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Understanding Sexual Assault and Psychological Distress in the Context of Material Hardship

by

Gabriela R. Perez

A thesis

submitted in partial fulfillment

of the requirements for the degree of

Master of Science in the Department of Psychology

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To the Graduate Faculty:

The members of the committee appointed to examine the thesis of Gabriela Perez find it satisfactory and recommend that it be accepted.

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Human Subjects Committee Approval Letter

March 11, 2022

Gabriela Perez
Psychology
MS 8112

RE: Study Number IRB-FY2022-157: Understanding Sexual Assault and Psychological Distress in the Context of Material Hardship

Dear Ms. Perez:

Thank you for your responses to a previous review of the study listed above. These responses are eligible for expedited review under OHRP (DHHS) and FDA guidelines. This is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

You may conduct your study as described in your application effective immediately. This study is not subject to renewal under current OHRP (DHHS) guidelines.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179; email humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

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Abstract

Sexual assaults against women are prevalent, and have been associated with a range of negative mental health outcomes. However, mental health is also affected by contextual factors, including material hardship (i.e., food insecurity, housing insecurity, and financial barriers to medical care). Thus, the present study investigated the extent to which sexual assault and material hardship interact and are associated with depression, substance use problems, PTSD, and flourishing. Data was collected from 428 women on Amazon's Mechanical Turk (MTurk). The majority (78.8%) of women reported an experience of sexual assault in adulthood. Sexual assault and material hardship were both independently associated with psychological distress, but material hardship did not moderate the relation between sexual assault and psychological distress. The high rate of sexual assault seen in this sample demonstrates the necessity of understanding relevant psychological distress symptoms in populations experiencing material hardship, as it informs strategies for therapeutic intervention.

Key Words: sexual assault, material hardship, mental health, psychopathology, violence against women

Introduction

Sexual Assault against Women

Sexual assaults against women are prevalent, with the National Intimate Partner and Sexual Violence Survey indicating that 43.6% of women in the US have experienced unwanted sexual contact in their lifetimes (Smith et al., 2018). A multi-faceted construct, sexual assault encompasses attempted and completed rape, incapacitated sexual contact, sexual coercion, and other unwanted sexual contact (Koss et al., 2007; Smith et al., 2018). In a 2005 study of 110,000 women across 25 US states and territories, 3.5% of participants reported sexual assault in the form of unwanted sexual situations or touch, attempted nonconsensual sex, or completed nonconsensual sex in the 12 months prior to the survey (Black et al., 2014). Further, a study of 472 women found that 22% of women had been sexually assaulted in adulthood, with assaults occurring between ages 18 and 55 (Elliott et al., 2004). Nationally, from 2017 to 2018, the rate of sexual assault almost doubled, increasing from 1.4 victimizations per 1,000 to 2.7 per 1,000 in men and women aged 12 or older (Morgan & Oudekerk, 2019).

Negative outcomes associated with sexual assault include psychological distress and disorders such as depression, substance use disorders, or PTSD (Chen et al., 2010; Dworkin et al., 2017). However, not all individuals who experience sexual assault develop psychological disorders. Scholars have identified several risk factors associated with sexual assault, including living in poverty and having fewer resources (Breiding et al., 2017; Briere & Jordan, 2004; Loya, 2014). Thus, the proposed study investigated the effects of sexual assault on women's mental health and wellbeing in the broader context of women's experiences of material hardship or access to basic goods and services, including food, housing, and medical care.

Sexual Assault and Mental Health Outcomes

The current literature provides evidence for a broad range of negative mental health outcomes associated with sexual assault, from the development of general distress to specific forms of psychopathology (Artime et al., 2019; Dworkin, 2018; Krupnick et al., 2004). For example, a meta-analysis indicated that both men and women who have been sexually assaulted experience psychopathology with a higher frequency and severity than their non-assaulted counterparts, with depression, substance use disorders, and trauma-related disorders among the most commonly reported outcomes (Dworkin et al., 2017). In addition, a recent study on child and adult sexual assault survivors in Turkey found that half of survivors in their sample met criteria for at least one psychiatric disorder (Oruc et al., 2021).

Depression. Depressive disorders are characterized by changes in mood (i.e., sadness, irritability), cognitions (i.e., inability to concentrate), and somatizations (i.e., sleep, appetite) that are functionally impairing (American Psychiatric Association, 2013). Depressive symptoms and disorders emerge in many sexual assault survivors (Campbell et al., 2009; Dworkin et al., 2017; Krupnick et al., 2004). For example, a meta-analysis on lifetime sexual assault demonstrated that the odds of dysthymia, major depressive episodes, and major depressive disorder were significantly higher in sexually assaulted participants compared to non-assaulted participants (Dworkin, 2018). Another meta-analysis of longitudinal studies identified a significant association between a history of sexual assault and a lifetime depression diagnosis, with sexually assaulted participants demonstrating 2.66 higher odds of depression than participants with no sexual assault history (Chen et al., 2010). Additionally, authors of a study of over 3,000 adults reported that, after a sexual assault, participants were 2.4 times more likely to meet diagnostic criteria for a major depressive episode (Burnam et al., 1988).

The potential for development of depression after a sexual assault is particularly well established in college samples. For example, in a study of nearly 7,000 college women across Canada, sexual assault victims were 2.11 times more likely to be at risk of depression than those who were not victimized (McDougall et al., 2019). In a national sample of 2,000 college women, women who were forcibly raped were 3.55 times more likely to meet criteria for a major depressive episode (Zinzow et al., 2010). Further, a longitudinal study in German college students demonstrated that sexual assault predicted depression in women (Krahé & Berger, 2017). Lastly, a study of 483 college students found that women who were sexually assaulted were 2.45 times more likely to have clinically relevant symptoms of depression, compared to their non-assaulted counterparts (Carey et al., 2018).

Substance Use. Sexual assault also confers risk for substance abuse (Dworkin, 2018; Moustafa et al., 2021; Rhew et al., 2017). For example, in a recent meta-analysis, Dworkin (2018) reported that sexual assault survivors had significantly higher odds of a drug use or alcohol use disorder when compared to non-assaulted participants, with higher odds of a drug use disorder than an alcohol use disorder. Further, in a sample of over 3,000 men and women, survivors of sexual assault were 2.3 times more likely to develop clinically significant alcohol abuse/dependence and 2.5 times more likely to have clinically significant drug abuse/dependence, when compared to non-assaulted participants (Burnam et al., 1988).

Sexual assault at any point in the lifetime is associated with higher odds of illicit drug use (Kaukinen & DeMaris, 2005). In a sample of 1,863 women who had experienced adult sexual assault, using substances to cope mediated the relation between PTSD and problem drug use (Ullman et al., 2013). Further, Ullman and colleagues (2006) conducted a study on women with histories of sexual assault and current PTSD. In their sample of over 500 women, they found that

25.7% had used cocaine, heroin, or psychedelic drugs in the past year, and that 44.8% had a past year drinking problem.

Next, in a sample of 8,533 African American participants, a history of sexual assault was associated with increased substance use and higher odds of problematic substance use (Rothbaum, 2017). There is some research to suggest the association between sexual assault and substance use is stronger for racial minority women. In their analysis of a national sample of 7,689 women, Kaukinen & DeMaris (2005) found that adult sexual assault was more strongly associated with illicit drug use in racial minority women than White women.

Finally, there are a number of studies with college women indicating a relation between sexual violence and alcohol use. In a longitudinal study, Lindgren et al. (2012) demonstrated a direct, positive relation between experiences of sexual assault and problem drinking behaviors six months after the assault. Next, compared to women who had not been assaulted, sexual assault survivors demonstrated significantly more hazardous drinking behaviors in a study of college women (Littleton et al., 2012). Lastly, Stappenback and colleagues (2015) found a significant effect of sexual assault distress on drinking behaviors, such that the higher a woman's sexual assault distress level on a given day, the more alcohol she drank that day.

Self-Medication. One potential explanation for the high risk of substance abuse after any type of traumatic event, including a sexual assault, is the self-medication hypothesis. This theory posits that some individuals use substances to relieve or change their affective states, especially those which are painful, unbearable, or even confusing (Khantzian, 1997). Given the wide array of affective outcomes that are associated with sexual assault, including depression, some individuals may attempt to cope with these affects through substance use (Lo et al., 2015; Turner et al., 2018), especially individuals who have difficulty self-regulating (Khantzian, 1997). For

example, a recent study of 1,896 college students found support for the self-medication model, such that drinking to cope with trauma-related symptoms was associated with alcohol use problems after a wide range of traumatic experiences (Hawn et al., 2021). Specific to sexual assault, a study of 318 college women found that women who had been sexually assaulted used alcohol to self-medicate, such that 52% of the variance in alcohol use was attributed to sexual assault and psychological distress through the negative reinforcement of alcohol use (i.e., reducing anxiety; Miranda Jr., et al., 2002).

Social, cultural, or other contextual factors may also play a role in alcohol use, as a recent longitudinal study found that young adults had increased alcohol use problems during months they lived in neighborhoods with higher poverty levels than their average (Rhew et al., 2020). In a sample of African American older adults, financial difficulties were significantly associated with alcohol use, as well (Assari et al., 2019). Another study of women sexual assault survivors demonstrated that women with PTSD and polysubstance use had lower socioeconomic statuses than women with PTSD only (Ullman et al., 2006). Thus, other contextual factors such as SES or access to resources may be related to substance use as a coping mechanism.

Posttraumatic Stress Disorder (PTSD). PTSD is characterized by intrusions, avoidance, and alterations in cognition, mood, and arousal in response to exposure to actual or threatened death, serious injury, or sexual violence (American Psychiatric Association, 2013). Consequently, there is a robust association between PTSD and sexual assault. For example, a meta-analysis of longitudinal studies demonstrated a significant relation between sexual assault and a lifetime diagnosis of PTSD (Chen et al., 2010). Another meta-analysis found that sexual assault was associated with greater risk for PTSD than other psychological disorders (Dworkin et al., 2017). In addition, Dworkin (2018) conducted a meta-analysis that demonstrated rates of

PTSD were higher in sexual assault survivors than survivors of other types of trauma. Specific to women, a review on adult sexual assault in women indicated lifetime rates of PTSD between 17 and 65% in this population (Campbell et al., 2009).

Wellbeing and Flourishing. Wellbeing is a subjective assessment of all facets of an individual's life, that includes positive aspects and lack of negative aspects (Diener, 1984). As such, trauma, including sexual assault, can have varying effects on wellbeing. First, wellbeing can be negatively affected by sexual assault, as demonstrated by Wadsworth's (2015) qualitative study with 22 women who were adult sexual assault survivors. After a sexual assault, many women reported its negative impact on their overall wellbeing including physical, mental, relational, career/educational/financial, and spiritual health domains (Wadsworth, 2015). Kashdan and colleagues (2020) investigated wellbeing after a sexual assault using daily diary data and found mixed results. While, on average, there was a rapid decline in wellbeing in the days following a sexual assault, there was no consistent pattern across the participants. Declines, no change, and slight increases in wellbeing were seen across the seven individuals who had been sexually assaulted. The authors provide potential explanations for this, such as ability to cope short-term using avoidance or suppression, posttraumatic growth, and an individual's pattern of wellbeing before the assault (Kashdan et al., 2020). It is also important to note that the small number of survivors in these studies limit the generalizability of these findings.

Flourishing, a specific facet of psychological wellbeing, is explained by Huppert (2009) as, "the combination of feeling good and functioning effectively" (p. 137). The literature is also mixed regarding the association between traumatic experiences and flourishing. Consistent with general wellbeing, flourishing can be negatively affected by traumatic experiences. For example, a recent study of over 500 women found a significant negative relation between experiences of

sexual assault and flourishing (Schindler, 2021). However, similar to overall wellbeing, traumatic experiences can also lead to higher levels of flourishing, potentially through the process of traumatic growth. For example, in a college sample, some women who experienced adulthood sexual assault experienced growth and positive change after the assault (Borja et al., 2006).

Sexual Assault and Comorbid, Long Lasting Mental Health Outcomes. Researchers have evaluated some of the mental health outcomes of sexual assault concurrently as well. For example, Ullman and Brecklin (2003) investigated health outcomes in a national sample of over 600 women. These authors reported prevalence rates of psychological disorders (DSM-III-R) in women with histories of sexual assault: 66% of women qualified for lifetime major depressive syndrome, 33% had symptoms of alcohol dependence, and 41% reached diagnostic threshold for PTSD. These mental health outcomes were also significantly correlated with one another (Ullmann & Brecklin, 2003), suggesting the importance of assessing mental health broadly in the survivors of sexual assault.

Moreover, existing research suggests that the psychological outcomes of sexual assaults may last for years. For example, Rothbaum (2017) found that 97.2% of the sexual assaults reported by their sample (N = 9,807) occurred before age 30. However, the mean age of participants in this sample was 40 years old and negative psychological outcomes were still observed, including depression, PTSD, drug abuse, and lower wellbeing. Further, Elliott and colleagues' (2004) study was conducted an average of 14 years after their participants' most recent assault, yet still found that women with sexual assault histories reported significantly higher distress than non-assaulted women on all clinical measures, including symptoms of depression and PTSD.

