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RACISM, HEALTHCARE PROVIDER TRUST, AND MEDICATION ADHERENCE
AMONG BLACK PATIENTS IN SAFETY-NET PRIMARY CARE: A STRENGTH-BASED
APPROACH

A thesis submitted in fulfillment of the requirements for the degree of Master of Science at
Virginia Commonwealth University

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Abstract

Integrated primary care has been incorporated into a variety of healthcare settings. The benefits of these services are empirically supported by a plethora of studies, which highlight the integration of behavioral and physical healthcare to be beneficial for both patient and healthcare providers. Integrated care models are typically incorporated in Veterans Affairs hospitals, general primary care facilities, and community clinics. Community-based clinics, such as safety-net clinics, typically serve underrepresented populations, and research has shown several mental and physical health disparities to exist among minority populations. Further, the minority stress model posits that distal and proximal minority-based stress processes can result in a cascade of negative health outcomes, such as increased symptomology or poor health-management behaviors. Although minority stressors can lead to this series of consequences, several community and personal strengths may serve as protective factors for marginalized individuals. These processes may occur within safety-net primary care, considering that the populations of interest are underserved. Black patient populations face numerous barriers to healthcare, such as racism, discrimination, and provider bias. Prior literature has shown that prior experiences of racism result in poorer mental and physical health outcomes for Black patient populations. Further, these outcomes have been shown to negatively impact healthcare attitudes and behaviors. The current study aimed to examine how aspects of the minority stress model may operate within safety-net primary care services for Black patient populations. It was hypothesized that racism would predict poorer mental health, which would negatively impact provider trust, and therefore predict lower medication adherence. Using a strengths-based approach, grit and social support were hypothesized to serve as personal and collective buffers to this series of relationship. A path analysis showed that racism significantly predicted mental health, which predicted poorer provider trust; however, the last path of this model, provider trust

to medication adherence, was not found to be statistically significant. Thus, the path analysis was broken up into a series of mediations, which explored the relationship between racism and both provider trust and medication adherence through mental health. Mental health was found to mediate the relationship from racism to provider trust and from racism to medication adherence. The moderated mediation effect of social support was found to be non-significant for all mediations, except that grit was moderated the mediation between racism to medication adherence through mental health. These results showed grit served as a personal strength to dampen the associated effects of racism, which may suggest improving intrinsic attitudes and motivation towards long-term health related goals may increase treatment adherence behaviors. Results from this study also confirm the importance of integrated primary care services, as the data suggested high rates of mental health problems, which typically go underreported among Black patients in healthcare settings.

Racism, Healthcare Provider Trust, and Medication Adherence among Black Patients in Safety-Net Primary Care: A Strength-Based Approach

Overview of Literature Review

This literature review will begin by discussing the nature of safety-net primary care medicine for Black patients. Then, the literature review will highlight barriers to treatment, such as healthcare provider trust and medication adherence. Although these phenomena can present in all primary care cases, there are several unique factors that may predict these processes within Black populations. Namely, healthcare provider trust may be influenced by prior instances of discrimination. Black patients frequently report poor treatment and healthcare provider mistrust, due to perceived cultural insensitivity of healthcare providers. The next section of the literature review will explain the relationship between prior experiences of racism and healthcare provider trust, in primary care psychology. Next, the review will present the minority stress model, which proposes that poorer health outcomes are directly associated with minority identity status. In this study, the specific outcomes are healthcare provider mistrust and medication adherence. The review will then introduce experienced racism as a predictor of the identified outcomes in the model. This will be followed by the explanation of certain psychological variables (e.g., depression, anxiety, and hostility) that may account for the proposed relationship between experienced racism and healthcare provider trust. The next portion of the literature review will introduce personal and collective strengths that may qualify this proposed relationship, such as grit and social support. The literature review will conclude with proposing the current study, hypothesis, and data analytic plan.

Primary Care and Integrated Care

Primary care programs across the United States vary in services offered, training modality, therapeutic orientation style, and population served. Co-located care is a subdomain of primary care, which locates behavioral health and medical services within the same office. Furthermore, co-located care facilities share administrative staff and offers referral services for patients seeking medical resources. Coordinated care refers to healthcare facilities that exchange patient information between medical and behavioral health providers. The adaptation of integrated care, which describes the incorporation of behavioral health services in primary care settings, has grown profusely in recent years (Blount, 2003). Treatment plans consist of behavioral and medical elements, as opposed to separate treatment plans.

The US federal government implemented a large-scale initiative which called for the integration of physical and behavioral health within primary care facilities, through the Department of Veteran Affairs (VA) healthcare systems (Post, Metzger, Dumas, Lehmann, 2010). The rationale behind this project was to meet the needs communicated by patients and healthcare providers, which showed mental health conditions to be of primary concern following physical pain or injury. The roles of health professionals in integrated healthcare systems vastly vary. For example, healthcare providers in integrated care health services are adopting holistic medical perspectives, which call for a team of behavioral health professionals. Thus, the growing demand of psychologists is evidence of the need for mental health-based interventions in primary care settings (Bluestein & Cubic, 2009). Moreover, healthcare providers rarely receive advanced training to address issues regarding behavioral health concerns, but a majority of patients present in primary care in need of mental health services (Grenier, Chomienne, Gaboury, Ritchie, &

Hogg, 2008). Robinson and Stosahl (2009) concluded that psychologists are currently playing an integral role in integrated primary care, which demonstrates its importance and utility.

