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The Association between Social Determinants of Health and Depressive Disorders: A 2017 Behavioral Risk Factor Surveillance System (BRFSS) Analysis

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Abstract: Background: Major Depressive Disorder is a leading cause of disability worldwide and one of the most common disorders in the United States. Contributors to an individual's risk for experiencing depressive disorders include individual and social factors. Although the social determinants of health (SDOH) are conditions that contribute to healthy functioning, health outcomes, and quality of life, it is unclear to what extent adverse SDOH experiences are associated with self-reporting depressive disorder (DD). Methods: Data from the 2017 Behavioral Risk Factor Surveillance System (BRFSS), a population-based telephone survey of noninstitutionalized U.S. adults, was employed in this study. Lifetime diagnosis of DD was self-reported among survey participants who also completed the Social Determinants of Health optional module within 17 participating BRFSS states and entities. Rao-Scott chi-square analysis was used to determine the association of individual and SDOH measures with DD. Results: The prevalence of DD among participating states was 19.85%. Among respondents, significant proportional differences were observed for each SDOH indicator regarding DD status. However, significant differences in health insurance coverage were not observed. Conclusion: Survey respondents with a lifetime diagnosis of DD experienced adverse SDOH conditions in greater proportion than individuals not reporting DD. Individual and community-based approaches to address the contextual influences of depressive disorders should be aggressively implemented.

Keywords: depressive disorders; social determinants of health; mental health

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1. Introduction

Major depression is the most common mental illness among adults in the United States [1] and is the leading cause of disability globally [2]. Impacting approximately 280 million people globally [2], within the United States (U.S.), an estimated 21.0 million adults experience at least one major depressive episode annually [1]. Major depressive episodes are associated with poor physical health and functioning, resulting in a spectrum of short-term to long-term disability [3–8]. In the U.S., 6% (14.8 million) of adults reported severe impairment due to having at least one depressive episode in 2020 [1]. Among U.S. adults experiencing a major depressive episode in 2020, 66% received treatment. Moreover, estimates that year found when experiencing severe impairment, 71% of U.S. adults received treatment [1]. Still, receiving treatment may be challenging for some Americans, as an estimated 11% of individuals experiencing a mental illness are uninsured [9].

Previous investigations of depression have linked increased risk of depression with age, sex, and race/ethnicity [5,6,8,10,11]. In 2020, data from the National Institute of Mental Health (NIMH) reported depression was most prevalent in adults ages 18–25 (17%) and was most often diagnosed in females (10.5%) compared to males (6.2%) [1]. The prevalence of depression for persons who identify as White, Black or African American, and Hispanic were 9.5%, 6%, and 7%, respectively; however, those who identified as 2 or more races had

a depression prevalence of 15.9% which may be attributed to this population being exposed to factors that increase their risk for major depressive disorders [1].

Factors that may increase an individual's susceptibility and affect a wide range of health, functioning, and quality-of-life outcomes and risks, such as mental disorders, are known as the social determinants of health (SDOH) [12]. Defined as "conditions in the environments where people are born, live, learn, work, play, worship, and age", SDOH may detract from optimal mental health and increase the risk for mental illnesses [13]. SDOH, such as food security, crime, and housing stability, are also linked to health disparities such as depression, stress, and chronic disease [14–17]. The degree to which depression impacts daily functioning is directly related to socio-economic status, lesser educational accomplishment, and family status [18], likely due to more frequent stressful experiences.

Stress is linked to instances of severe depression and is frequently present during the beginning of severe depressive episodes [19]. Individuals experiencing major life events or maintaining difficult schedules were twice as likely to be depressed [20–22]. Additionally, among those who suffer from depression, stressful life events are linked to more severe symptoms, a longer illness duration, and a higher risk of relapsing [23]. Previous studies show varied results when assessing the association of financial hardship/insecurity with common mood disorders such as depression. Lorant and Deliège [24] completed a meta-analysis assessing the socio-economic status of persons diagnosed with depression. They found that when comparing high and low income, those with low income were at increased risk for depression. Some studies show a synchronous association between mental health and financial hardship [10,25–29], while other studies show that the incidence of mental health disorders is not a direct result of financial hardship, but rather the hardship perpetuates the maintenance of mental illness [24,26,30–32].

Housing insecurity is likely the social determinant of health with the greatest potential influence on world health [33]. Housing insecurity or instability refers to a continuum of housing experiences, including but not limited to homelessness, foreclosure, frequent moving, crowding, and high housing cost in proportion to one's household income [33]. Millions of Americans each day are impacted by housing instability. According to Jelleyman and Spencer [34], over 21 million Americans pay 30% to 50%, and nearly 19 million households pay more than 50% of their income in housing costs. The long-term health outcomes associated with housing insecurity include illicit drug use, increased rates of depression, and poor emotional adjustment [33]. Additionally, low-income, minority, single, and middle-aged adults are more likely to report housing insecurity. According to Wright, Rubin [35], the rate of serious mental illness (SMI) among homeless people is considerably higher than that reported in the housed population, with one study indicating one-third of the adult homeless population has been diagnosed with SMI [36]. Related to crime, several studies have documented adverse mental health outcomes due to prior traumatic exposure, residential instability, and crime [37–41]. An individual's perception of feeling unsafe due to a neighborhood's violent crimes is positively associated with higher levels of depressive symptomology [42].