In a sample of over 4,000 women followed over time, sexual assault was a risk factor for a major depressive episode two years later, such that women with a history of sexual assault were twice as likely to have a major depressive episode than women with no history of sexual assault (Hedtke et al., 2008). Experiences of sexual assault were also significantly associated with past-year substance use, consisting of alcohol abuse and nonexperimental drug abuse, in addition to substance use problems two years later. Additionally, sexual assault was a significant risk factor for PTSD two years later, such that women who had been sexually assaulted were three times more likely to have PTSD than women who had not been assaulted (Hedtke et al., 2008). Thus, negative mental health symptoms appear to continue to be present long after a woman is sexually assaulted.

Relatively few studies have examined the associations among sexual assault, depression, substance use, PTSD, and wellbeing concurrently. The effects of sexual assault vary widely, and can be influenced by individual, trauma-related, historic, and sociocultural factors (Briere & Jordan, 2004). Therefore, it is imperative to examine additional contextual factors that may impact the mental health outcomes of a sexual assault.

Socioeconomic Status and Sexual Assault

Research has demonstrated a reciprocal relation between socioeconomic status (SES) and sexual victimization across the lifespan (Lee et al., 2017; Loya, 2014). First, in a nationally representative study from 2014, Black and colleagues found a significant difference in risk for sexual assault by income, such that women with household incomes below $25,000 had a risk of sexual assault over two times greater than women with incomes over $50,000. Further, a longitudinal study conducted by Byrne and colleagues (1999) indicated a bidirectional association between SES and interpersonal violence. Initially, women with incomes below

poverty level were at greater risk for sexual and physical assault. Subsequently, two years after victimization, women were more likely to be unemployed or to fall below the poverty line if they were not living in poverty before the assault. Thus, sexual assault appears to occur at higher rates among women living at lower SES and women appear to be more at risk of reduced SES subsequent to a sexual assault.

Specific financial consequences of sexual victimization have been identified regarding the impact on women's employment post assault, such as lost wages from time off of work after the assault, decreased performance, or job loss (Loya, 2014). A longitudinal study conducted by Monnier et al. (2002) found that women who had been raped were more likely to experience a decrease in resources, including the loss of a job or reduced income, three months after their assault. The loss of productivity that can occur after an assault is the second largest cost of sexual assault after mental health care, and accounts for 43% of direct, tangible expenses from sexual assault (Post et al., 2002). These sequalae can continue long after an assault, as a recent qualitative study demonstrated that sexual assault experienced in college was related to career issues later in life, such as lower performance or lack of confidence to advance in their careers (Potter et al., 2018).

Tangible losses after sexual assault can be deleterious, but when intangible losses are also considered, the burden becomes greater. Miller and colleagues (1996) estimated that rape and attempted rape cost $5,100 in tangible expenses (i.e., medical care, mental health services) per individual. Based on average jury awards for pain and suffering, when the intangible cost was added, each rape and attempted rape was estimated to cost $87,000 on average, or $162,087 in 2022 US dollars after adjusting for inflation (Loya, 2014; Miller et al., 1996; U.S. Bureau of Labor Statistics, n.d.). However, when the cost is considered over the lifespan, the total

population economic burden was estimated in 2014 to be nearly $3.1 trillion, or over $3.8 trillion in 2022 US dollars, which included medical costs, lost work productivity, criminal justice system costs, and related health costs in US adults (Peterson et al., 2017; U.S. Bureau of Labor Statistics, n.d.). These costs were referred to by Post and colleagues (2002) as the "rape tax." In sum, research suggests that women with lower SES may be at increased risk of sexual assault as well as a high cost associated with recovery efforts from sexual assault.

Material Hardship

More recently, researchers have advocated for using specific indicators of SES beyond the typical dimensions of income and education to examine a broader range of economic disadvantage (Fedina et al., 2020). Measuring poverty as a multidimensional construct allows for greater specificity (Gershoff et al., 2007), which has both empirical and clinical consequences. Material hardship is an often overlooked facet of poverty that involves inadequate access to basic goods and services, including food, housing, and medical care (Beverly, 2001; Mayer & Jencks, 1989). Indeed, previous research demonstrates a distinction between income poverty and material hardship as constructs for assessing need (Beverly, 2001; Nelson, 2011). For example, in a study of 373 families living in New York City, 28% were experiencing income poverty, but 39% were experiencing material hardship (Neckerman et al., 2016). Additionally, Short (2005) found a low correlation (r = .178) between income and measures of material hardship, demonstrating the two constructs are different.

Measuring poverty more broadly provides a different perspective on not only who is in need, but also which needs are most prevalent. For example, a recent national study of over 7,500 adults oversampled low income participants and found 39.4% of their sample reported experiencing at least one type of material hardship (i.e., difficulty meeting basic needs for food,

housing, utilities, or medical care) in the past year (Karpman et al., 2018). Most common was food insecurity (23.3%), followed by access to medical care (17.8%). Additionally, adults who experienced any type of material hardship were more likely to experience multiple types. Of the adults who reported at least one type of hardship, 60.2% reported at least two and 34.7% reported three or more hardships (Karpman et al., 2018). Lastly, this study found that certain populations may be at higher risk for experiencing material hardship, including women, participants with less education, and Black and Hispanic individuals.

Material Hardship and Traumatic Experiences

There is some literature to suggest material hardship is related to traumatic experiences. A study on food insecurity specifically found that individuals with higher levels of food insecurity had significantly more prior trauma exposure (Becker et al., 2018). Additionally, in women with children, adverse childhood experiences (ACES) have been associated with food insecurity in adulthood (Chilton et al., 2015). Regarding housing insecurity, authors conducting a longitudinal study with Australians using public assistance found that women who were housing insecure were nearly three times more likely to report being sexually assaulted in the previous six months than women who had secure housing (Diette & Ribar, 2018). Trauma exposure may also be associated with a decreased access to medical care. Kapur and Windish (2011) found that lifetime sexual assault victims were less likely to see a physician for a routine check-up in the year prior to the interview. In addition, sexual assault survivors in this study were also less likely to utilize any type of health care in the year prior to the interview due to cost. Wagner and colleagues (2012) investigated trauma exposure and access to medical care in refugee populations in the US. Their study demonstrated that severity of trauma symptoms was associated with greater barriers to health care, such as cost and access difficulties (Wagner et al.,

2012). Thus, experiences of material hardship and trauma appear to be correlated; however, the directionality of this association is not clear and research has not been conducted to examine trauma and multiple facets of material hardship concurrently.

Material Hardship and Mental Health Outcomes

Poor mental health outcomes are associated with poverty (Ribeiro et al., 2017), but the role of material hardship as a risk factor for mental health problems is not as clear. A study by McCarthy and colleagues (2018) demonstrated that there is a differential impact of material hardship on mental health, beyond income poverty. Specifically, they found that material hardship had a significant effect on overall mental health and depression, while having a household income below the poverty line based on household size did not (McCarthy et al., 2018). Further, the results of some studies suggest that material hardship mediates the relation between poverty and mental health (Heflin & Iceland, 2009; Katz et al., 2018; McCarthy et al., 2018).

Depression. Material hardship has been positively associated with depressive symptoms in several populations. A nationally representative sample of over 13,000 adults aged 24-34 was utilized to investigate the relation between health outcomes and material hardship, composed of food hardship, difficulty paying utility, phone, or rent/mortgage bills, and lack of health insurance or medical care (Huang et al., 2021). This study found that young adults experiencing any material hardship had significantly higher odds of depression than participants without material hardship, including increasing odds of depression for each additional type of hardship (Huang et al., 2021). In a study of 3,541 mothers across 15 states, unstable housing, receiving free food, and lack of medical care due to cost were all significantly positively associated with an increased risk of depression (Heflin & Iceland, 2009). Further, Katz and colleagues (2018)

demonstrated a positive relation between depression and material hardship, which measured need surrounding food, access to medical care, clothing, housing, and phone access, in 892 low-income pregnant women. This study also found that women who identified as racial/ethnic minorities were significantly more likely to experience material hardship than White women (Katz et al., 2018). Additionally, depressive symptoms and material hardship were significantly associated in a rural African American sample (N = 250), where material hardship included the ability to pay for basic expenses, rent/mortgage, and utilities, in addition to phone access and affording leisure activities (Weaver et al., 2018). Lastly, depression and food insecurity were positively associated in a sample of 345 older adults, such that participants experiencing food insecurity were almost five times more likely to have depressive symptoms than food secure participants (Johnson et al., 2011). However, this study found no significant relationship between depression and other aspects of material hardship, including inadequate housing or lack of medical care (Johnson et al., 2011). Overall, a number of studies have identified a positive association between depression and multiple components of material hardship across varied samples of individuals.

Substance Use. Prior research has identified associations between poverty and substance use, and researchers suggest that one possible explanation for this association is the use of substances to cope with financial strain (Smyth & Kost, 1998). For example, Hatch (2007) found that women who experienced economic stressors (i.e., had uncertainties related to obtaining food on a daily basis, ran out of money for housing) had an increased likelihood of using drugs. Additionally, a study of over 1,400 adults found that the relation between financial strain and drinking to cope was mediated by depression (Peirce et al., 1994).

Next, a study including a nationally representative sample of 14,786 young adults found that food insecurity was associated with significantly higher odds of using drugs (Nagata et al., 2020). The odds of using drugs, including methamphetamine, marijuana, cocaine, opioids, sedatives, tranquilizers, and other stimulants, for food insecure women was 1.6 to 2.1 times larger than the odds of drug use by food secure women. Further, a longitudinal study of over 2,500 women also compared women with high and low food security, and found that women with low food security had 1.6 times higher odds of illicit drug use and women with very low food security had 2.5 times higher odds of illicit drug use (Whittle et al., 2018).

While researchers have identified an increased risk of substance use in homeless populations (Fazel et al., 2008), there is less literature focused on populations with unstable housing. In a Canadian sample of over 1,400 women with HIV, current injection drug users had 3.28 higher odds of experiencing concurrent food and housing insecurity compared to respondents that have never injected drugs (Logie et al., 2018). Additionally, a longitudinal study in Australia found that marijuana use increased women's risk of housing insecurity (Diette & Ribar, 2018).

Lastly, unmet need for mental health care was associated with increased use of illicit drugs in a study of 18,849 adults (Harris & Edlund, 2005). This study provided support for the self-medication model, taking into account a lack of access to health care. However, unmet need for mental health care was not significantly associated with heavy alcohol use in the sample (Harris & Edlund, 2005). In sum, there is evidence linking multiple aspects of material hardship to substance use.

PTSD. There is an established relation between low SES and risk for developing PTSD after a traumatic event (Tang et al., 2017; Visser et al., 2017), even specifically for women

(Coker et al., 2005), and there is some literature focused on PTSD and material hardship. For example, a recent study with low-income Black women demonstrated a significant association between material hardship and PTSD symptoms (S. Holmes et al., 2021b). Further, a longitudinal study of 10,685 participants examined the temporal association between material hardship and PTSD (S. Holmes et al., 2021a). Their results demonstrated a reciprocal relationship, such that prior PTSD diagnoses were associated with increased odds of material hardship and previous material hardship was associated with increased odds of PTSD. Notably, these results also indicated that women were at higher risk for material hardship than men, and Black participants were at higher risk than participants of other races/ethnicities (S. Holmes et al., 2021a).

Individual aspects of material hardship have also been studied in relation to PTSD. Whittle and colleagues (2019) conducted a study on food insecurity and mental health in 2,553 women. Their results indicated a positive relation between food insecurity and PTSD, such that higher levels of food insecurity were associated with more symptoms of PTSD and greater risk of meeting diagnostic criteria for PTSD. Lastly, Lehavot and colleagues (2013) investigated barriers to healthcare in women veterans. They found that 59% of women presenting with both a PTSD diagnosis and depressive symptoms reported unmet medical needs in the past year. These women were more likely to attribute that unmet need to affordability than women with either PTSD or depressive symptoms (Lehavot et al., 2013).

Flourishing. While there is a dearth of research on material hardship and flourishing, there is some literature on the impact of income on flourishing and wellbeing. A study in 23 European countries with 43,000 participants found that income was positively associated with flourishing (Huppert & So, 2009). Further, another study with college students demonstrated a

significant difference in flourishing based on perceived family income (i.e., serious economic difficulty, family lives comfortably financially), such that women with higher perceived incomes showed higher levels of flourishing and women with lower perceived incomes had lower flourishing levels (de la Fuente et al., 2020). However, this analysis demonstrated a negligible effect size. In addition, a New Zealand study investigating a broader range of wellbeing in a random sample of almost 2,000 participants found a positive relationship between income and overall wellbeing (Waldegrave & Cameron, 2010). Overall, research indicates that higher income is associated with better wellbeing, but there is a dearth of information on the association between wellbeing and lower incomes, poverty, and material hardship.

