{Demographics}$  was the vector of regression coefficients for age, sex, and the level of education and  $\varepsilon_i$  was the error term with mean = 0 and variance =  $\sigma^2$ . The two equations seemed unrelated, but it was possible that unobserved individual effects can impact both dependent variables. Including two separate ordinary least squares (OLS) regressions was inappropriate because several demographic characteristics (age, sex, and education), the number of physical and mental comorbidities, and experiences pertaining to COVID-19 might share some common, unmeasured causes that could similarly influence measures pertaining to functional limitations and depressive symptoms. The correlation between the error terms in these two equations could not be accounted for by the OLS regression (Washington et al., 2011). Thus, the inclusion of two separate equations could result in contemporaneous correlation among error terms (Zellner, 1962) as the covariance for both the functional limitations and depressive symptoms equations might be related through their correlation in the error terms and is constant across all observations (Frankenberg et al., 2005).

As such, SUR, a structural equation technique, was used to simultaneously estimate the two outcome variables that share some common, unmeasured causes while considering the correlated error structures. SUR proceeded in two-steps. In the first step, pooled OLS used estimates to calculate the covariance of error terms across different investment outcomes (Ajmani, 2009). In the second step, the feasible generalized least squares (GLS) were applied to the system of equations as a solution to correlated error structures (Ajmani, 2009). This technique was appropriate because the feasible GLS approach could be used to relax the assumption of uncorrelated error terms by using a matrix that account for correlated error terms (Washington, et al., 2011). As such, SUR was superior to the equation-by-equation OLS model because it provided a more robust parameter estimates of coefficients, standard errors, and covariance, yielding more efficient F tests.

Because previous studies have found that the different aspects of mental health well-being vary across racial ethnic groups (Owens & Saw, 2021; Plenty et al., 2021; Proto & Quintana-Domeque, 2021), three separate but identical SUR models – one for White respondents, one for Black respondents, and one for Hispanic respondents, were estimated because the aim of this study is to assess whether the impacts of demographic characteristics (age, sex, and education level), physical and mental comorbidities, functional limitations, the extent of COVID-19 concerns, delaying care, and work disruption on depressive symptoms vary across racial ethnic groups.

## Results

### Descriptive statistics

As shown in Table 1, the mean age for White respondents was significantly higher than Black respondents (67.67 vs. 63.13). There were somewhat more female and White respondents in the sample, but the percentages of gender did not significantly vary across racial ethnic groups. There were significant differences in the percentages of individuals in each level of education across racial ethnic group. There were no significant differences in the number of physical and mental comorbidities across racial ethnic group. Black respondents had a significantly higher number of functional limitations and depressive symptoms when compared to White respondents. On average, the extent of COVID-19 concerns was significantly higher among Black and Hispanic respondents when compared to White respondents. Likewise, the average extent of COVID-19 concerns was significantly higher for Black when compared to Hispanic respondents. There were no significant racial ethnic differences in the percentages of respondents who delayed care. The percentage of respondents who indicated that their work was affected because of the pandemic was significantly higher among Hispanic when compared to Black respondents.

**Table 1**

*Descriptive statistics (Mean (SD) or %)*

Variables	White (n = 1,634)	Black (n = 550)	Hispanic (n = 401)
Age <sup>a,b</sup>	67.67 (10.38)	63.13 (9.22)	62.97 (9.46)
Sex			
Male	42.36%	38.39%	39.78%
Female	57.64%	61.61%	60.22%
Level of schooling <sup>a,b,c</sup>			
Not a high school graduate	7.03%	19.57%	41.63%
High school / GED	50.27%	48.93%	42.82%
Some college	7.46%	7.65%	4.31%
At least a bachelor's degree	35.23%	23.84%	11.24%
# of physical & mental comorbidities	3.02 (1.92)	3.08 (1.83)	2.81 (1.93)
# of functional limitations <sup>a,b</sup>	2.30 (2.67)	3.01 (3.10)	2.75 (2.99)
# of depression symptoms <sup>a,b</sup>	2.67 (1.29)	3.06 (1.54)	3.08 (1.51)
Extent of COVID-19 concerns <sup>a,b,c</sup>	7.32 (2.66)	8.76 (2.35)	8.21 (2.56)
Delayed care	30.55%	30.91%	26.70%
Work affected <sup>b,c</sup>	25.38%	27.60%	35.07%

<sup>a</sup> Significant difference between Black and Whites; <sup>b</sup> Significant difference between Hispanics and Whites; <sup>c</sup> Significant difference between Black and Hispanics.