Increased scientific literature has investigated the linkage between depressive symptomology and food insecurity [13]. Food insecurity refers to the inability or limited ability to obtain safe and adequate nutritious food in socially accepted ways [43]. According to the U.S. Department of Agriculture [44], approximately 10.2% of American households experience various levels of struggle with accessing food. A growing body of literature has suggested a strong association between food insecurity and mental health problems before and during the COVID-19 pandemic. People who scramble to acquire food are likely to experience consistent stress, which serves as a contributing factor to various mental disorders [13]. However, population-based data in understanding food hardship associated with mental health is limited [45].

Although many studies of depression have investigated relationships with sociodemographic and other individual factors [1,6–8], few studies have focused attention on the occurrence of adverse SDOH conditions in association with depressive disorder

(DD). Thus, to better understand the relationship between DD and experiences of adverse conditions of SDOH, we used data from the 2017 Behavioral Risk Factor Surveillance System (BRFSS). Studies have used the 2017 BRFSS to examine specific SDOH experiences among specific people groups [46] or related to specific health outcomes [47–50]. Our analysis examines the relationship of self-reported lifetime diagnosis of DD with individual and contextual factors such as neighborhood safety, food insecurity, housing insecurity, financial insecurity, and stress using data from 17 participating states employing the optional BRFSS Social Determinants of Health module. Examining these relationships will inform public/community health practices in support of better mental health outcomes.

2. Materials & Methods

2.1. Study Design

In this cross-sectional study, we utilized data obtained from the 2017 BRFSS, with a focus on participants who responded to the Social Determinants of Health (SDOH) optional module implemented in 17 U.S. states (i.e., Colorado, Florida, Georgia, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Mississippi, New Hampshire, Ohio, Oklahoma, Pennsylvania, Utah, West Virginia, Wisconsin, and Wyoming). The BRFSS is an annual, state-based, nationally representative, computer-assisted telephone survey conducted by the Centers for Disease Control and Prevention (CDC) across all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam, which targets noninstitutionalized U.S. adults (i.e., civilian population excluding individuals residing in certain institutions, e.g., nursing homes, prisons, correctional facilities, etc. according to https://www.cdc.gov/nchs/hus/sources-definitions/population.htm (accessed on 12 March 2021). All participants were 18 years and older. Complete information about the sampling methodology can be found at https://www.cdc.gov/brfss/ (accessed on 12 March 2021). The core questionnaire ascertains information on chronic health conditions, health status, health-related risk behaviors, healthcare access, demographic and socio-economic characteristics. It is administered in all states and territories. In addition, each state may choose to administer optional BRFSS modules on specific topics, such as the Social Determinants of Health module, which was only administered once in 2017. Consequently, we analyzed the 2017 BRFSS data, taking advantage of the only opportunity to examine the SDOH indicators associated with a lifetime diagnosis of DD among a large concentration of states. The total sample size for the 2017 BRFSS was 450,016 [51], and the median state-level response rate was 45.3% landline and 44.5% cell phone [52]. This analysis of anonymized BRFSS survey data is publicly available and required no review by the university institutional review board.

2.2. Participants

In 2017, 17 states and entities administered the module of questions measuring SDOH indicators, which included financial hardship, neighborhood safety, food stability, and stress measures, in addition to the core questionnaire. The sample was further restricted to participants with complete data on outcome variables and a self-reported lifetime diagnosis of DD. Thus, we excluded respondents from the analysis who had incomplete data on DD (n = 663). Further, we excluded respondents because of missing values in any of the study variables or if they had responses of "don't know" or "refused". We excluded all respondents without complete information for all other study variables, which yielded an analytic sample of 82,659 respondents.

2.3. Measures

Outcome variable. The outcome variable for this study was a lifetime diagnosis of DD. The BRFSS used the measure "Has a doctor, nurse, or other health professional EVER told you that you had any of the following?—(Ever told) you have a depressive disorder, including depression, major depression, dysthymia, or minor depression?" with reporting options "Yes", "No", "Don't know/Not sure", and "Refused" to estimate ever having a

depressive disorder among U.S. adults. Respondents indicating "Don't know/Not sure" and "Refused" were excluded from the analysis.

Individual determinants. Data from the survey was collected on the following variables: participant age (grouped as 18–34, 35–54, 55–64, and 65 or above), sex (male or female), race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and non-Hispanic Other), marital status (married or unmarried), education level (did not graduate high school, graduated high school/GED, and greater than high school education), employment status (employed, unemployed, and retired/students) and household income (<$25,000, $25,000–$49,999, $50,000–$74,999, and $75,000+). In addition to sociodemographic variables, health variables were considered. General health status was assessed by the single measure "Would you say that in general your health is-". The variable responses were reclassified from five (excellent, very good, good, fair, poor) into three categories (fair/poor vs. good/very good vs. excellent). Other health care measures included years since having received a medical checkup (1, 2, 3–5, 5+), experiencing a time in the past 12 months when the respondent needed a doctor but could not see one because of costs (yes vs. no), and having health insurance (yes vs. no).

Social determinants. Social determinants of health questions were transformed into measures of social risk factors, otherwise known as adverse conditions, associated with poor health [53,54]. Measures depicted financial insecurity, housing instability, neighborhood safety, food and balanced meal insecurity, financial insecurity, and stress level (Table 1).

Table 1. Social Risk Factor Measures from the 2017 BRFSS.