Sexual Assault, Material Hardship, and Mental Health Outcomes

To date, there is no research that examines the concurrent impact of both sexual assault and material hardship on mental health outcomes. Fedina and colleagues (2020) recently conducted analyses using a subset of data from the 2010 U.S. National Intimate Partner and Sexual Violence Survey (NISVS) with 3,215 women reporting at least one lifetime experience of sexual assault. Women's material hardship was assessed and defined as food insecurity, housing insecurity, or financial barriers to health care. The researchers found that women with a history of sexual assault who were experiencing material hardship reported worse overall mental health statuses (Fedina et al., 2020). However, this study did not investigate specific mental health problems or disorders. Additionally, using income as opposed to material hardship, Bryant-Davis and colleagues (2010) investigated poverty and mental health outcomes in over 400 African American adult sexual assault survivors. Their results indicated that lower income was positively associated with depressive symptoms, PTSD symptoms, and illicit drug use when controlling for childhood sexual assault (Bryant-Davis et al., 2010). Gilroy and colleagues (2016) examined

housing insecurity in women, and demonstrated that women with unstable housing had significantly higher levels of PTSD, depression, and sexual abuse than women with secure housing.

Using a longitudinal design, Heflin and Butler (2012) studied women's mental health, experiences of partner violence, and material hardship, and found that different mental health problems were associated with aspects of material hardship. For example, women who entered into food insecurity were more likely to have PTSD than women who remained food secure. Further, women were more likely to have their utilities disconnected if they were depressed or after periods of heavy drug use, while alcohol dependence was more likely to precede unmet medical needs. Women were also at higher risk of entering into food insecurity or having unmet medical needs if they experienced partner violence, but were actually at lower risk of having their utilities disconnected after partner violence (Heflin & Butler, 2012). Authors of a qualitative study examining exposure to violence in women experiencing food insecurity noted that many of the women linked their sexual assault with their low financial status, difficulty obtaining jobs with higher salaries, and inability to afford food (Chilton et al., 2013). In sum, there are a few studies that support further exploration of how sexual assault and material hardship may interact to predict mental health distress.

Theoretical Framework

Both material hardship and sexual assault of women can be conceptualized within the theoretical framework of structural violence. From a structural violence perspective, social structures or systems facilitate injustice and inequality that lead to, allow for, and normalize violence (Rylko-Bauer & Farmer, 2016). This type of framework for violence also considers macro-level aspects of violence, including the power dynamics that maintain inequalities

(Leatherman & Goodman, 2011; Rylko-Bauer & Farmer, 2016). For example, in societies that have more egalitarian views on men and women, women are at lower risk of sexual violence (Smuts, 1996; Yodanis, 2004). Further, Yodanis (2004) conducted a multi-country study on sexual violence against women and found that the status of women in a country was associated with the prevalence of sexual violence against women in that country, such that countries with higher educational and occupational status of women had lower rates of sexual violence toward women. A structural violence framework shifts attention to the social structures (i.e., institutions or policies) that sustain an unequal distribution of harm and risk, which can include both sexual violence and experiences of material hardship (Leatherman & Goodman, 2011; Rylko-Bauer & Farmer, 2016). Further, structural violence increases the vulnerability to the negative effects of these inequalities (Leatherman & Goodman, 2011).

Within this framework, the social structural factors relevant to violence against women and material hardship are crucial to address. Specifically, there is evidence that both one's gender and access to resources influences the likelihood of experiencing violence. For example, Smuts (1996) found that husbands physically assaulting their wives followed a pattern based on the wife's economic dependence in industrialized countries. Physical violence toward women was more common in relationships where the wife was very dependent or minimally dependent on her husband economically; however, it was less common when economic dependence was intermediate (Smuts, 1996). In addition, Browne and colleagues (1999) conducted a longitudinal study that predicted women's ability to work as it related to partner violence. Results indicated that women who experienced recent partner violence were about one fifth as likely to work full time for six months as women who did not experience partner violence. This inability to work can be especially detrimental to women in poverty. Similarly, a study with women who

experienced partner violence suggested that their partners interfered with their education and work (Raphael & Tolman, 1997). Specifically, women with violent partners were three times more likely to have their partner prevent their participation in education and work training, while another found that women with violent partners were 15 times more likely to have a partner that did not like them going to school or work, compared to non-abused women. Results of these studies demonstrate that there are additive effects of violence in addition to poverty for women's mental health (Raphael & Tolman, 1997), and demonstrate the necessity of investigating the structural context of violence.

Finally, it is important to note the focus on the distribution of power in theories of structural violence is similar to feminist theories of violence against women, especially intersectional feminist theory. Feminist views on violence against women aim to recognize the role of gender in violence against women (Renzetti, 1993), while also recognizing that other social contexts, including economic, cultural, and social factors, influence the extent and forms of violence perpetrated against women (Dutton & Goodman, 2005). Further, feminist theorists emphasize the relation between gender and power, arguing that structural masculine power and privilege encourage and reproduce violence against women (Brubaker, 2021; Jasinski, 2001). An intersectional feminist approach considers these concepts in light of their intersection with injustice, oppression, and adversity (Ciurria, 2020). In this way, the social implications of each identity of an individual is considered (Canan & Levand, 2019). For example, specific to sexual assault, having layered marginalized identities (e.g., women of color) puts individuals at an increased risk for sexual assault (Canan & Levand, 2019). Thus, it is important to assess many aspects of women's identities and social context, including women's access to resources, and

examine to what extent this access is associated with their mental health, in addition to whether SES increases women's risk of negative outcomes after experiencing sexual violence.

Present Study

To summarize, while scholars have investigated these constructs separately, there is no current research assessing sexual assault and multiple aspects of material hardship. Further, though research has identified associations between these variables and mental health, no one has examined the extent to which material hardship may interact with experiences of sexual assault to affect mental health. Therefore, the purpose of the present study was to investigate how sexual assault and material hardship, as independent predictors as well as the interaction between these two factors, were associated with current mental health outcomes, including depression, substance use problems, PTSD, and wellbeing, in women. The present study extends the current literature by assessing multiple aspects of material hardship and psychological distress and simultaneously examining the associations among these variables in one model.

Hypotheses

1. Food insecurity, housing insecurity, and medical care hardship will load onto the latent variable of material hardship.
2. Depressive symptoms, alcohol use problems, drug use problems, and PTSD symptoms will load onto the latent variable of psychological distress.
3. Prior sexual assault will be significantly associated with higher rates of current psychological distress and lower levels of flourishing.
4. Experiences of material hardship will be significantly associated with higher rates of current psychological distress and lower levels of flourishing.

5. Sexual assault and material hardship will interact and have a significant association with higher rates of psychological distress, in addition to lower levels of flourishing.

Methods

Participants

The present study included 424 women recruited through Amazon's Mechanical Turk (MTurk). MTurk workers were eligible to participate if they identified as a woman and were 18 years or older. For the purposes of the present study, the sample was restricted to the US (Chandler & Shapiro, 2016). Further, only workers with a 95% or higher approval rate on MTurk were eligible to participate, as research indicates these workers score better on attention checks than workers with an approval rate less than 95% (Peer et al., 2014).

Participant ages ranged from 19 to 90 years old (M = 38.87, SD = 13.22). Most women identified as White/ European-American (82%), while 6.8% identified as Black/African-American, 4.9% identified as Asian-American/Asian, 3.0% identified as biracial, and 2.1% identified as Hispanic/Latina/Latinx. Two women identified as transgender. In terms of sexual orientation, 77.3% of women identified as heterosexual, 17.8% identified as bisexual, and 3.0% identified as lesbian or gay. Most participants were married or living with their partner (66.1%), while 18.5% of the women were single. Additionally, 56.8% of women had a child under the age of 18 living with them. A wide range of religious affiliations were reported, with the most common responses being Catholic (53.5%) and no religious affiliation (18.7%; see Table 1).

The majority of the sample had attained a college degree (56.5%), while 15% had attended some college, 12.6% had completed a graduate program, 6.5% had attended some graduate school, and 5.6% had completed high school. Most women were employed, either full time (75.7%) or part-time (13.3%). Household income ranged from less than $10,000 to over

$75,000, with 36.9% of participants reporting household incomes between $25,000 and $50,000 and 30.1% of participants reporting household incomes between $50,000 and $75,000. Notably, 54% of the women reported an instance of material hardship during their childhood.

Given that this data was collected during the COVID-19 pandemic, the impact of COVID was assessed with several single items. On average, women indicated that the COVID-19 pandemic did not impact their ability to provide food for themselves and their families, their ability to maintain housing, or their ability to afford necessary medical care. Women, on average, reported that the COVID-19 pandemic affected their mental health somewhat negatively.

Measures

Demographics. Demographic information was collected from participants, including age, race/ethnicity, gender identity, sexual orientation, relationship status, parent status, education level, income, and employment status. This study was conducted during the COVID-19 pandemic, which has been found to be a collective trauma that has increased stress levels across the population (M. Holmes et al., 2021) Given the financial and psychological impacts of COVID-19 (Cooney & Shaefer, 2021), perceived personal impact of the pandemic was also assessed for descriptive purposes. Perception of COVID-19 impact on material hardship was assessed by three items (i.e., “How much has the COVID-19 pandemic negatively impacted your ability to provide food for yourself and your family?”), with responses consisting of a Likert scale from not at all to extremely (range 1-5). Perception of COVID-19 impact on mental health was assessed by one item (i.e., “How much as the COVID-19 pandemic negatively impacted your mental health?”), with responses on a Likert scale from not at all to extremely (range 1-5).

Sexual Experiences Scale-Short Form Victimization (SES-SFV). The SES-SFV is a 10-item measure that assesses unwanted sexual experiences both in the past year and since age

14 (Koss et al., 2007). The SES-SFV measures sexual victimization (i.e., completed and attempted rape, completed and attempted oral sex) obtained through threats, incapacitation, and physical force. Traditionally, scores can be created by summing the frequency of each type of unwanted sex act or by assessing the frequency of different levels of severity of unwanted sex acts. However, these methods of scoring may not sufficiently capture the variability in experiences. Davis and colleagues (2014) tested nine scoring methods of the SES to determine the validity of more comprehensive scoring methods. These scoring options demonstrate convergent validity, combining frequency and severity rankings to create continuous variables. For the present study, Davis et al.'s (2014) sum of frequency of ranks method of scoring was utilized. This scoring method takes the severity rank of each endorsed outcome and multiplies it by the frequency reported; these scores are then summed to create a total score. Severity ranks from the SES-SFV range from 0 to 5 (0 = no sexual assault, 1 = unwanted sexual contact, 2 = attempted sexual coercion, 3 = sexual coercion, 4 = attempted rape by physical force or incapacitation, 5 = completed rape by physical force or incapacitation; Davis et al., 2014; Koss et al., 2007). Frequency options range from zero to three or more times. The Cronbach's α for the SES-SFV in this study was .99.

US Adult Food Security Survey Module. The US Adult Food Security Survey Module is a 10-item self-report that measures household food security status in three stages (USDA Economic Research Service, 2012). In the first stage, individuals rate how true certain statements about food have been in the last 12 months (i.e., "The food that I bought just didn't last, and I didn't have money to get more.") on a three-point scale (often true, sometimes true, never true). If an affirmative response is given to any item in stage one, stage two is administered; if "never true" is selected for all statements, participants will screen out of this measure and be given a

score of 0. In samples representative of the US population, about 20 percent of households will screen into stage two (USDA Economic Research Service, 2012). Questions in stage two ask if a situation has occurred in the past year (i.e., “In the last 12 months, were you ever hungry but didn’t eat because there wasn’t enough money for food?”). If participants endorse any symptoms in stage two, stage three is administered. About eight percent of households continue to stage three in samples similar to the general U.S. population (USDA Economic Research Service, 2012). Stage three consists of one yes/no question (i.e., “In the last 12 months, did you ever not eat for a whole day because there wasn’t enough money for food?”). If endorsed, participants are asked to indicate how often that happened – almost every month, some months but not every month, or only one or two months. Scores are calculated by summing affirmative responses. A raw score of 0 indicates high food security, a raw score of 1-2 indicates marginal food security, a raw score of 3-5 indicates low food security, and a raw score of 6-10 indicates very low food security. For the purposes of the present study, the raw score (ranging from 0 to 10) was used as a continuous variable. In this study, the Cronbach’s α for this measure was .93.

Survey of Income and Program Participation (SIPP) – Housing Insecurity Items of the Adult Well-Being Topical Module. The SIPP is a national household-based survey that assesses changes in economic wellbeing over time (US Census Bureau, 1996). One of the few national surveys that assesses material hardship (Nelson, 2011), the eighth wave of the 1996 SIPP survey included an Adult Well-Being Topical Module, which had four items on housing security (i.e., “Was there any time in the past 12 months when you did not pay the full amount of the rent or mortgage?”; US Census Bureau, 1996). These items have been included in several studies of material hardship (Beverly, 2001; S. Holmes et al., 2021a; Karpman et al., 2018; US Department of Health and Human Services, 2004; Weaver et al., 2018). Responses to each item

are dichotomous, indicating the presence or absence of an event. For the present study, endorsement of each item was given a score of one then summed for possible scores ranging from 0 to 4. In this study, the Cronbach's α for these items in this study was .84.