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As shown in the first panel of Table 2, the percentages of individuals who were being diagnosed with high blood pressure were significantly higher among Black individuals when compared to Whites and Hispanic respondents, and among Black respondents when compared to Hispanics. The percentages of individuals who were being diagnosed with diabetes, any type of cancer (except for skin), and emotional/psychiatric problems were significantly lower for White individuals when compared to Black and Hispanic respondents. The percentages of individuals who were being diagnosed with lung disease, stroke, and arthritis were significantly higher for Hispanic than White respondents and for Black than Hispanic individuals. There were significant differences in the percentages of individuals diagnosed with heart condition across racial ethnic group. The percentage of individuals who were being diagnosed with depression was significantly higher for Black individuals when compared to White individuals. There were no significant differences in the percentages of individuals diagnosed with Alzheimer's disease across racial ethnic group.

**Table 2**

*Percentages of comorbidities, functional limitations, and depressive symptoms by race/ethnicity*

<b>Physical &amp; mental comorbidities</b>			
<b>Variables</b>	<b>Whites (n = 1,634)</b>	<b>Blacks (n = 550)</b>	<b>Hispanics (n = 401)</b>
High blood pressure <sup>a,c</sup>	59%	79%	61%
Diabetes <sup>a,b</sup>	24%	36%	39%
Cancer except for skin <sup>a,b</sup>	20%	11%	10%
Lung disease <sup>b,c</sup>	11%	12%	7%
Heart condition <sup>a,b,c</sup>	28%	23%	14%
Stroke <sup>b,c</sup>	9%	10%	5%
Emotional/psychiatric problems <sup>a,b</sup>	22%	18%	21%
Depression <sup>a</sup>	23%	21%	23%
Alzheimer's disease	1%	2%	1%
Arthritis <sup>b,c</sup>	65%	62%	52%
<b>Functional limitations</b>			
<b>Variables</b>	<b>Whites (n = 1,634)</b>	<b>Blacks (n = 550)</b>	<b>Hispanics (n = 401)</b>
Difficulty walking several blocks <sup>a,c</sup>	29%	36%	29%
Difficulty sitting (2 hrs.) <sup>a,b</sup>	16%	22%	26%
Difficulty getting up from chair <sup>a,c</sup>	34%	43%	35%
Difficulty climbing stairs <sup>a</sup>	41%	47%	44%
Difficulty stooping	45%	46%	44%
Difficulty reaching arms <sup>a,b</sup>	13%	22%	21%
Difficulty pull/push large objects <sup>a,b</sup>	22%	36%	31%
Difficulty lifting weights <sup>a</sup>	22%	31%	26%

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Difficulty picking up dime	5%	5%	5%
<b>Depressive symptoms</b>			
<b>Variables</b>	<b>Whites (n = 1,634)</b>	<b>Blacks (n = 550)</b>	<b>Hispanics (n = 401)</b>
Felt depressed <sup>a,b</sup>	9%	15%	16%
Everything was an effort <sup>a,b,c</sup>	17%	38%	27%
Sleep was restless <sup>b</sup>	25%	30%	34%
Happy	88%	85%	85%
Lonely	15%	19%	20%
Enjoyed life <sup>a,c</sup>	90%	93%	87%
Sad <sup>b</sup>	17%	20%	24%
Could not get going	18%	17%	20%

<sup>a</sup> Significant difference between Black and Whites; <sup>b</sup> Significant difference between Hispanics and Whites; <sup>c</sup> Significant difference between Black and Hispanics.

As shown in the middle panel of Table 2, the percentages of individuals who were having difficulty walking several blocks and getting up from a chair were significantly higher among Black individuals when compared to White individuals and among Black respondents when compared to Hispanic respondents. The percentages of individuals who were having difficulty sitting for two hours, reaching their arms, and pushing/pulling large objects were significantly lower for White respondents when compared to Black and Hispanic respondents. The percentages of individuals who were having difficulty climbing stairs and lifting weights are significantly higher for Black than White respondents. There were no significant differences in the percentages of individuals who were having difficulty stooping and picking up dime across racial ethnic group.

As shown in the bottom panel of Table 2, the percentages of individuals who felt depressed was significantly lower for White individuals when compared to Black and Hispanic individuals. There were significant differences in the percentages of individuals who felt that everything was an effort across racial ethnic group. The percentages of individuals who felt that sleep was restless and who felt sad were significantly higher for Hispanic when compared to White respondents. There were no significant differences in the percentages of individuals who felt happy, lonely, or could not get going across racial ethnic group. The percentage of individuals who indicated that they enjoyed life was significantly higher for Black than White individuals and for Black than Hispanic respondents.