SDOH Variable (BRFSS Variable Label)	Response Coding per BRFSS Variable	BRFSS Questionnaire Text
Inability to Pay Bills Were you not able to pay your bills?	Yes No	During the last 12 months, was there a time when you could not pay your mortgage, rent, or utility bills?
Housing Insecurity How many times have you moved?	Yes = ≥2 Moves No = <2 Moves	In the last 12 months, how many times have you moved from one home to another?
Neighborhood Safety Neighborhood Safe From Crime	Unsafe = Unsafe or extremely unsafe, Safe = Extremely safe or safe	How safe from crime do you consider your neighborhood to be?
Food Insecurity No money for food?	Yes = Often or sometimes true, No = Never true	The first statement is, "The food I bought just didn't last, and I didn't have money to get more." Was that often, sometimes, or never true for you in the last 12 months?
Inability to Afford Balanced Meals No money for balanced meals?	Yes = Often or sometimes true, No = Never true	"I couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months?
Finances at End of Month How do your finances usually work out at the end of the month?	Not Enough = Not having enough money to make ends meet, Enough = Have just enough money to make ends meet, Excess = End up with some money left over	In general, how do your finances usually work out at the end of the month?
30 Day Frequency of Stress How often have you felt this kind of stress?	None = None of the time, Little = A little of the time, Some = Some of the time, Most = Most of the time, or All of the time	Within the last 30 days, how often have you felt this kind of stress?

BRFSS variables, variable labels, and questions in Table 1. are derived from the 2017 Behavioral Risk Factor Surveillance System Questionnaire (https://www.cdc.gov/brfss/questionnaires/pdf-ques/2017_BRFSS_Pub_Ques_508_tagged.pdf (accessed on 15 January 2023).

2.4. Analysis

We used survey weights to account for the complex survey design and obtain representative results. The 82,659 participants in the sample represent an estimated 49.96 million U.S. adults. We performed a Rao-Scott chi-square analysis to determine proportional statistics and measure the association of individual and SDOH measures with DD. A 2-sided *p*-value of 0.05 was set as statistically significant. SAS software was used for all analyses [55].

3. Results

Sample Characteristics

A total of 82,659 respondents with non-missing information on all the variables used in the study were included in the analysis. Table 2 presents the study sample characteristics. Overall, more respondents were non-Hispanic White (73.8%), female (51.0%), married (53.7%), employed (59.9%), and had a higher than a high school degree (62.0%) education level (Table 2). Approximately 40% of respondents were aged 55 years and older, and 35% of respondents had household incomes greater than $75,000. Furthermore, the majority of the respondents were able to pay their mortgage, rent, or utility bills (90.4%), didn't move or moved less than two times from one home to another (96.4%), and had enough money for food (84.2%) during the last twelve months. Related to health status, 64.4% reported their health as good or very good, 90.4% had health insurance, 72.7% had a routine checkup within the past year, and not seeing a doctor due to costs was experienced by 12%. An estimated 19.9% of respondents self-reported a lifetime diagnosis of DD (Table 2).

Table 2. Characteristics of Study Participants, BRFSS 2017, United States.

Characteristics	Unweighted Sample Size, N = 82,659	Weighted Percentage N = 49,958,706	Weighted 95% CI
Age (Years)			
18–34	12,227	25.72	25.09–26.35
35–54	23,751	34.08	33.45–34.71
55–64	18,905	18.59	18.12–19.05
65+	27,776	21.62	21.15–22.08
Gender			
Female	45,136	50.92	50.27–51.58
Male	37,523	49.08	48.42–49.73
Race/Ethnicity			
Hispanic	4158	9.44	8.90–9.98
Non-Hispanic Black	5689	11.56	11.08–12.03
Non-Hispanic White	69,396	73.80	73.12–74.47
Non-Hispanic Other	3416	5.21	4.90–5.52
Marital Status			
Married	45,826	53.66	53.01–54.32
Partnered	2419	4.47	4.16–4.78
Divorce/Widowed/Separated	22,605	20.78	20.29–21.27
Never Married	11,809	21.09	20.50–21.68
Education			
>High School	56,117	61.77	61.11–62.43
=High School/Graduate	22,000	28.80	28.19–29.41
<High School	4542	9.42	8.96–9.89
Employment Status			
Employed	43,780	59.93	59.30–60.56
Unemployed	9047	11.40	10.98–11.81
Retired/Homemaker/Status	29,832	28.68	28.11–29.25