Medical Care Hardship. Mayer & Jencks (1998) developed three items that assess access to needed health care and health insurance. Responses to each item indicate the presence or absence of an event. If the items measuring unmet medical and dental needs are endorsed, the reason for the unmet medical need is also assessed (i.e., lack of money, lack of time, did not know who to see); these items are considered endorsed only if the unmet medical need is due to lack of money. For the present study, endorsement of each item was given a score of one and summed, giving this measure a range of 0 to 3. The Cronbach's α for these items in the present study was .38.

Center for Epidemiological Studies Depression Scale Revised (CESD-R). The CESD-R is a 20-item measure of depressive symptoms (Eaton et al., 2004). Participants rate the frequency of each symptom in the past two weeks (i.e., "I felt sad," "I lost interest in my usual activities"), with two to three items corresponding to each symptom group in the diagnostic criteria for a major depressive episode (American Psychiatric Association, 2013). Response options consist of not at all or less than one day, one to two days, three to four days, five to seven days, or nearly every day for two weeks (range 0-4). Scores are created by summing each item, for a total score ranging from 0 to 80. Higher scores represent a greater frequency of depressive symptoms, with scores of 16 or higher indicating clinical levels of depressive symptoms (Eaton et al., 2004). The Cronbach's α for the CESD-R in this study was .97.

Alcohol Use Disorders Identification Test (AUDIT). The AUDIT is a 10-item measure that assesses past year hazardous and harmful alcohol use, in addition to symptoms of alcohol

dependence (Babor et al., 2001). Items assess frequency of drinking (i.e., “How often during the last year have you found that you were not able to top drinking once you had started?”) and problematic drinking behaviors (i.e., “How often during the last year have you failed to do what was normally expected of you because of drinking?”). Seven items are scored based on frequency, one item is scored based on amount of alcohol consumed, and two items are scored based on the presence or absence of alcohol-related problems. Scores for each item range from 0 to 4, resulting in total scores from 0 to 40. The recommended cut-off score for favorable sensitivity on the AUDIT for women is seven (Babor et al., 2001). In this study, the Cronbach’s α was .93 for the AUDIT items.

Drug Use Disorders Identification Test (DUDIT). The DUDIT is an assessment of drug use patterns and problems in the past year (Berman et al., 2003). Items assess frequency and prevalence of drug use (i.e., “How often are you influenced heavily by drugs?”) and behaviors related to drug dependence (i.e., “Over the past year, have you felt that your longing for drugs was so strong that you could not resist it?”). There are 11 items with scores ranging from zero to four, which are summed for a maximum score of 44. Nine items are scored based on frequency, with responses ranging from never to daily or almost daily, while two items are scored based on the presence or absence of problems. For women, scores of two or more points indicates a likelihood of drug-related problems, while a score of 25 or more represents a high likelihood of drug dependence (Berman et al., 2003). The Cronbach’s α for the DUDIT in this study was .95.

Posttraumatic Stress Disorder Checklist for the DSM-5 (PCL-5). The PCL-5 is a 20-item measure of PTSD symptom presence and severity in the past month (Weathers et al., 2013). Items assess how bothered participants have been by each symptom (i.e., “In the past month, how much were you bothered by repeated, disturbing dreams of the stressful experience?”).

Ratings are made on a Likert scale, ranging from not at all to extremely (range 0-4). Scores are created by summing item scores for a maximum score of 80. Items on the PCL-5 correspond directly with DSM-5 criteria for a PTSD diagnosis, with scores of 33 or higher indicating a probable PTSD diagnosis (Weathers et al., 2013). For the purposes of the present study, participants were asked to answer the PCL-5 items referring to their most serious or best remembered sexual assault since age 14, as reported on the SES-SFV (Ullman et al., 2006). If participants had a score of zero on the SES-SFV, indicating no experiences of adult sexual assault, they were not administered the PCL-5. In this study, Cronbach's α for the PCL-5 was .98.

Flourishing Scale. The Flourishing Scale is an eight-item assessment of psychological wellbeing (Diener et al., 2009). Participants rate the degree to which they agree with each statement (i.e., "I lead a purposeful and meaningful life") on a Likert scale from strongly disagree to strongly agree (range 1-7). Scores are summed for possible scores that range from 8 to 56, with higher scores indicating higher flourishing. The Cronbach's α for these items was .94.

Procedure

The study design, variables, analyses, and hypotheses were preregistered on the Open Science Framework. Study procedures were approved by the university institutional review board (IRB). Participants were recruited from Amazon's Mechanical Turk (MTurk), an online data collection platform. MTurk samples consistently demonstrate high reliability and validity (Chandler & Shapiro, 2016). It has been shown that MTurk is an appropriate avenue to evaluate clinically meaningful symptoms and experiences, including depression, drug abuse, and traumatic events (Shapiro et al., 2013). Further, MTurk samples tend to be more representative of

the population and more diverse (i.e., sexual orientation, employment status) than college samples, community samples recruited in college towns, and other online sources (Chandler & Shapiro, 2016). MTurk samples also tend to have a lower SES than convenience samples (van Stolk-Cooke et al., 2018). Previous research has indicated that trauma-exposed MTurk samples are similar to more traditional samples and generalizable to other trauma-exposed populations (Engle et al., 2020; van Stolk-Cooke et al., 2018). In their study of trauma-exposed MTurk workers, Engle and colleagues (2020) found that MTurk participants exhibit similar prevalence rates of PTSD and depression to undergraduate and community samples.

There are recommendations specific to crowdsourced samples that were followed in this study. First, before the study was posted to the entire sample, it was piloted on a smaller group (N=5) to ensure the entire survey worked properly (Chandler & Shapiro, 2016). Three of the pilot participants had valid responses and were included in the final sample. Two participants did not identify as women and were excluded. Further, attention and seriousness checks were utilized, as they have been found to improve data validity in online data collection (Aust et al., 2013). Multiple attention check items (i.e., "Please select 'strongly agree' if you are paying attention to survey items") was used throughout the study items (Thomas & Clifford, 2017). One item was asked at the end of the survey where participants indicated if they responded to all items seriously (Aust et al., 2013). Responses from participants who failed the attention and/or seriousness checks were removed. Responses were also removed if they were completed in less than 300 seconds (less than three seconds per question), came from the same IP address, or MTurk worker number (Aust et al., 2013; Bardos et al., 2015). Lastly, several measures were initiated to prevent web robots ("bots") from completing the survey. First, a reCAPTCHA was included to prevent automated access to the survey. Next, an open-ended question was utilized to

screen for nonsensical responses. Participants were also asked for their age at the beginning of the survey and their birthdate at the end, and those two data points were compared to ensure the information provided was correct (Cobanoglu et al., 2021). Overall, 369 responses were removed for failing attention checks, 6 were removed for failing the seriousness check, 51 were removed for answering the survey in less than 300 seconds, 111 were removed for nonsensical answers to open-ended questions, and 301 were removed for discrepancies in age and birthday data (total N removed = 838).

A brief study description ("This study asks individuals who identify as women about their experiences of traumatic events, financial difficulties, and mental health and wellbeing.") was posted on MTurk for workers to consider participating. The purpose of the study, informed consent, benefits and risks of participation, and freedom to withdraw from the study were provided before participants began the survey. After participants agreed to the informed consent, they were redirected to the study measures on Qualtrics.

Participants were compensated $0.50 for completing the study, which is greater than the minimum requirement of $0.01 and has been found to effectively recruit quality samples (Tompkins, 2019). After completing the study, participants were directed to a debriefing form that included resources for mental health care and financial assistance.

Data Analysis Plan

Structural Equation Modeling (SEM) was used to assess the aims of this study. SEM is a method of examining structural relations among variables that can help to identify a best fitting model by integrating factors into multiple regression analysis (Ullman, 2014). SEM can be used to address how well a factor reflects its intended constructs, in addition to measuring associations among variables. A confirmatory approach, SEM tests a previously developed theory or

hypothesis. Lastly, SEM accounts for measurement error in the model by examining the relations between latent and observed variables (Ullman, 2014).

The proposed model was tested in MPlus (Muthén & Muthén, 2012). First, demographic variables were tested for significant associations with study variables to determine potential covariates. Then, each measurement model (see Figures 1 and 2) was tested in a confirmatory factor analysis (CFA) to determine the factor loadings of the observed variables for material hardship and psychological distress. Next, the structural model (see Figure 3) was identified. Since there were 45 unique data points and 22 parameters to be estimated, the model was overidentified and could be estimated. After the model was estimated, the fit was assessed. Because the chi square test of model fit is sensitive to large sample sizes, incremental fit indices and root mean square error of approximation (RMSEA) also were used to assess model fit. The Tucker-Lewis index (TLI), and comparative fit index (CFI) compare the tested model with the baseline model (Ullman, 2014). Values of .9 or higher indicate acceptable fit, while values of .95 or higher indicate good fit. The RMSEA compares the tested model with the saturated model, with values of .06 or lower indicating good fit (Ullman, 2014).

To ensure adequate statistical power, a power analysis was conducted to determine a sufficient sample size. MacCallum and colleagues (1996) present a framework for estimating sample size based on the RMSEA. Given there are 45 unique data points and 22 parameters, the model has 23 degrees of freedom. Per MacCallum and colleagues' (1996) recommendations, a minimum sample size between 363 and 435 participants was needed to obtain power of .80 with an alpha value of .05. Thus, recruitment continued until 428 participants with valid responses were retained.

Results

Descriptive Statistics

Descriptive statistics were evaluated using SPSS. A total of 428 women participated in the study, but due to missing data on the sexual assault measure, 424 participants were included in study analyses.

Rates of each type of sexual assault are provided in Table 2. The majority (78.8%) of women endorsed at least one unwanted sexual experience after age 14. Nearly three-fourths of women reported unwanted sexual touch or nonconsensual removal of their clothes (74.5%). Two-thirds (66.0%) of the sample reported attempted rape (oral, vaginal, and/or anal sex) while 69.1% of women reported at least one experience of completed rape (oral, vaginal, and/or anal sex). More than half of the sample reported completed rape by physical force at least once (58.3%) and completed rape by incapacitation at least once (62.3%). Using Davis et al.'s (2014) sum of frequency ranks method of scoring, total scores on the Sexual Experiences Scale ranged from 0 to 312, with a mean of 89.69 (*SD* = 89.87).

Scores on the US Adult Food Security Survey Module ranged from 0 to 10, with a mean of 5.01 (*SD* = 3.79), indicating that women on average fell in the low food security category. Scores ranged from 0 to four (*M* = 1.45, *SD* = 1.57) on the SIPP housing insecurity items, with a majority of women (45%) reporting no housing insecurity. Approximately 13% of women endorsed one item on this measure, indicating marginal housing security, and 19% of women endorsed all four items, indicating very low housing security. Lastly, scores for medical care hardship ranged from 0 to three (*M* = 0.70, *SD* = 0.85), with most women endorsing no (52%) or little (32%) medical care hardship.

The average score on the CESD-R was 30.69 (*SD* = 20.60), which was above the cut-off score of 16 that indicates risk for clinical-levels of depression. AUDIT scores in the present

study ranged from 0 to 35 (*M* = 11.37, *SD* = 10.16). The average score on this measure exceeded the cut-off score of seven for hazardous and harmful alcohol use in women. Scores on the DUDIT ranged from 0 to 42. Most women scored 0 (43%), indicating no drug use. The mean score on the DUDIT was 8.64 (*SD* = 10.50), while the median score was 3.00; thus, women who did endorse drug use scored, on average, in a range indicative of drug-related problems, exceeding the cut-off score of two. The PCL-5 was not administered to participants who denied any unwanted sexual experiences since age 14 (21.2%). For the 301 women who reported unwanted sexual experiences, PCL-5 scores ranged from 0 to 80, with the average score exceeding the clinical cut-off of 33 for a probable PTSD diagnosis (*M* = 38.05, *SD* = 21.29). Lastly, scores on the Flourishing Scale ranged from 8 to 56, with a mean of 40.21 (*SD* = 9.56).

Preliminary Analyses

SEM Assumptions

The data fit the assumptions of SEM. First, the data showed multivariate normality based on having no outliers in the data, in addition to low levels of skew and kurtosis of each variable (see Table 3; Ullman, 2014). Further, there were linear relations between variables. SEM also requires the absence of multicollinearity. Depression and PTSD were highly correlated (*r* = .79), in addition to alcohol use and drug use problems (*r* = .77), and were allowed to covary in the model to adjust for this. Lastly, residuals were small and centered around zero (standardized estimates ranged from .22-.47).

Missing Data

The amount of missing data for study variables ranged from 0%, for food insecurity, housing insecurity, and AUDIT, to 29.9% for the PCL-5. The missing data patterns demonstrate that the missing data in the sample was primarily due to participants (N=92) not being

administered the PCL-5 if they did not report an unwanted sexual experience since age 14. For 25 participants, either the CESD-R, DUDIT, medical care hardship items, or Flourishing Scale were not administered when the survey was adjusted to detect bots. The remainder of the missing data were due to participants not completing the survey. These missing data patterns indicate the missing data was Missing at Random (MAR), as the missing data is related to other measured variables in the model (Enders, 2010); in this case, missing PCL-5 scores were dependent on reported unwanted sexual experiences. FIML was used to address missing data as it can specifically address MAR data. FIML estimates parameters and standard errors for missing data based on observed data instead of imputing data (Graham, 2009).