### Multivariate analysis

Results from the seemingly unrelated regression were presented in Table 3. The number of functional limitations and depressive symptoms increased with age for White and Hispanic respondents. The number of depressive symptoms increased with age for Black individuals.

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White women had significantly more functional limitations and depressive symptoms than their male counterparts. Black and Hispanic women had significantly more functional limitations than their male counterparts.

The expected number of functional limitations and depressive symptoms for White and Black individuals with a high school diploma or GED and beyond was significantly lower than their counterparts without a high school diploma. Findings also revealed that for Hispanics, the expected number of functional limitations for those with a high school diploma or GED and the expected number of depressive symptoms for those with some college education were significantly lower than their counterparts with not a high school graduate.

The expected number of functional limitations and depressive symptoms increased with the number of physical and mental comorbidities and functional limitations for all racial ethnic groups. The number of depressive symptoms increased with the extent of COVID-19 concerns for all racial ethnic groups, as well. The expected number of depressive symptoms was significantly among Whites who delayed care.

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**Table 3**

*Results from seemingly unrelated regression*

Variables	Whites (n = 1,634)		Blacks (n = 550)		Hispanics (n = 401)	
	# of functional limitations	# of depression symptoms	# of functional limitations	# of depression symptoms	# of functional limitations	# of depression symptoms
Age	0.039*	-0.018*	0.017	-0.031*	0.044*	-0.026*
Sex						
Male (Ref.)						
Female	0.564*	0.142*	1.034*	0.173	0.709*	0.078
Level of schooling						
Not a high school graduate (Ref.)						
High school / GED	-0.780*	-0.306*	-1.319*	-0.668*	-0.638*	0.036
Some college	-1.101*	-0.314*	-1.402*	-0.797*	0.914	-0.739*
At least a bachelor's degree	-1.551*	-0.474*	-2.465*	-0.934*	-0.624	0.070
# of physical & mental comorbidities	0.539*	0.106*	0.721*	0.128*	0.673*	0.106*
# of functional limitations		0.081*		0.113*		0.139*
Extent of COVID-19 concern		0.061*		0.083*		0.067*
Delayed care		0.297*		0.178		0.290
Work affected		-0.104		0.120		-0.124
Intercept	-1.301*	3.326*	0.469	3.989*	-2.049*	0.400*
Adj. R-square	0.277	0.138	0.294	0.194	0.274	0.156

\* p <= 0.05

## Discussion

The findings of this study suggested that physical and mental comorbid conditions, functional limitations, and depressive symptoms co-occur more commonly than expected for all racial ethnic groups. Partially, this was because bodily aches and pains might co-occur with most physical and mental health conditions and these physical health problems might undermine one's functional performance. Additionally, physical and mental health problems and functional limitations might lead to all kinds of depressive symptoms by undermining one's sense of control and ability to maintain interpersonal relationships and social support networks.

Females fared worse than males in terms of functional imitations for all racial ethnic groups. This finding was in line with recent studies conducted in the United Kingdom (Bloomberg et al., 2021), Spain (Garin et al., 2014), and the US (Thielke et al., 2015). Findings also revealed that white females fared worse their male counterparts in terms of depressive symptoms. Black women were less likely than their White counterparts to report depression partly because they faced greater barriers to mental health treatment, especially for those who live in the rural areas (Weaver et al., 2015). Previous studies have also attributed women's higher susceptibility to mental health disorders to the gender inequality that exposed women to role-related stresses. These stresses can include being the "sandwiched" multigenerational caregivers (Patterson & Margolis, 2019) and feelings of underappreciated and undervalued (Hegelson, 1994), sexual assaulted or being pressured into unwanted sexual contact (Weiss et al., 1999). Their greater tendencies to engage in ruminations when distressed (Nolen-Hoeksema et al., 1999) due to their relatively low socioeconomic statuses (Rai et al., 2013) and physical strength (Albert, 2015). Women faring worse in depressive symptoms could also be partly attributed to women being more sensitive to interpersonal relationships (Kendler & Gardner, 2014) due to the gender differences in personality traits (Albert, 2015) and to hormonal changes, which subsequently led to gender-specific forms of depression such as premenstrual dysphoric disorder and postpartum and post-menopausal depression and anxiety (Albert, 2015). The higher number of depressive symptoms among women might also be due to males being less likely to report depressive symptoms due to the existing gender-based stereotypes.