Table 2. *Cont.*

Characteristics	Unweighted Sample Size, N = 82,659	Weighted Percentage N = 49,958,706	Weighted 95% CI
Household Income			
<$25,000	19,992	24.68	24.10–25.26
$25,000–$49,999	20,633	24.66	24.08–25.23
$50,000–$74,999	13,813	15.86	15.40–16.33
$75,000+	28,221	34.80	34.19–35.41
Inability to Pay Bills			
No	76,029	90.32	89.92–90.72
Yes	6630	9.68	9.28–10.08
Housing Insecurity			
No	80,503	96.39	96.11–96.68
Yes	2156	3.61	3.32–3.89
Neighborhood Safety			
Safe	79,395	94.66	94.32–95.00
Unsafe	3264	5.34	5.00–5.68
Food Insecurity			
No	72,122	84.24	83.73–84.76
Yes	10,537	15.76	15.24–16.27
Inability to Afford Balanced Meals			
No	70,646	82.43	81.91–82.95
Yes	12,013	17.57	17.05–18.09
Finances at End of Month			
Excess	47,977	54.76	54.10–55.41
Enough	28,378	36.63	36.00–37.27
Not Enough	6304	8.61	8.23–8.99
30-Day Frequency of Stress			
None	36,352	41.48	40.83–42.12
Little	23,132	27.76	27.18–28.34
Some	14,117	18.29	17.78–18.81
More	9058	12.47	12.02–12.91
General Health			
Excellent	13,997	18.24	17.71–18.76
Very good/good	53,907	64.40	63.77–65.04
Fair/Poor	14,755	17.36	16.86–17.86
Did Not See Doctor Due to Cost			
No	73,968	87.56	87.11–88.00
Yes	8691	12.44	12.00–12.89
Check Up (Years)			
1	62,608	72.74	72.15–73.33
2	9427	12.36	11.93–12.80
3–5	5418	7.79	7.43–8.15
5+	5206	7.11	6.77–7.44
Health Insurance			
No	6032	9.62	9.20–10.04
Yes	76,627	90.38	89.96–90.80
Lifetime Depressive Disorders			
No	65,475	80.15	79.64–80.66
Yes	17,184	19.85	19.34–20.36

Table 3 depicts the relationship between self-reporting a diagnosis with DD during their lifetime and socio-demographic variables, including experiences of SDOH measures

during the past 12 months, among U.S. adults. Within the sample, a significantly greater proportion of respondents reporting DD were ages 35–54 (35%) and female (64%) (Table 2). The majority of persons categorized with DD during their lifetime were non-Hispanic White (78.7%), married (43.8%), had above a high school education (59.2%), employed (47.8%), and a household income of less than $25,000 (36.7%) (Table 3). Significant proportional differences were observed for adverse SDOH experiences within the past 12 months, as 21% of participants categorized with ever having DD reported inability to pay mortgage, rent, or utility bills. Additionally, 6.6% of participants categorized with a lifetime diagnosis of DD reported housing insecurity, 9.2% reported feeling unsafe in their neighborhood, 34% reported inability to afford balanced meals, 19.6% reported not having enough money at the end of the month, and 35.4% reported being stressed most of the time during the past 12 months (Table 3).

Table 3. Self-reporting a lifetime diagnosis of depressive disorders status by socio-demographic and SDOH factors, BRFSS 2017.

	Depressive Disorders		
	% Yes	**% No**	***p*-Value**
Age (Years)			<0.0001 **
18–34	28.06	25.14	
35–54	35.01	33.85	
55–64	20.33	18.16	
65+	16.61	22.86	
Gender			<0.0001 **
Female	63.88	47.71	
Male	36.12	52.29	
Race/Ethnicity			<0.0001 **
Hispanic	7.77	9.85	
Non-Hispanic Black	8.56	12.30	
Non-Hispanic White	78.70	72.58	
Non-Hispanic Other	4.96	5.27	
Marital Status			<0.0001 **
Married	43.88	56.09	
Partnered	5.55	4.20	
Divorce/Widowed/Separated	27.26	19.17	
Never Married	23.32	20.54	
Education			<0.0001 **
>High School	59.18	62.42	
=High School/Graduate	28.82	28.80	
<High School	12.00	8.79	
Employment Status			<0.0001 *
Employed	47.78	62.94	
Unemployed	25.74	7.84	
Retired/Homemaker/Status	26.48	29.22	
Household Income			<0.0001 **
<$25,000	36.68	21.71	
$25,000–$49,999	25.13	24.54	
$50,000–$74,999	14.17	16.28	
$75,000+	24.02	37.46	
Inability to Pay Bills			<0.0001 **
No	79.19	93.08	
Yes	20.81	6.92	

Table 3. *Cont.*

	Depressive Disorders		
	% Yes	**% No**	***p*-Value**
Housing Insecurity			<0.0001 **
No	93.40	97.13	
Yes	6.60	2.87	
Neighborhood Safety			<0.0001 **
Safe	90.78	95.62	
Unsafe	9.22	4.38	
Food Insecurity			<0.0001 **
No	70.45	87.66	
Yes	29.55	12.34	
Inability to Afford Balanced Meals			<0.0001 **
No	66.03	86.49	
Yes	33.97	13.51	
Finances at End of Month			<0.0001 **
Excess	38.40	58.81	
Enough	42.04	35.29	
Not Enough	19.55	5.90	
30-Day Frequency of Stress			<0.0001 **
None	14.87	48.07	
Little	23.30	28.87	
Some	26.41	16.28	
More	35.42	6.78	
General Health			<0.0001 **
Excellent	7.63	20.86	
Very good/good	57.58	66.10	
Fair/Poor	34.79	13.04	
Did Not See Doctor Due to Cost			<0.0001 **
No	78.20	89.88	
Yes	21.80	10.12	
Check Up (Years)			0.0235 *
1	74.56	72.29	
2	11.54	12.57	
3–5	7.45	7.87	
5+	6.45	7.27	
Health Insurance			0.5169
No	9.89	9.55	
Yes	90.11	90.45	

* = Significant < 0.05. ** = Significant < 0.001.

4. Discussion

The present study sought to examine the relationship between those who have reported ever having been diagnosed with DD and experiences of adverse SDOH conditions in the past 12 months. In our study of 17 states participating in the Social Determinants of Health module during the 2017 administration of the BRFSS, the weighted estimate of respondents ever reporting DD was 19.9%. As DD is associated with a broader range of individual factors, including differences in socio-demographic factors such as gender, age, ethnicity, education, income level, and socio-economic status [1,5,6,8,10,11], contextual factors are also associated with mental health outcomes, such as DD [12–17]. Although most respondents reported greater proportions of financial, housing, safety, food, and balanced meal security and greater proportions of experiencing "little to no" stress, significantly different proportions of adverse SDOH experiences were observed when self-reporting ever having been diagnosed with DD.