Preliminary Analyses

Variables demonstrated associations in the expected directions, except for medical care hardship (Table 4). Medical care hardship was positively associated with food and housing insecurity, but not significantly related to any other study variables. Demographic variables (age, race/ethnicity, education level, and sexual orientation) were assessed for significant relations with outcome variables to determine what, if any, covariates should be included in the analyses. Due to low numbers in some categories, race/ethnicity and sexual orientation were dichotomized (0,1) and education was collapsed into four levels to test for significant associations between these demographic variables and the outcome variables. The only significant association was between education and drug use problems ($F(3, 420) = 2.69$, $p < .05$). Thus, education level was included as a covariate in the study analyses.

Primary Analyses

Measurement Models

Models were estimated using maximum likelihood (ML), as the data were multivariate normal and ML output includes chi-square values, which was utilized to determine model fit (Kelloway, 2015). Confirmatory factor analysis (CFA) was used to identify the measurement model in hypotheses 1 and 2. Due to the available degrees of freedom, one measurement model was tested with the latent variables and observed indicators for both material hardship and psychological distress (Figure 4, Table 5). The original proposed measurement model resulted in a negative residual variance for food insecurity and poor model fit indices. Medical care hardship had a low factor loading ($\beta = .19$, SE = .05), low variance, and was not highly correlated with food and housing insecurity ($r = .27$ and .13, respectively). Thus, medical hardship was removed from the model of the latent variable for material hardship to test for better fit. With only food insecurity and housing insecurity loading onto material hardship, the model fit improved ($\chi^2(8) = 109.70$, $p < .001$, *RMSEA* = .17, *CFI* = .93, *TLI* = .88) offering partial support for hypothesis 1. Next, the observed variables, depression and PTSD and alcohol use and drug use were highly correlated ($r = .79$ and .77, respectively) and modification indices recommended allowing the errors for these variables to covary. First, allowing depression and PTSD error terms to covary improved fit ($\chi^2(7) = 28.13$, $p < .001$, *RMSEA* = .08, *CFI* = .99, *TLI* = .97), and the final model included covarying error terms for alcohol use and drug use as well ($\chi^2(6) = 13.66$, $p = .037$, *RMSEA* = .05, *CFI* = .995, *TLI* = .99). These loadings and fit indices offer support for the hypothesized latent distress variable (hypothesis 2). While nonsignificant chi-square values are indicative of good model fit, the chi-square significance test is sensitive to large sample sizes. Therefore, converting this to a z-score by dividing the chi-square value by the degrees of freedom is another way to assess model fit (Hu & Bentler, 1999; Schumacker & Lomax, 2010). Z-score values less than 5 are suggestive of good fit. With the z-score below 5 ($\chi^2/df = 2.28$),

RMSEA below .06, and the CFI and TLI above .95, this model demonstrated good fit and was therefore used as the measurement model for material hardship and psychological distress.

Identification of the Structural Model

Next, the additional observed variables representing unwanted sexual experiences, flourishing, and education were added to the model to test the hypotheses (χ^2 (14) = 76.12, p <.001, *RMSEA* = .10, *CFI* = .97, *TLI* = .94). This model demonstrated poor fit. First, the path coefficient for education was low and not significantly associated with psychological distress in the model (β = .004, SE = .03, p = .91), so education was dropped from further analyses. Next, the path coefficient for flourishing regressed on unwanted sexual experiences was low and non-significant (β = -.04, SE = .06, p = .54) and flourishing was not significantly associated with distress (β = -.10, SE = .07, p = .20). In addition, the path coefficient for flourishing regressed on material hardship was also low, although significant (β = -.18, SE = .07, p = .007). Next, the model was tested while constraining the path between flourishing and distress to 0. This model demonstrated similar poor model fit (χ^2 (15) = 77.77, p <.001, *RMSEA* = .09, *CFI* = .97, *TLI* = .94). Thus, given that the model including both distress and flourishing did not demonstrate acceptable fit, two separate models were assessed, one with distress as the outcome variable and one with flourishing as an outcome, in order to test the stated hypotheses. The model with flourishing did not show a significant association between flourishing and unwanted sexual experiences (β = -.004, SE = .01, p = .54). There was a significant negative association between material hardship and flourishing (β = -.18, SE = .07, p = .01) but the overall model was not acceptable. Thus hypothesis 3 that unwanted sexual experiences would be associated negatively with flourishing was not supported. It was also not possible to regress flourishing on the interaction of SES and material hardship given the poor fit of this model. The model with

psychological distress demonstrated good fit with an insignificant chi-square, RMSEA below .06, and CFI and TLI values over .95 (χ^2 (10) = 15.67, p = .11, *RMSEA* = .04, *CFI* = .997, *TLI* = .99), and was used as the full model to test the moderation (see Figure 5, Table 6).

Moderation Analyses

Using the structural model described above, the interaction between unwanted sexual experiences and material hardship was added to the model to test hypothesis 5. The main effect of psychological distress regressed on material hardship was significant (β = .55, SE = .06, p <.001, 95% CI [.43, .67]), suggesting that higher levels of material hardship were associated with higher levels of psychological distress. The main effect of unwanted sexual experiences regressed on psychological distress was also significant (β = .47, SE = .04, p <.001, 95% CI [.39, .56]), indicating that increased frequency and severity of unwanted sexual experiences were associated with higher levels of psychological distress. The R^2 for the model was 0.781, indicating that 78.1% of the variance in psychological distress was explained by sexual assault and material hardship. When regressed on psychological distress, the interaction term was not significant (β = -.04, SE = .05, p = .40, 95% CI [-.009, .004]) and thus did not offer support for hypothesis 5. This would suggest that the impact of unwanted sexual experiences on psychological distress does not vary at different levels of material hardship.

Discussion

The present study aimed to investigate the associations among sexual assault, material hardship, and women's current psychological distress and flourishing. This is the first study to date to examine the concurrent impact of sexual assault and material hardship on multiple mental health outcomes in a single model. Results suggest that both sexual assault and material hardship are independently associated with psychological distress. However, the relation between sexual

assault and psychological distress was not moderated by material hardship, such that the association between sexual assault and psychological distress does not vary depending on an individual's level of material hardship. Additionally, flourishing was significantly associated with material hardship, but not sexual assault or psychological distress.

The rate of sexual assault reported by women in this sample (78.8%) was higher than many previous samples of women (e.g., Smith et al., 2018), including MTurk samples. In a trauma-exposed MTurk sample, 19.3% of participants reported an experience of sexual assault (van Stolk-Cooke et al., 2018). In a more recent sample of women, Watters and Yalch (2022) found that 60% of their MTurk sample reported adulthood sexual assault.

Women in this sample also reported high levels of material hardship compared to previous research. It is important to note that three-fourths of the sample indicated full time employment and completing college, but still were experiencing material hardship. In the present study, 66.4% of women had low food security, compared to 23.3% in a study by Karpman and colleagues (2018) that oversampled low-income participants. Their study found that 13.0% of individuals missed a utility bill payment, while 10.2% missed a rent or mortgage payment, 4.3% had their utilities turned off, and 1.1% were evicted. In the present study, 55.4% of women endorsed at least one of those experiences in the past year, and 42.3% endorsed at least two, which is representative of low housing security. Lastly, 49.1% of women in the present study endorsed any medical care hardship while medical care hardship was present in 17.8% of Karpman and colleagues' sample (2018). However, these rates may be related to findings from previous research that has shown that MTurk samples typically have a lower SES than other convenience samples (van Stolk-Cooke et al., 2018). Notably, participants on average reported that the COVID-19 pandemic did not have an impact on their levels of material hardship.

Further, women in this sample also endorsed high rates of psychological distress. While the twelve-month prevalence of depression in the general population is 7% (APA, 2013), the rates in MTurk studies have varied widely. One study found that only 5% of adults had clinically significant depressive symptoms in the past year (Shapiro et al., 2013), while other studies have found rates that are much higher. van Stolk-Cooke and colleagues (2018) found that 27.7% of their sample had moderate to severe symptoms of depression in the past two weeks, and Price and colleagues (2019) found that 32% of their sample scored in the range for probable depression. The results of the current study exhibit prevalence rates of depression that are more than double what has been seen in other MTurk studies, with 67.0% reporting clinically significant levels of depression in the two weeks prior to the survey. The participants also reported high levels of substance use. Another MTurk sample of 443 individuals found that 37.1% of participants exhibited alcohol or drug use problems (Shapiro et al., 2013), while 50.9% of women in this sample scored in the range for problematic alcohol or drug use. Lastly, probable PTSD rates are also higher in the present study than other MTurk studies. In one trauma-exposed MTurk sample, 11% of participants had scores that indicated probable PTSD (Engle et al., 2020), while another trauma-exposed MTurk sample had 19.8% of respondents score in the probable PTSD range. The present sample had a probable PTSD prevalence rate of 61.8% in women with a history of sexual assault. However, this discrepancy could be related to previous research that suggests sexual assault is associated with worse psychological outcomes than other types of trauma (Dworkin, 2018). In addition, it is important to recall that the participants indicated their mental health was negatively impacted during the COVID-19 pandemic and that this may be reflected in the higher rates reported by the women. Finally, the study description noted that participants would be asked about traumatic experiences and mental

health and thus participants with more trauma exposure and mental health concerns may have elected to participate.

Regarding study hypotheses, hypotheses 1 and 2 were related to the proposed measurement models for SEM. Hypothesis 1, that food insecurity, housing insecurity, and medical care hardship would load onto the latent variable of material hardship, was partially supported. Medical care hardship had low internal consistency and low correlations with food and housing insecurity and was removed from the model, but food and housing insecurity loaded onto the factor representing material hardship with good model fit. Hypothesis 2, that depressive symptoms, alcohol use problems, drug use problems, and PTSD symptoms would load onto the latent variable of psychological distress, was supported. The variables were all significantly associated with one another and after depression and PTSD, then alcohol and drug use were allowed to covary in the model, the psychological distress model demonstrated good fit. After a sexual assault, comorbid psychological disorders often emerge (e.g., depression and PTSD, PTSD and substance use disorders, or depression and substance use disorders). Therefore, including several types of psychological distress in one model offers a more holistic picture of common mental health presentations after an experience of sexual assault and has the potential to inform treatment interventions for sexual assault survivors.

Hypothesis 3 proposed that sexual assault would be significantly associated with higher rates of current psychological distress and lower levels of flourishing. This hypothesis was partially supported, as sexual assault was significantly associated with psychological distress but not decreased flourishing in the SEM models. Sexual assaults were significantly and negatively correlated with flourishing but this relation was not supported in the SEM analyses when accounting for the association between sexual assaults and distress. The significant association

between sexual assault and psychological distress in this sample are consistent with the existing body of literature on sexual assault and psychological distress in the forms of depression, alcohol use problems, drug use problems, and PTSD (Campbell et al., 2009; Chen et al., 2010; Dworkin, 2018). These results also extend the literature as multiple, distinct forms of psychological distress were assessed in the same model, beyond broad mental health functioning (Fedina et al., 2020). Next, as noted previously, the findings on sexual assault and wellbeing or flourishing are mixed (Borja et al., 2006; Kashdan et al., 2020; Schindler, 2021). The results of this study may inform our understanding of these mixed results by identifying that there is not a significant association between sexual assault and flourishing when psychological distress is included in the analyses.

Hypothesis 4, that experiences of material hardship would be significantly associated with higher rates of current psychological distress and lower levels of flourishing, was also partially supported. First, in support of the hypothesis, material hardship was significantly associated with psychological distress. Most of the existing research on mental health and poverty focuses on income poverty (Bryant-Davis et al., 2010; Ribeiro et al., 2017). However, studies that have assessed mental health in the context of more specific types of hardship have typically evaluated hardships independently (Diette & Ribar, 2018; Nagata et al., 2020; Whittle et al., 2019). Similarly, studies that have assessed material hardship and mental health previously have assessed either mental health in general or psychological disorders individually (Fedina et al., 2020; Heflin & Iceland, 2009; S. Holmes et al., 2021b; Huang et al., 2021; McCarthy et al., 2018). Therefore, this study extends the literature to show that the results of previous studies are maintained when food and housing insecurity are evaluated concurrently as specific forms of hardship, in addition to multiple common expressions of psychological distress.

Notably, flourishing could not be tested in the full model, so hypothesis 4 could not be tested with the SEM analysis. When examined independently, flourishing was negatively correlated with both housing and food insecurity. To date, there have been no studies conducted on material hardship and flourishing. While previous research has found associations between income and flourishing (de la Fuente et al., 2020; Huppert & So, 2009), this finding expands this literature to suggest that material hardship is a relevant contextual factor to consider when assessing flourishing.