Consistent with findings of previous studies in the US (McFarland & Wagner, 2015), Europe (Chlapecka et al., 2020), Japan (Hinata et al., 2020), and Canada (Rudenstine et al., 2021), education had protective effects on both functional limitations and depressive symptoms. This suggested that education might be protective against functional limitations and depressive symptoms by increasing an individual's sense of mastery as it provided the necessary resources and abilities to handle various stresses in life (McFarland & Wagner, 2015). These resources could be tangible (i.e., income, assets ownership, wealth accumulations, better understanding of prescription, medical treatment and other health promotion behaviors, access to rehabilitation services and other health education programs, etc.) or intangible (i.e., job fulfillment, ability to

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pursue meaning in life or cope with stressful events, occupational prestige, work conditions, financial security, quality of life, and sense of control, autonomy, and efficiency in one's personal life and at work) (Chlapecka et al., 2020; Mirowsky & Ross, 2003). It also appeared that the protective effects of education on the number of depressive symptoms worked through personality traits such as the levels of extroversion and conscientiousness (McFarland & Wagner, 2015).

Consistent with the findings of Lin and Liu (2021), the positive effects of the extent of COVID-19 concerns were stronger among Black respondents and to a much lesser extent, among Hispanic respondents, when compared to White individuals. This could be attributed to Black and Hispanic respondents being disproportionately affected by the pandemic (Center for Disease Control and Prevention, 2022; Laeyendecker et al., 2021; Misa et al., 2021), patient hospitalized (Romano et al., 2021), and their higher burdens of COVID-19 deaths (Price-Haywood et al., 2020; Wadhwa et al., 2020). Black and Hispanic individuals were also more concerned that they would be hospitalized due to the coronavirus or transmit the virus to others when compared to White respondents (Pew Research Center, 2020) because they were disproportionately exposed to the health risks associated with COVID-19 (Kim & Bostwick, 2020). Partly resulting from systemic discrimination, racism, and other forms of structural inequalities, Black and Hispanic individuals were more likely to reside in high poverty areas of being uninsured or underinsured (Poteat et al., 2020).

Delayed medical or dental care having a positive effect on depressive symptoms for White respondents could be attributed to interethnic disparities in socioeconomic statuses (Williams & Mohammed, 2013), access and continuity in healthcare, and the type of health coverage remain for older adults (Bulatao & Anderson, 2004). Recent studies showed that Black and Hispanic individuals had greater likelihood of having delayed or limited access to healthcare and COVID-19 testing (Poteat et al., 2020; Tai et al. 2021). This finding could be partly attributed to the fact that Black Americans were 1.5 times more likely than White Americans to be underinsured or uninsured (Artiga et al., 2019) or to have private insurance (Bulatao & Anderson, 2004). Black Americans were more likely to be recipients of Medicare and Medicaid than White Americans and therefore had fewer dental, long-term care, and specialists visits, yet were more likely to postpone care or receive care from nonoptimal settings such inpatient care and emergency rooms (Bulatao & Anderson, 2004).

## Conclusion

This study was timely and warranted because older adults with physical and mental comorbidities, functional limitations, and depressive symptoms might pose a particular challenge for health systems. Implementation of treatment, prevention, and other intervention and self-management programs should focus on Black and Hispanic Americans, women, and those with

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low levels of education to reduce barriers to care experienced by some of these individuals and the economic burden of healthcare for the older adults. Medical professionals and healthcare administrators should also focus on improving their care coordination by integrating the primary care with routine screenings for functional limitations and depressive symptoms.

Efforts to delay and prevent functional loss and subsequently to delay or prevent the occurrence of permanent disablement should also be given to women because they fared worse than their male counterparts in functional limitations. Therefore, a comprehensive understanding of different gender roles and social norms across racial ethnic groups will facilitate the design of effective policies and programs to help women maintain good mental health. Progress can be made by promoting early screening for women. Identifying the obstacles faced by Black and Hispanic individuals and attempt to increase their mental health awareness in healthcare utilization will be crucial to reducing and preventing the under-recognition and under-treatment of various mental health disorders for these individuals. Patient-centered and community-based mental health care and counseling services may be other viable treatment options to help women cope with stress. The use of gender-specific preventive strategies and self-help management programs are also warranted.

Policy measures directed at maintaining functional performance and mental health functioning among the less educated should be continued. Implementing programs to facilitate a timely and appropriate health seeking process early on in life has the potential to mitigate the negative consequences of educational inequality on functional and mental decline later in life. Identifying the obstacles faced by these individuals will be crucial to reduce the detrimental effects of health inequality.

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