Among survey participants, findings indicating greater proportions of respondents experiencing DD in their lifetime also reported inability to pay bills and not having enough finances at the end of the month was similar to previous studies [10,24–27,29]. Correspondingly, housing challenges were also associated with lifetime DD [33–36]. Similarly, when study participants indicated DD, they also reported greater proportions of their neighborhoods being unsafe [37–42]. Our findings also substantiated previous studies linking DD with food insecurity, including the inability to eat a balanced meal [13,43,45]. Those having experienced DD also reported more current stress, another finding supported by previous studies [19–21,23]. While the majority of survey participants reported good or better general health status, a greater proportion with a lifetime diagnosis of DD reported poor or fair health and not seeing a doctor due to cost, even when thinking medical care was necessary [1,3–8]. Conversely, no difference was observed for health insurance coverage [9], and slightly greater proportions of respondents reported a checkup in the previous year [56].

5. Implications

Several implications emerged from this present study. The findings of this study indicate that lifetime diagnoses of DD are highly prevalent among the surveyed population, with an estimated 19.9% self-reporting depression experiences. With almost 1 in 5 U.S. adults experiencing DD in their lifetime, this finding creates an urgency to increase public awareness through targeted campaigns and media outreach by public and private sectors for mental health awareness. For example, agencies such as the Substance Abuse and Mental Health Services Administration can expand the campaign "May is Mental Health Awareness Month" [57] with a focus on emphasizing different age categories during other weeks or months of the year. Furthermore, with the establishment of the new suicide and crisis lifeline, 988, public health efforts should prioritize resources that advance the understanding of the lifeline's usage for people in emotional distress in addition to suicide prevention [58].

Beyond the 988 Lifeline, government and public health entities may more "aptly lead public health and service delivery efforts that promote mental health, prevent substance misuse, and provide treatments and supports to foster recovery while ensuring equitable access and better outcomes" [59] through allocating funds and collaborating with community mental health care providers and insurers to expand access to mental health services through telehealth options, community-based clinics, and insurance coverage for mental health treatment. It is important for hospitals and clinics to provide primary care providers and other front-line health workers with additional training on the identification and management of depression. Meanwhile, mental health professionals must develop and implement culturally sensitive mental health programs and interventions to meet the needs of diverse communities [59].

Additionally, the results suggest that SDOH, such as financial instability, housing insecurity, and food insecurity, are directly related to the experience of depressive disorders. The findings underscore the importance of addressing systemic inequalities and addressing SDOH in the prevention and intervention of mental health conditions. Federal and state officials must advocate for integrating mental health into broader public health policies and initiatives. Improvement in mental health outcomes may derive from fostering community-based collaborations to address systemic inequalities and improve SDOH by developing policies and programs aimed at reducing the poverty gap and improving housing stability and food security (e.g., increasing access to nutritious food) [13]. Further, community leaders and mental health providers can promote community-based programs to improve social support and reduce stress among people who experience poor SDOH conditions [13].

The findings of this study indicate that individuals with DD experiences are more likely to report poor physical health and demonstrate a reluctance to seek medical care when necessary. This suggests the need to improve health literacy [60] and destigmatize mental illness among the public and people who experience adverse SDOH experiences [61]

to support better integration of mental and physical health care to ensure that vulnerable populations receive timely, comprehensive, and effective treatment and care. These considerations are in alignment with the U.S. Preventive Services Task Force (USPSTF) recommendation on screening for depression in adults, with a specific focus on the risk factor of "life stress" [56].

6. Limitations

The results of this study should be interpreted from the perspective of several limitations. For example, a limitation of this study includes the self-report nature of the survey, which may lead to recall bias. The telephone survey of the BRFSS excludes individuals without a telephone and those living in institutional settings. Also excluded were states who did not participate in the optional module estimating SDOH conditions. The BRFSS response rates may be less than ideal, and self-reporting certain health behaviors and outcomes may be under-reported, including types of depressive disorders [62,63]. Another limitation of the study is the inability to analyze all population racial/ethnic subgroups separately (i.e., Native American, Asian American/Pacific Islander, etc.). Finally, the cross-sectional analysis limits the ability to prove causality between the SDOH and the lifetime diagnosis of DD. Despite these limitations, our study includes several strengths, including using a large population-based sample. This allows for a descriptive estimate of lifetime diagnosis of depressive disorders within participating states of the BRFSS. The study is also among the first to investigate the SDOH factors with individual factors of health in relationship to ever having a depressive disorder employing the BRFSS Social Determinants of Health optional module among U.S. adults.

7. Conclusions

Using the data from participating states of a nationally representative survey, the 2017 administration of the BRFSS, the study investigated the relationship between the SDOH factors and self-reporting of ever having a depressive disorder among U.S. adults. The prevalence of reporting DD was observed in greater proportions among mid-life adults, women, and non-Hispanic whites. Among the individual and social determinants of health associated with a lifetime diagnosis of DD, all adverse experiences of SDOH were significantly associated. Still, health insurance coverage was not significantly different for lifetime DD self-reporting. This finding further affirms the need for interventions to build on the U.S. Preventive Services Task Force to broaden efforts to screen all adults for depression and refer adults to specific psychotherapy approaches identified through screening. Additionally, more research is needed to assess barriers to establishing adequate systems of care and how these barriers can be addressed, including addressing social determinants associated with adverse mental health outcomes.