Lastly, hypothesis 5 proposed that sexual assault and material hardship would interact and have a significant association with higher rates of psychological distress, in addition to lower levels of flourishing. This hypothesis was not supported. First, flourishing was dropped from the model and an interaction effect could not be tested for flourishing. Next, the interaction effect of sexual assault and material hardship was not significantly related to psychological distress, suggesting that material hardship does not moderate the relation between sexual assault and psychological distress. Said another way, the association between sexual assault and psychological distress does not change based on differing levels of material hardship. The simultaneous test of sexual assault and material hardship in the same model is a novel aspect of the present study, and while there was not a significant interaction, material hardship and sexual assault were each independently associated with psychological distress.

Further, although the interaction between material hardship and sexual assault was not significant, these two variables were significantly related to one another. Sexual assault's association with food and housing insecurity is consistent with the few studies that have been conducted with these variables (Becker et al., 2018; Diette & Ribar, 2018). However, as studies previously have evaluated these constructs separately, the present study found that food and

housing insecurity together, representing material hardship more broadly, were related to sexual assault. These findings align with a structural violence perspective, as this theory posits that social structures maintain an unequal distribution of harm and risk, which can be related to gender and lack of resources (Leatherman & Goodman, 2011; Rylko-Bauer & Farmer, 2016). This inequality of risk is consistent with the association between increased material hardship and high frequency and severity of sexual assault. The results of this study suggest that sexual assault may increase in the context of greater material hardship, or that material hardship may increase in the context of higher frequency and severity of sexual assault. Previous research has demonstrated that this reciprocal relationship exists between socioeconomic status and sexual assault (Black et al., 2014; Byrne et al., 1999; Loya, 2014), and the present study supports the presence of this reciprocal relationship between material hardship and sexual assault, as well. An important next step for this area of research will be longitudinal designs that allow us to better understand the relation between these two variables.

Importantly, flourishing did not fit in the model with material hardship, sexual assault, and psychological distress, as it was not associated with sexual assault. It is possible that this is due to individual differences in response to a traumatic event, as more resilient individuals may experience posttraumatic growth while other individuals may experience steep declines in flourishing, such as a lack of purpose or meaning in life (Borja et al., 2006; Kashdan et al., 2020; Schindler, 2021). Thus, the mechanism behind these individual differences may not have been accounted for in the present study. Alternatively, as flourishing consists of feeling good and functioning effectively in daily life, more recent stressors may have a larger effect on flourishing than past experiences, even if those experiences were traumatic. For example, while items such as “My social relationships are supportive and rewarding” and “I am engaged and interested in

my daily activities" could be impacted by sexual trauma, they are also influenced by the individual's current environment, including their living situation, work, and structural inequities in society, and the individual's current state, including their physical health and spirituality or religiosity (Hodgetts et al., 2016; VanderWeele, 2017). Another recent stressor to consider in light of these results is the COVID-19 pandemic. As many participants reported that the pandemic negatively affected their mental health, flourishing may have also been negatively affected.

Limitations

This study has limitations that should be considered when interpreting the results. First, the cross-sectional design of the study does not allow for inferences about causal relationships among the study variables. Future research examining these variables with a longitudinal design would be necessary to determine causality, such as whether sexual assault leads to material hardship or vice versa. In addition, medical care hardship was not associated with sexual assault, in contrast to prior research that found a positive relation between the two (Kapur & Windish, 2011). However, a large majority of participants endorsed no or low medical care hardship, so there may not have been enough variance to find an effect in the present sample. Additional replication of findings specific to medical care hardship should be conducted to determine its place, if any, in material hardship. Next, as data collection took place, the researcher observed bot attacks (fake responses) and took several steps to prevent collecting fake data. While many bot prevention methods were utilized in the present study (e.g., reCAPTCHA, attention checks, data consistency checks, screening of open-ended responses), it is possible that bots were able to appear as real participants and that some were included in this sample. Lastly, generalizability must be considered. As most of the sample identified as White, the results may not be

generalizable to individuals of other ethnicities. Further, while participants had the option to select all that apply or provide a write-in response when reporting their gender, the sample predominantly consisted of cisgender women. This also limits generalizability to other marginalized gender identities (e.g., nonbinary, trans) that are also at increased risk for sexual violence (Martin-Storey et al., 2018). However, the sample did demonstrate a wide range of ages and incomes, which aids in the generalizability of the results.

Implications

Results of the present study have implications for both research and clinical practice. First, there is preliminary support for material hardship through SEM as a latent construct consisting of food and housing insecurity, which is an expansion of the current literature (Beverly, 2001; Karpman et al., 2018; Mayer & Jencks, 1989). Replication in a broader sample is necessary, including a more racially diverse sample and a sample with a greater range of medical care hardship. Eventually, a standardized measure of material hardship is needed to continue to measure need beyond income. Researchers in this area should evaluate the items used to assess medical care hardship, given that items were only endorsed if participants did not access medical care explicitly due to cost. However, researchers should also consider other financial barriers to medical care, such as lack of transportation or lack of access to affordable childcare.

Future research on flourishing after traumatic experiences is also needed, given that the models with flourishing had poor fit for the present data and flourishing was not associated with sexual assault. While many women in this sample demonstrated clinical-level symptoms of psychological disorders, functioning can also be affected by subclinical levels of distress, such as lower degrees of flourishing. Further, understanding individual-level differences, such as

resilience, in flourishing after a traumatic experience (decrease in flourishing vs. posttraumatic growth) is critical for addressing treatment needs.

The results of this study also have implications for clinical practice with women who have experienced sexual assault. Results of the present study are consistent with previous studies indicating that many mental health problems present comorbidly after sexual assault (Ullman & Brecklin, 2003; Hedtke et al., 2008). Comorbid psychological disorders in clients presenting with trauma can be addressed efficaciously using transdiagnostic approaches (Gutner & Presseau, 2019). These findings also highlight the importance of considering contextual factors like decreased access to resources in the relation between trauma and mental health. Previous research has shown that contextual factors affect how individuals cope with stressful experiences, and having fewer resources has been associated with increased substance use to cope (Assari et al., 2019; Rhew et al., 2020). Further, as material hardship is associated with psychological distress, clinicians cannot only address a client's psychological needs, but also should assess to what extent a client's material needs may be interfering with treatment. Referring clients to food banks, government programs, or other service programs may prove to be critical in decreasing psychological distress, especially for clients experiencing high levels of material hardship. However, individuals that experience increased material hardship have many barriers to accessing treatment, including stigma, time, transportation, and childcare (Slaunwhite, 2015). Thus, understanding the prevalence of trauma-exposure and related psychological distress in populations experiencing material hardship allows for the planning and funding of adequate treatment resources (Wahlbeck et al., 2017).

Conclusion

The present study found that both sexual assault and material hardship are independently associated with psychological distress in the form of depressive symptoms, substance use problems, and PTSD symptoms. The high rate of sexual assault reported by women in this sample demonstrates the necessity of understanding how those experiences are linked to mental health. Further, the results also demonstrate the utility of assessing hardship beyond income poverty as it relates to mental health to better inform planning and support services offered to women.

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Table 1

Demographics of Participants

Demographic Variable	N	%
Race/Ethnicity		
White/Caucasian/European American	351	82%
Black/African American	29	6.8%
Asian/Asian American	21	4.9%
Biracial	13	3%
Hispanic/Latina/Latinx	9	2.1%
Native American/American Indian	5	1.2%
Sexual Orientation		
Heterosexual	331	77.3%
Bisexual	76	17.8%
Gay/Lesbian	13	3.0%
Asexual	4	0.9%
Other	4	0.9%
Relationship Status		
Single	79	18.5%
Married/Living with partner	283	66.1%
Divorced/Separated	19	4.5%
In a relationship	44	10.3%
Widowed	3	0.7%
Parent		
Yes	302	70.6%
No	126	29.4%
Level of Education		
Some high school	2	0.5%
Completed high school/GED	27	6.3%
Some college	64	15%
Technical degree	11	2.6%
College degree	242	56.5%
Attended/Completed a graduate program	82	19.1%
Religious Affiliation		
Buddhist	6	1.4%
Protestant	49	11.4%
Catholic	229	53.5%
Non-denominational/Other Christian	47	11.0%
Jewish	6	1.4%
Hindu	3	0.7%
Muslim	2	0.5%
Other	6	1.4%
None	80	18.7%
Employment Status		
Employed full-time	324	75.7%

Employed part-time	57	13.3%
Retired	15	3.5%
Unemployed	17	4.0%
Other (student, disabled)	15	3.5%
Total Household Income		
Less than $10,000	12	2.8%
$10,000-$15,000	12	2.8%
$15,000-$25,000	38	8.9%
$25,000-$50,000	158	36.9%
$50,000-$75,000	129	30.1%
Over $75,000	79	18.5%
Material Hardship During Childhood		
Yes	231	54.0%
No	197	46.0%

Table 2.

Sexual Assault Prevalence Since Age 14

Type of Sexual Assault (N=424)	N	%
Nonconsensual sexual touching and/or removal of clothes	316	74.5%
Attempted rape	280	66.0%
Oral sex	256	60.4%
Vaginal sex	248	58.5%
Anal sex	215	50.7%
Completed rape	293	69.1%
Oral sex	265	62.5%
Vaginal sex	276	65.1%
Anal sex	226	53.3%
Incapacitated rape	264	62.3%
Rape by physical force	247	58.3%

Table 3.

Descriptive Statistics for Study Variables

Variable	*M*	*SD*	*n*	Skew	Kurtosis
SES-SFV	89.69	89.87	424	0.66	-0.71
Food Insecurity	5.01	3.79	428	-0.05	-1.54
Housing Insecurity	1.45	1.57	428	0.55	-1.27
Medical Care Hardship	0.70	0.85	422	1.05	0.30
CESD-R	30.69	20.60	421	0.10	-1.15
AUDIT	11.37	10.16	428	0.43	-1.17
DUDIT	8.64	10.50	424	0.94	-0.39
PCL-5	38.05	21.29	301	-0.37	-1.17
Flourishing	40.21	9.56	420	-0.83	0.71

Table 4.

Correlation Matrix

	SES-SFV	Food Insecurity	Housing Insecurity	Medical Care Hardship	CESD-R	AUDIT	DUDIT	PCL-5	Flourishing
SES-SFV	1								
Food Insecurity	.498**	1							
Housing Insecurity	.520**	.710**	1						
Medical Care Hardship	.077	.271**	.130**	1					
CESD-R	.587**	.528**	.518**	.058	1				
AUDIT	.673**	.547**	.591**	-.032	.642**	1			
DUDIT	.550**	.493**	.552**	-.020	.558**	.765**	1		
PCL-5	.627**	.578**	.524**	.022	.786**	.729**	.581**	1	
Flourishing	-.189*	-.184**	-.185**	-.094	-.383**	-.115*	-.122*	-.110	1

***Correlation is significant at the .01 level (two-tailed)*
**Correlation is significant at the .05 level (two-tailed)*

Table 5.

Measurement Models

Measurement Model Description	Estimate	S.E.	Est./S.E.	p-value
Material Hardship By:				
Food Insecurity	.831	.024	34.365	.000
Housing Insecurity	.855	.023	36.391	.000
Psychological Distress By:				
CESD-R	.758	.029	26.337	.000
AUDIT	.853	.023	36.805	.000
DUDIT	.742	.031	24.237	.000
PCL-5	.853	.024	34.843	.000

Note. Estimates are standardized.

Table 6.

Structural Model

Structural Model Description	Estimate	S.E.	Est./S.E.	p-value
Psychological Distress ® Material Hardship	.516	.045	11.379	.000
Psychological Distress ® Unwanted Sexual Experiences	.470	.043	10.877	.000
Psychological Distress ® Interaction	-.039	.046	-.850	.396

Note. Estimates are standardized.