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References

1. National Institute of Mental Health. Major Depression. 2023. Available online: https://www.nimh.nih.gov/health/statistics/major-depression#part_2563 (accessed on 15 December 2022).
2. World Health Organization. Depression. 2022. Available online: https://www.who.int/news-room/fact-sheets/detail/depression (accessed on 15 December 2022).
3. Katon, W. The impact of depression on workplace functioning and disability costs. *Am. J. Manag. Care* **2009**, *15* (Suppl. S11), S322–S327. [PubMed]
4. Lo Sasso, A.T.; Rost, K.; Beck, A. Modeling the Impact of Enhanced Depression Treatment on Workplace Functioning and Costs: A Cost-Benefit Approach. *Med. Care* **2006**, *44*, 352–358. [CrossRef] [PubMed]
5. Hasin, D.S.; Goodwin, R.D.; Stinson, F.S.; Grant, B.F. Epidemiology of major depressive disorder: Results from the National Epidemiologic Survey on Alcoholism and Related Conditions. *Arch. Gen. Psychiatry* **2005**, *62*, 1097–1106. [CrossRef] [PubMed]
6. Kessler, R.C.; Berglund, P.; Demler, O.; Jin, R.; Koretz, D.; Merikangas, K.R.; Rush, A.J.; Walters, E.E.; Wang, P.S.; National Comorbidity Survey, R. The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *JAMA* **2003**, *289*, 3095–3105. [CrossRef] [PubMed]
7. Strine, T.W.; Kroenke, K.; Dhingra, S.; Balluz, L.S.; Gonzalez, O.; Berry, J.T.; Mokdad, A.H. The associations between depression, health-related quality of life, social support, life satisfaction, and disability in community-dwelling U.S. adults. *J. Nerv. Ment. Dis.* **2009**, *197*, 61–64. [CrossRef]
8. Williams, D.R.; Gonzalez, H.M.; Neighbors, H.; Nesse, R.; Abelson, J.M.; Sweetman, J.; Jackson, J.S. Prevalence and distribution of major depressive disorder in African Americans, Caribbean blacks, and non-Hispanic whites: Results from the National Survey of American Life. *Arch. Gen. Psychiatry* **2007**, *64*, 305–315. [CrossRef]
9. Mental Health America. *The State of Mental Health In America*; MHA: Alexandria, VA, USA, 2022.
10. Mirowsky, J.; Ross, C.E. Age and the effect of economic hardship on depression. *J. Health Soc. Behav.* **2001**, *42*, 132–150. [CrossRef]
11. Riolo, S.A.; Nguyen, T.A.; Greden, J.F.; King, C.A. Prevalence of depression by race/ethnicity: Findings from the National Health and Nutrition Examination Survey III. *Am. J. Public Health* **2005**, *95*, 998–1000. [CrossRef]
12. Office of Disease Prevention and Health Promotion. Social Determinants of Health. 2022. Available online: https://health.gov/healthypeople/priority-areas/social-determinants-health (accessed on 15 December 2022).
13. Shim, R.S.; Compton, M.T. The Social Determinants of Mental Health: Psychiatrists' Roles in Addressing Discrimination and Food Insecurity. *Focus* **2020**, *18*, 25–30. [CrossRef]
14. Lepore, M.J.; Rochford, H. Addressing Food Insecurity and Malnourishment among Older Adults: The Critical Role of Older Americans Act Nutrition Programs. *Public Policy Aging Rep.* **2019**, *29*, 56–61. [CrossRef]
15. Lubell, J.; Morley, R.L.; Ashe, M.; Merola, J.; Levi, J. *Housing and Health: New Opportunities for Dialogue and Action*; ChangeLab Solutions: Oakland, CA, USA, 2012.
16. Choi, L. Financial stress and its physical effects on individuals and communities. In *Community Development Innovation Review*; Federal Reserve Bank of San Francisco: San Francisco, CA, USA, 2009; pp. 120–122.
17. Sandel, M.; Sheward, R.; Ettinger de Cuba, S.; Coleman, S.M.; Frank, D.A.; Chilton, M.; Black, M.; Heeren, T.; Pasquariello, J.; Casey, P.; et al. Unstable Housing and Caregiver and Child Health in Renter Families. *Pediatrics* **2018**, *141*, e20172199. [CrossRef] [PubMed]
18. Currie, S.R.; Fiest, K.; Guyn, L. Using Community-Level Mental Health Surveillance Data to Examine the Relationship of Depression Prevalence to Social Determinants of Health and Access to Mental Health Services. *Can. J. Community Ment. Health* **2013**, *32*, 43–57. [CrossRef]
19. Brown, G.W.; Harris, T.O.; Mechanic, D. *Life Events and Illness*; Guilford Press: New York, NY, USA, 1989.
20. Kendler, K.S.; Karkowski, L.M.; Prescott, C.A. Causal Relationship between Stressful Life Events and the Onset of Major Depression. *Am. J. Psychiatry* **1999**, *156*, 837–841. [CrossRef] [PubMed]
21. Mazure, C.M. Life stressors as risk factors in depression. *Clin. Psychol. Sci. Pract.* **1998**, *5*, 291–313. [CrossRef]
22. Shrout, P.E.; Link, B.G.; Dohrenwend, B.P.; Skodol, A.E.; Stueve, A.; Mirotznik, J. Characterizing life events as risk factors for depression: The role of fateful loss events. *J. Abnorm. Psychol.* **1989**, *98*, 460–467. [CrossRef] [PubMed]
23. Monroe, S.M.; Slavich, G.M.; Georgiades, K. *The Social Environment and Life Stress in Depression*; Handbook of Depression 2009; The Guilford Press: New York, NY, USA, 2009.
24. Lorant, V.; Deliège, D.; Eaton, W.; Robert, A.; Philippot, P.; Ansseau, M. Socioeconomic inequalities in depression: A meta-analysis. *Am. J. Epidemiol.* **2003**, *157*, 98–112. [CrossRef]
25. Sareen, J.; Afifi, T.O.; McMillan, K.A.; Asmundson, G.J. Relationship between household income and mental disorders: Findings from a population-based longitudinal study. *Arch. Gen. Psychiatry* **2011**, *68*, 419–427. [CrossRef]