Figure 1

Proposed Measurement Model of Material Hardship

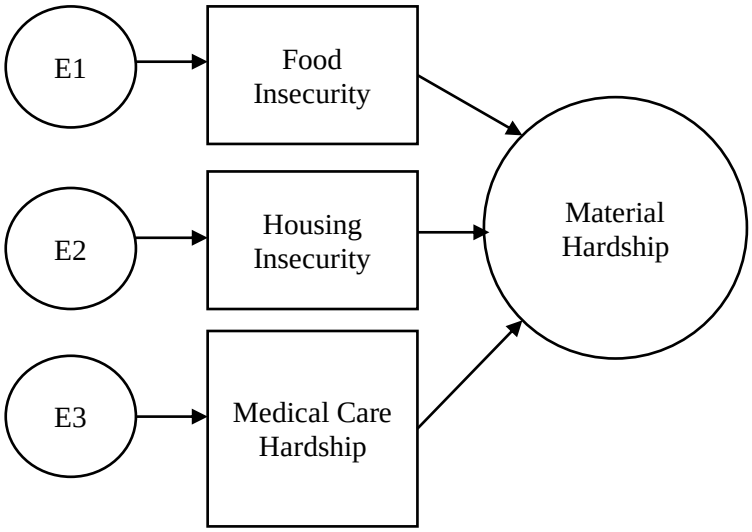


Figure 2

Proposed Measurement Model for Psychological Distress

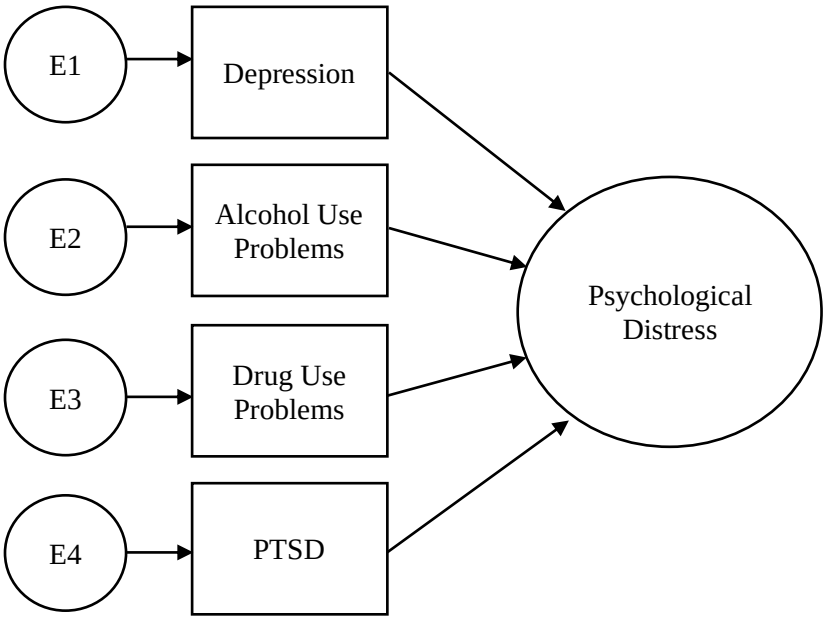


Figure 3

Proposed Structural Model

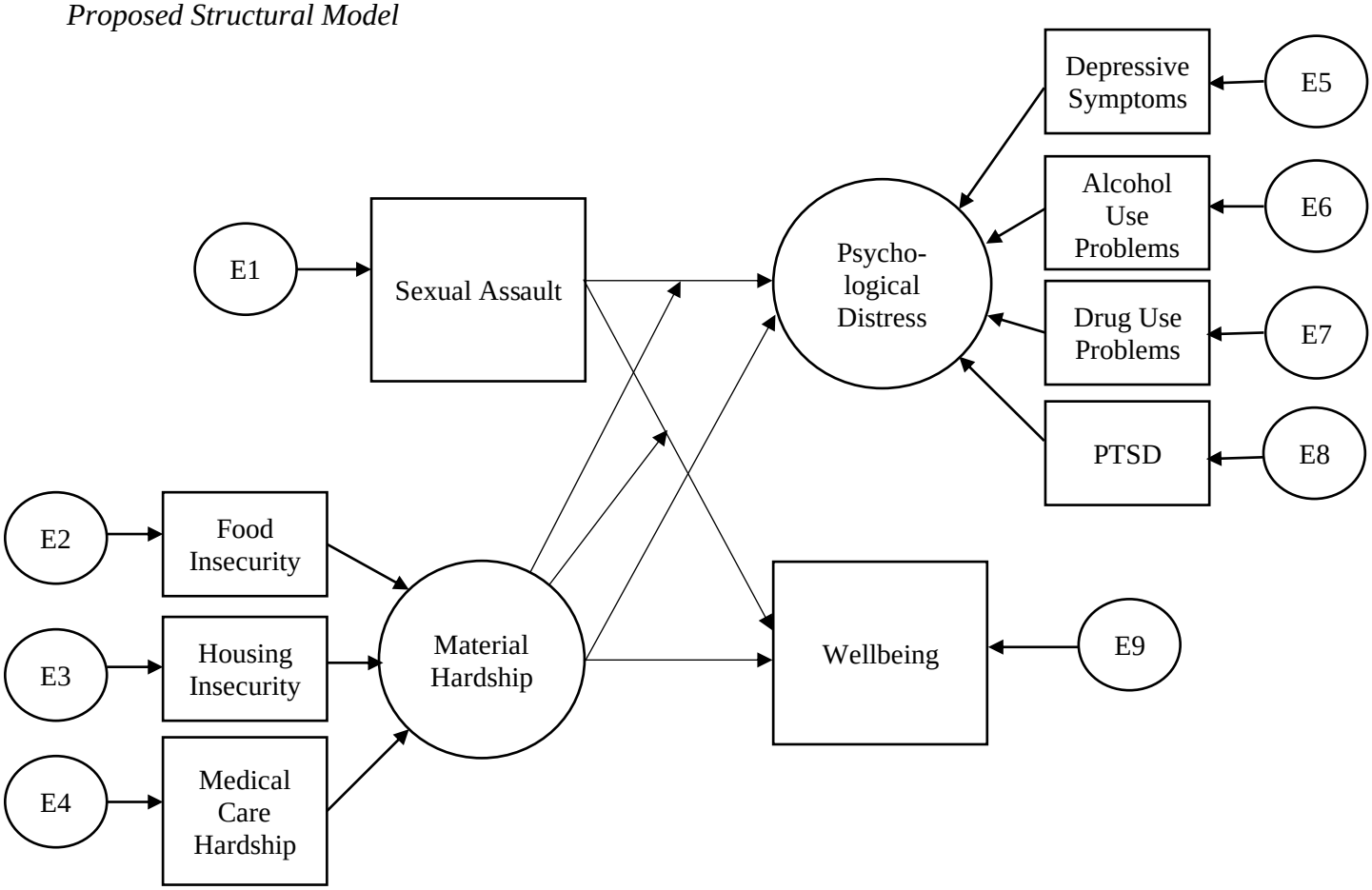
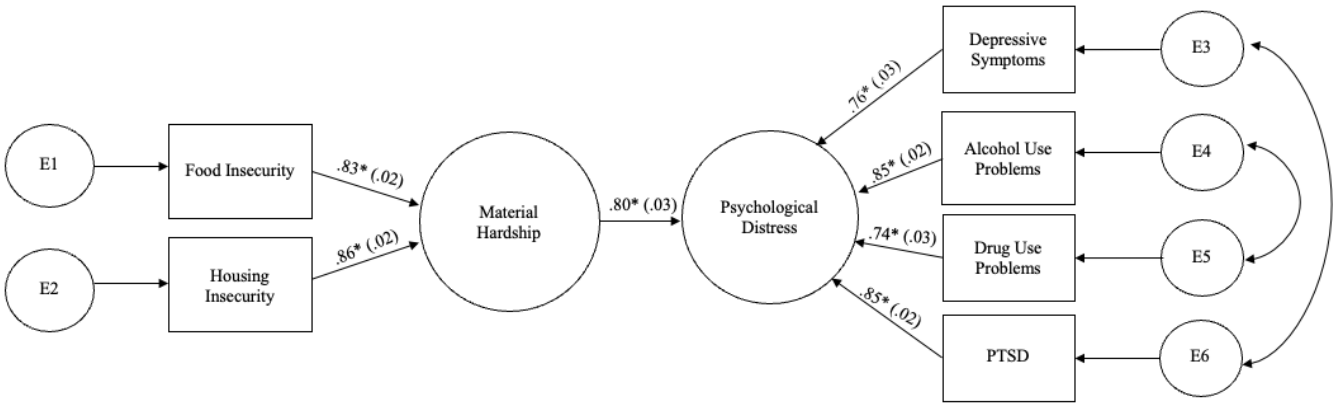


Figure 4.

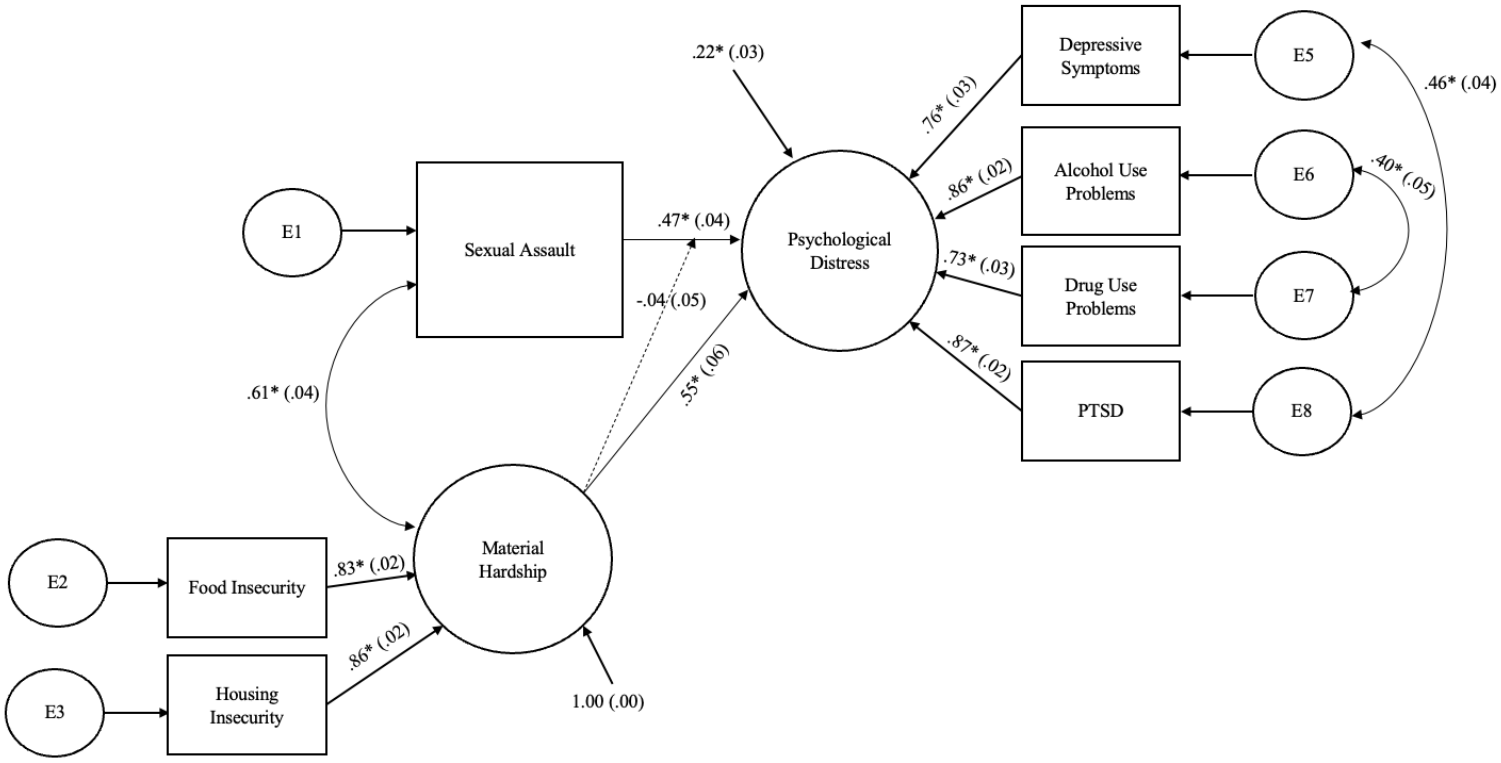
Measurement Model



Note. Estimates are standardized.
**p<.001*
χ^2 (6) = 13.66, *p* = .037, *RMSEA* = .05, *CFI* = .995, *TLI* = .99

Figure 5.

Structural Model



Note. Estimates are standardized.
**p<.001*
R^2 = .781

Appendices

Appendix A: Demographics Questionnaire

1. **Date of birth: __/__/____**

   Age: ____

2. **How do you identify your gender?**
   ____ (1) Man
   ____ (2) Woman
   ____ (3) Trans
   ____ (4) Non-binary/gender fluid
   ____ (5) Other, please describe: _____
   ____ (6) Prefer not to disclose

3. **What is your sexual orientation?**
   a. Heterosexual/straight
   b. Lesbian/gay
   c. Bisexual
   d. Asexual
   e. Other, please describe: _____

4. **What is your race or ethnic background? (select all that apply)**

   a. White/Caucasian/European-American
   b. Hispanic/Latina/Latinx
   c. African-American/Black
   d. Asian-American/Asian
   e. Native Hawaiian/Pacific Islander
   f. Middle Eastern/North African
   g. Native American/American Indian
   h. Other, please describe: _____

5. **Highest level of Education Completed:**

   a. Some high school
   b. Completed high school
   c. GED
   d. Technical degree
   e. Some college
   f. College graduate
   g. Some graduate school
   h. Completed a graduate program

6. What is your religious preference/affiliation?

____ Protestant	____ Jewish
____ Catholic	____ Muslim
____ Buddhist	____Non-denominational
____ Hindu	____ LDS
____ None	____ Other, please describe: _____

7. What is your employment status?

a. Unemployed
b. Employed part-time
c. Employed full-time
d. Retired
e. Other, please describe: _____

8. Which of the following best represents your total household income before taxes in the past year?

a. Less than $10,000
b. $10,000-$15,000
c. $15,000-$25,000
d. $25,000-$50,000
e. $50,000-$75,000
f. Over $75,000

9. What is your current relationship/marital status?

a. Single
b. In a relationship
c. Married/Live with partner
d. Divorced
e. Separated
f. Widowed

10. Are you a parent?

[] Yes
[] No

11. How has the COVID-19 pandemic impacted…

a. your ability to provide food for yourself and your family?
   (1) Extremely negatively
   (2) Somewhat negatively
   (3) Not at all
   (4) Somewhat positively
   (5) Extremely positively
b. your ability to maintain housing?
   (1) Extremely negatively
   (2) Somewhat negatively

(3) Not at all
(4) Somewhat positively
(5) Extremely positively

c. your ability to afford necessary medical care?
(1) Extremely negatively
(2) Somewhat negatively
(3) Not at all
(4) Somewhat positively
(5) Extremely positively

d. your mental health?
(1) Extremely negatively
(2) Somewhat negatively
(3) Not at all
(4) Somewhat positively
(5) Extremely positively

Appendix B: Sexual Experiences Survey-Short Form Victimization (SES-SFV)

The following questions concern sexual experiences that you may have had that were unwanted. We know that these are personal questions, so we do not ask your name or other identifying information. Your information is completely confidential. We hope that this helps you to feel comfortable answering each question honestly. Place a check mark in the box ( ) showing the number of times each experience has happened to you. If several experiences occurred on the same occasion—for example, if one night someone told you some lies and had sex with you when you were drunk, you would check both boxes a and c. "The past 12 months" refers to the past year going back from today. "Since age 14" refers to your life starting on your 14th birthday and stopping one year ago from today.