26. Kiely, K.M.; Leach, L.S.; Olesen, S.C.; Butterworth, P. How financial hardship is associated with the onset of mental health problems over time. *Soc. Psychiatry Psychiatr. Epidemiol.* **2015**, *50*, 909–918. [CrossRef]
27. Heflin, C.M.; Iceland, J. Poverty, Material Hardship and Depression. *Soc. Sci. Q.* **2009**, *90*, 1051–1071. [CrossRef]
28. Lorant, V.; Croux, C.; Weich, S.; Deliège, D.; Mackenbach, J.; Ansseau, M. Depression and socio-economic risk factors: 7-year longitudinal population study. *Br. J. Psychiatry* **2007**, *190*, 293–298. [CrossRef]
29. Butterworth, P.; Rodgers, B.; Windsor, T.D. Financial hardship, socio-economic position and depression: Results from the PATH Through Life Survey. *Soc. Sci. Med.* **2009**, *69*, 229–237. [CrossRef] [PubMed]
30. Weich, S.; Lewis, G. Poverty, unemployment, and common mental disorders: Population based cohort study. *BMJ* **1998**, *317*, 115–119. [CrossRef] [PubMed]
31. Skapinakis, P. Commentary: Socioeconomic position and common mental disorders: What do we need to know? *Int. J. Epidemiol.* **2007**, *36*, 786–788. [CrossRef] [PubMed]
32. Skapinakis, P.; Weich, S.; Lewis, G.; Singleton, N.; Araya, R. Socio-economic position and common mental disorders. Longitudinal study in the general population in the UK. *Br. J. Psychiatry* **2006**, *189*, 109–117. [CrossRef] [PubMed]
33. Martin, P.; Liaw, W.; Bazemore, A.; Jetty, A.; Petterson, S.; Kushel, M. Adults with Housing Insecurity Have Worse Access to Primary and Preventive Care. *J. Am. Board. Fam. Med.* **2019**, *32*, 521–530. [CrossRef] [PubMed]
34. Jelleyman, T.; Spencer, N. Residential mobility in childhood and health outcomes: A systematic review. *J. Epidemiol. Community Health* **2008**, *62*, 584–592. [CrossRef]
35. Wright, J.D.; Rubin, B.A.; Devine, J.A. *Beside the Golden Door: Policy, Politics, and the Homeless*; Social Institutions and Social Change; Aldine de Gruyter: New York, NY, USA, 1998; 238p.
36. Wong, Y.L. Tracking change in psychological distress among homeless adults: An examination of the effect of housing status. *Health Soc. Work* **2002**, *27*, 262–273. [CrossRef]
37. Coulton, C.J.; Crampton, D.S.; Irwin, M.; Spilsbury, J.C.; Korbin, J.E. How neighborhoods influence child maltreatment: A review of the literature and alternative pathways. *Child Abuse Negl.* **2007**, *31*, 1117–1142. [CrossRef]
38. Garbarino, J.; Sherman, D. High-risk neighborhoods and high-risk families: The human ecology of child maltreatment. *Child Dev.* **1980**, *51*, 188–198. [CrossRef]
39. Klebanov, P.K.; Brooks-Gunn, J.; Duncan, G.J. Does neighborhood and family poverty affect mothers' parenting, mental health, and social support? *J. Marriage Fam.* **1994**, *56*, 441–455. [CrossRef]
40. Leventhal, T.; Brooks-Gunn, J. The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychol. Bull.* **2000**, *126*, 309–337. [CrossRef] [PubMed]
41. Lowe, S.R.; Quinn, J.W.; Richards, C.A.; Pothen, J.; Rundle, A.; Galea, S.; Ressler, K.J.; Koenen, K.C.; Bradley, B. Childhood trauma and neighborhood-level crime interact in predicting adult posttraumatic stress and major depression symptoms. *Child Abus. Negl.* **2016**, *51*, 212–222. [CrossRef] [PubMed]
42. Wilson-Genderson, M.; Pruchno, R. Effects of neighborhood violence and perceptions of neighborhood safety on depressive symptoms of older adults. *Soc. Sci. Med.* **2013**, *85*, 43–49. [CrossRef]
43. Compton, M.T.; Ku, B.S. Prevalence of Food Insecurity and Living in a Food Desert among Individuals with Serious Mental Illnesses in Public Mental Health Clinics. *Community Ment. Health J.* **2023**, *59*, 357–362. [CrossRef] [PubMed]
44. U.S. Department of Agriculture. Food Security and Nutrition Assistance. 2021. Available online: https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/food-security-and-nutrition-assistance/ (accessed on 17 January 2023).
45. Cadenas, G.A.; Cerezo, A.; Carlos Chavez, F.L.; Capielo Rosario, C.; Torres, L.; Suro, B.; Fuentes, M.; Sanchez, D. The citizenship shield: Mediated and moderated links between immigration status, discrimination, food insecurity, and negative health outcomes for latinx immigrants during the COVID-19 pandemic. *J. Community Psychol.* **2022**, 1–17. [CrossRef]
46. Downing, J.M.; Rosenthal, E. Prevalence of Social Determinants of Health Among Sexual Minority Women and Men in 2017. *Am. J. Prev. Med.* **2020**, *59*, 118–122. [CrossRef]
47. Cole, M.B.; Nguyen, K.H. Unmet social needs among low-income adults in the United States: Associations with health care access and quality. *Health Serv. Res.* **2020**, *55* (Suppl. 2), 873–882. [CrossRef]
48. Coughlin, S.S.; Datta, B.; Berman, A.; Hatzigeorgiou, C. A cross-sectional study of financial distress in persons with multimorbidity. *Prev. Med. Rep.* **2021**, *23*, 101464. [CrossRef]
49. Carlson, S.A.; Wheaton, A.G.; Liu, Y.; Moore, L.V.; Eke, P.I.; Croft, J.B.; Greenlund, K.J.; Thomas, C.W. Associations of self-reported chronic obstructive pulmonary disease with indicators of economic instability and stress—16 states, 2017. *Chronic Illn.* **2021**, *19*, 327–338. [CrossRef]
50. Lund, J.J.; Chen, T.T.; LaBazzo, G.E.; Hawes, S.E.; Mooney, S.J. The association between three key social determinants of health and life dissatisfaction: A 2017 behavioral risk factor surveillance system analysis. *Prev. Med.* **2021**, *153*, 106724. [CrossRef]
51. Centers for Disease Control and Prevention. *LLCP 2017 Codebook Report: Behavioral Risk Factor Surveillance System*; D.o.P.H. National Center for Chronic Disease Prevention and Health Promotion, Ed.; U.S. Department of Health & Human Services: Atlanta, GA, USA, 2018.
52. Centers for Disease Control and Prevention. *The Behavioral Risk Factor Surveillance System 2017 Summary Data Quality Report*; D.o.P.H. National Center for Chronic Disease Prevention and Health Promotion, Ed.; U.S. Department of Health & Human Services: Atlanta, GA, USA, 2018.