Sexual Experiences	How many times in the past 12 months?				How many times since age 14?			
1. Someone fondled, kissed, or rubbed up against the private areas of my body (lips, breast/chest, crotch or butt) or removed some of my clothes without my consent *(but did not attempt sexual penetration)* by:	0	1	2	3+	0	1	2	3+
a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐	☐	☐	☐	☐	☐	☐	☐
d. Threatening to physically harm me or someone close to me.	☐	☐	☐	☐	☐	☐	☐	☐
e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐	☐	☐	☐	☐	☐	☐	☐
2. Someone had oral sex with me or made me have oral sex with them without my consent by:								
a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐	☐	☐	☐	☐	☐	☐	☐
d. Threatening to physically harm me or someone close to me.	☐	☐	☐	☐	☐	☐	☐	☐
e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐	☐	☐	☐	☐	☐	☐	☐
3. If you are a male, check box and skip to item 4 ☐								
A man put his penis into my vagina, or someone inserted fingers or objects without my consent by:								
a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐	☐	☐	☐	☐	☐	☐	☐
d. Threatening to physically harm me or someone close to me.	☐	☐	☐	☐	☐	☐	☐	☐
e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐	☐	☐	☐	☐	☐	☐	☐
4. A man put his penis into my butt, or someone inserted fingers or objects without my consent by:								
a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐

Sexual Experiences	How many times in the past 12 months? 0	1	2	3+	How many times since age 14? 0	1	2	3+
c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐	☐	☐	☐	☐	☐	☐	☐
d. Threatening to physically harm me or someone close to me.	☐	☐	☐	☐	☐	☐	☐	☐
e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐	☐	☐	☐	☐	☐	☐	☐
5. Even though it did not happen, someone TRIED to have oral sex with me, or make me have oral sex with them without my consent by:								
a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐	☐	☐	☐	☐	☐	☐	☐
d. Threatening to physically harm me or someone close to me.	☐	☐	☐	☐	☐	☐	☐	☐
e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐	☐	☐	☐	☐	☐	☐	☐
6. If you are male, check this box and skip to item 7. ☐ Even though it did not happen, a man TRIED to put his penis into my vagina, or someone tried to stick in fingers or objects without my consent by:								
a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐	☐	☐	☐	☐	☐	☐	☐
d. Threatening to physically harm me or someone close to me.	☐	☐	☐	☐	☐	☐	☐	☐
e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐	☐	☐	☐	☐	☐	☐	☐
7. Even though it did not happen, a man TRIED to put his penis into my butt, or someone tried to stick in objects or fingers without my consent by:								
a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐	☐	☐	☐	☐	☐	☐	☐
c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐	☐	☐	☐	☐	☐	☐	☐
d. Threatening to physically harm me or someone close to me.	☐	☐	☐	☐	☐	☐	☐	☐
e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐	☐	☐	☐	☐	☐	☐	☐

8. I am: Female ____ Male ____. My age is _____ years and _____ months.

9. Did any of the experiences described in this survey happen to you one or more times?
Yes ____ No _____

What was the sex of the person or persons who did them to you?
____ I reported no experiences
____ Female only
____ Male only
____ Both females and males

10. Have you ever been raped? Yes ____ No _____

Appendix C: U.S. Adult Food Security Survey Module

HH1. Which of these statements best describes the food eaten in your household in the last 12 months:
[1] Enough of the kinds of food we want to eat
[2] Enough but not always the kinds of food we want
[3] Sometimes not enough to eat
[4] Often not enough to eat
[ ] DK or Refused

Below are several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for you in the last 12 months.

HH2. The first statement is "I worried whether my food would run out before I got money to buy more." Was that often true, sometimes true, or never true for you in the last 12 months?
[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

HH3. "The food that 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?
[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

HH4. "I couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months?
[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

If affirmative response (i.e., "often true" or "sometimes true") to one or more of Questions HH2-HH4, OR, response [3] or [4] to question HH1, then continue. If not, skip to the next measure.

AD1. In the last 12 months, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?
[ ] Yes
[ ] No (Skip AD1a)
[ ] DK (Skip AD1a)

AD1a. [IF YES ABOVE] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

[ ] Almost every month
[ ] Some months but not every month
[ ] Only 1 or 2 months
[ ] DK

AD2. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?
[ ] Yes
[ ] No
[ ] DK

AD3. In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?
[ ] Yes
[ ] No
[ ] DK

AD4. In the last 12 months, did you lose weight because there wasn't enough money for food?
[ ] Yes
[ ] No
[ ] DK

If affirmative response to one or more of questions AD1 through AD4, then continue. If not, skip to the next measure.

AD5. In the last 12 months, did you ever not eat for a whole day because there wasn't enough money for food?
[ ] Yes
[ ] No (Skip AD5a)
[ ] DK (Skip AD5a)

AD5a. [IF YES ABOVE] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
[ ] Almost every month
[ ] Some months but not every month
[ ] Only 1 or 2 months
[ ] DK

Appendix D: Survey of Income and Program Participation (SIPP) – Housing Insecurity Items of the Adult Well-Being Topical Module.

The following are some of the specific difficulties people experience with household expenses.

1. Was there any time in the past 12 months when you did not pay the full amount of the rent or mortgage?
(1) Yes
(2) No

2. In the past 12 months were you evicted from your home or apartment for not paying the rent or mortgage?
(1) Yes
(2) No

3. How about not paying the full amount of the gas, oil, or electricity bills? Was there a time in the past 12 months when that happened to you?
(1) Yes
(2) No

4. In the past 12 months did the gas or electric company turn off service, or the oil company not deliver oil?
(1) Yes
(2) No

Appendix E: Mayer & Jencks' (1998) Medical Care Hardship Items.

1. Are you covered by health insurances such as Medicare, Medicaid, Veteran's benefits, Blue Cross, Prudential, an HMO, or any other program?
   [] Yes
   [] No

2. Has there been any time in the last year when you needed to see a doctor or go to the hospital but didn't go?
   [] Yes
   [] No
   If yes, go to 2a.

   a. Was that because of:
      [] Lack of money
      [] Lack of time
      [] I didn't know who to see
      [] Another reason

3. Has there been any time in the last year when you needed to see a dentist but didn't go?
   [] Yes
   [] No
   If yes, go to 3a.

   a. Was that because of:
      [] Lack of money
      [] Lack of time
      [] I didn't know who to see
      [] Another reason

Appendix F: Center for Epidemiological Studies Depression Scale Revised (CESD-R).

Below is a list of the ways you might have felt or behaved. Please check the boxes to tell me how often you have felt this way in the past week or so.	LAST WEEK				
	Not at all *or* Less than 1 day	1-2 days	3-4 days	5-7 days	Nearly every day for 2 weeks
My appetite was poor.	☐	☐	☐	☐	☐
I could not shake off the blues.	☐	☐	☐	☐	☐
I had trouble keeping my mind on what I was doing.	☐	☐	☐	☐	☐
I felt depressed.	☐	☐	☐	☐	☐
My sleep was restless.	☐	☐	☐	☐	☐
I felt sad.	☐	☐	☐	☐	☐
I could not get going.	☐	☐	☐	☐	☐
Nothing made me happy.	☐	☐	☐	☐	☐
I felt like a bad person.	☐	☐	☐	☐	☐
I lost interest in my usual activities.	☐	☐	☐	☐	☐
I slept much more than usual.	☐	☐	☐	☐	☐
I felt like I was moving too slowly.	☐	☐	☐	☐	☐
I felt fidgety.	☐	☐	☐	☐	☐
I wished I were dead.	☐	☐	☐	☐	☐
I wanted to hurt myself.	☐	☐	☐	☐	☐
I was tired all the time.	☐	☐	☐	☐	☐
I did not like myself.	☐	☐	☐	☐	☐
I lost a lot of weight without trying to.	☐	☐	☐	☐	☐
I had a lot of trouble getting to sleep.	☐	☐	☐	☐	☐
I could not focus on the important things.	☐	☐	☐	☐	☐

Appendix G: Alcohol Use Disorders Identification Test (AUDIT).

Place an X in one box that best describes your answer to each question.

Questions	0	1	2	3	4
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
5. How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
8. How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
9. Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year

Appendix H: Drug Use Disorders Identification Test (DUDIT).

Here are a few questions about drugs. Please answer as correctly and honestly as possible by indicating which answer is right for you.

1. How often do you use drugs other than alcohol? (See list of drugs on back side.)	Never ☐	Once a month or less often ☐	2-4 times a month ☐	2-3 times a week ☐	4 times a week or more often ☐
2. Do you use more than one type of drug on the same occasion?	Never ☐	Once a month or less often ☐	2-4 times a month ☐	2-3 times a week ☐	4 times a week or more often ☐
3. How many times do you take drugs on a typical day when you use drugs?	0 ☐	1-2 ☐	3-4 ☐	5-6 ☐	7 or more ☐
4. How often are you influenced heavily by drugs?	Never ☐	Less often than once a month ☐	Every month ☐	Every week ☐	Daily or almost every day ☐
5. Over the past year, have you felt that your longing for drugs was so strong that you could not resist it?	Never ☐	Less often than once a month ☐	Every month ☐	Every week ☐	Daily or almost every day ☐
6. Has it happened, over the past year, that you have not been able to stop taking drugs once you started?	Never ☐	Less often than once a month ☐	Every month ☐	Every week ☐	Daily or almost every day ☐
7. How often over the past year have you taken drugs and then neglected to do something you should have done?	Never ☐	Less often than once a month ☐	Every month ☐	Every week ☐	Daily or almost every day ☐
8. How often over the past year have you needed to take a drug the morning after heavy drug use the day before?	Never ☐	Less often than once a month ☐	Every month ☐	Every week ☐	Daily or almost every day ☐
9. How often over the past year have you had guilt feelings or a bad conscience because you used drugs?	Never ☐	Less often than once a month ☐	Every month ☐	Every week ☐	Daily or almost every day ☐
10. Have you or anyone else been hurt (mentally or physically) because you used drugs?		No ☐	Yes, but not over the past year ☐		Yes, over the past year ☐
11. Has a relative or a friend, a doctor or a nurse, or anyone else, been worried about your drug use or said to you that you should stop using drugs?		No ☐	Yes, but not over the past year ☐		Yes, over the past year ☐

Appendix I: Posttraumatic Stress Disorder Checklist for the DSM-5 (PCL-5).

Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

In the past month, how much were you bothered by:	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2. Repeated, disturbing dreams of the stressful experience?	0	1	2	3	4
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0	1	2	3	4
4. Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	0	1	2	3	4
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	0	1	2	3	4
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8. Trouble remembering important parts of the stressful experience?	0	1	2	3	4
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	0	1	2	3	4
10. Blaming yourself or someone else for the stressful experience or what happened after it?	0	1	2	3	4
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0	1	2	3	4
12. Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13. Feeling distant or cut off from other people?	0	1	2	3	4
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15. Irritable behavior, angry outbursts, or acting aggressively?	0	1	2	3	4
16. Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17. Being "superalert" or watchful or on guard?	0	1	2	3	4
18. Feeling jumpy or easily startled?	0	1	2	3	4
19. Having difficulty concentrating?	0	1	2	3	4
20. Trouble falling or staying asleep?	0	1	2	3	4

Appendix J: Flourishing Scale.

Below are eight statements with which you may agree or disagree. Using the 1–7 scale below, indicate your agreement with each item by indicating that response for each statement.

7. Strongly agree
6. Agree
5. Slightly agree
4. Mixed or neither agree nor disagree
3. Slightly disagree
2. Disagree
1. Strongly disagree

___ I lead a purposeful and meaningful life
___ My social relationships are supportive and rewarding
___ I am engaged and interested in my daily activities
___ I actively contribute to the happiness and well-being of others
___ I am competent and capable in the activities that are important to me
___ I am a good person and live a good life
___ I am optimistic about my future
___ People respect me