53. Braveman, P.; Gottlieb, L. The social determinants of health: It's time to consider the causes of the causes. *Public Health Rep.* **2014**, *129* (Suppl. S2), 19–31. [CrossRef] [PubMed]
54. Alderwick, H.; Gottlieb, L.M. Meanings and Misunderstandings: A Social Determinants of Health Lexicon for Health Care Systems. *Milbank Q.* **2019**, *97*, 407–419. [CrossRef] [PubMed]
55. SAS Institute Inc. *SAS 9.4*; SAS Institute: Cary, NC, USA, 2020.
56. Siu, A.L.; Bibbins-Domingo, K.; Grossman, D.C.; Baumann, L.C.; Davidson, K.W.; Ebell, M.; García, F.A.; Gillman, M.; Herzstein, J.; Kemper, A.R.; et al. Screening for Depression in Adults: U.S. Preventive Services Task Force Recommendation Statement. *JAMA* **2016**, *315*, 380–387. [CrossRef]
57. Substance Abuse and Mental Health Services Administration. May Is Mental Health Awareness Month. 2022. Available online: https://www.samhsa.gov/programs/mental-health-awareness-month (accessed on 15 January 2023).
58. Substance Abuse and Mental Health Services Administration. THE 988 SUICIDE & CRISIS LIFELINE. 2022. Available online: https://988lifeline.org/ (accessed on 15 January 2023).
59. Substance Abuse and Mental Health Services Administration. *Substance Abuse and Mental Health Services Administration Interim Strategic Plan*; U.S. Department of Health & Human Services: Rockville, MD, USA, 2022.
60. Lincoln, A.; Paasche-Orlow, M.K.; Cheng, D.M.; Lloyd-Travaglini, C.; Caruso, C.; Saitz, R.; Samet, J.H. Impact of health literacy on depressive symptoms and mental health-related: Quality of life among adults with addiction. *J. Gen. Intern. Med.* **2006**, *21*, 818–822. [CrossRef] [PubMed]
61. Hatzenbuehler, M.L.; Phelan, J.C.; Link, B.G. Stigma as a fundamental cause of population health inequalities. *Am. J. Public. Health* **2013**, *103*, 813–821. [CrossRef] [PubMed]
62. Nelson, D.E.; Naimi, T.S.; Brewer, R.D.; Roeber, J.U.S. state alcohol sales compared to survey data, 1993–2006. *Addiction* **2010**, *105*, 1589–1596. [CrossRef] [PubMed]
63. Hunt, M.; Auriemma, J.; Cashaw, A.C. Self-report bias and underreporting of depression on the BDI-II. *J. Personal. Assess.* **2003**, *80*, 26–30. [CrossRef]