Integrated primary care services are provided through a variety of medical settings including VAs, hospitals, community clinics, and safety net clinics. Among the different facilities this model is housed under, format of supervision, the use of evidenced based treatment, collaboration among staff, and team-based mental health treatment are similarly structured (Leung et al., 2018; Rybarczyk, Stewart, Perrin, & Radcliff, 2017). Despite sharing features, the efficacy of integrated primary care facilities ranges based on a collection of factors, such as targeted vs. non-targeted programs, or specified vs. unspecified treatment modalities. Targeted programs, which are aimed at specific populations, serve as opportunities to meet the needs of a specific group, while also collecting data for research purposes on those specific populations. Training programs similarly incorporate a research base, since they emphasize evidence-based training model and empirically report patient outcomes (Blount, 2003). Although the differences in training models have been shown to affect treatment outcomes, assessing the utility of integrated primary care services should always consider the target patient population.

With the shift of medical models impacting both insurance companies and federal government spending, healthcare providers have faced several setbacks, despite the proposed benefits. For example, The Milliman Report (Melek, Norris, & Paulus, 2014) described the move towards physical and behavioral integrated care provides an opportunity for medical savings; however, these benefits come at a cost. Since the general shift into integrated primary care, there is an increased workforce demand for trained psychologists, but a reported shortage of properly trained clinicians (Hall et al., 2015; O'Donohue & Maragakis, 2015). Despite the previously

mentioned limitations, therapy in integrated care has been robustly shown to be more beneficial than detrimental to patients.

Despite the mentioned limitations, integrated care has several benefits concerning both healthcare administration and patient outcomes. Task delegation may relieve healthcare provider burden and incorporate holistic treatment plans. Additionally, health professionals typically see a diverse patient population and a variety of health presentations. Working collaboratively on an integrated healthcare team may be more beneficial to patients as compared to specialized clinics or emergency departments. Primary care is aimed to provide empirically-validated care, while also referring patients needing specialized care (e.g., psychosis) to appropriate treatment facilities (Leung et al., 2018). Behavioral health management is essential for primary care clinics, because patients often present with mental health concerns (Kroenke & Mangelsdorff, 1989). Patients who received therapy in an integrated care setting reported less depression and anxiety symptoms compared to patients in clinics without integrated care (Sadock, Perrin, Grinnell, Rybarczyk, & Auerbach, 2017). In another study, pediatric patients receiving primary care treatment reported less anxiety and depression when compared to those who were discharged to outpatient facilities (Weersing et al., 2017). Katon and colleagues (1995) found a significant decrease in reported depression symptoms within a sample of primary care patients meeting criteria for major depressive disorder who received psychology services. Moreover, these results showed therapy to effectively decrease symptoms for individuals with severe depression, although the findings were not consistent for patients with mild to moderate depression. Evidence suggests there are benefits associated with the integrated primary care model, but research has also shown these results are inconsistent based factors such as facility type, targeted vs. non-targeted treatment, clinical training, and patient population (Blount, 2003).

Integrated Primary Care in Safety Net Settings

Integrated primary care is an integral service in safety net settings, which are defined as a system which provides free health services for low-income and underserved patients (The Association of State and Territorial Health Officials [ASTHO], 2009). Clinics in safety net settings often receive federal, state, private, nonprofit, or university funding in order to offer medical or mental health services to uninsured or economically disadvantaged groups (Darnell, 2010). Safety net clinics yield several benefits for both the patient and provider. Often, underserved communities are unable to receive appropriate care, due to limited-to-no insurance coverage, lack of English proficiency, homelessness, or identifying as a racial or ethnic minority, and these clinics provide inclusive health services for these marginalized groups (ASTHO, 2009). Additionally, safety net clinics have been referred to as the “one stop shop” for underserved communities which allows patients to receive mental health services and dental care, all in one central location. It was reported that there is a growing need for integrated primary care specialists, but a shortage of training opportunities (Post et al., 2010). Thus, an additional benefit of safety net clinics is that they offer unique and needed training opportunities for medical students and early career professionals. Although these facilities are advantageous for all parties, there are several drawbacks. Namely, homeless individuals frequently report intertwined mental and behavioral health issues to a greater degree than non-homeless individuals which communicates the necessity of integrated primary care facilities in safety net settings. Although these clinics provide access for homeless individuals, this previously mentioned disparity is exacerbated by understaffed clinics (Rybarczyk et al., 2017; Leung et al., 2018). Clinicians in safety net settings may also lack the cultural sensitivity needed to administer appropriate care for racial or ethnic minorities. This patient population typically presents with

somaticized symptoms and has less awareness of current psychological functioning (Tylee & Walters, 2005; Aragonés, Labad, Pinol, Lucena, & Alonso, 2005). This lack of awareness by providers can lead to misdiagnosis and improper treatment, which may reinforce health disparities.

Primary care based behavioral health (PCBH) services offer several benefits for both patients and healthcare administrators. Overall, the integrated care model has been shown to increase access and utilization of behavioral health services in primary care and specialty mental healthcare facilities (Possemato et al., 2018). Several studies have demonstrated that patients enrolled in integrated care services experienced shorter wait times for services and were more likely to engage and attend a more sessions compared to patients who received specialty referrals (Bartels et al., 2004; Ayalon, Arian, Linkins, Lynch, & Estes, 2007; Krahn et al., 2006). Regarding referral follow-up, Wray, Szymanski, Kearny, and McCarthy (2012) found patients with a PCBH visit prior to a specialty mental health referral to be 1.37 times more likely to have attended a subsequent appointment, compared to those without a PCBH visit.

Despite the previously noted research that highlighted several limitations of the sensitivity to mental health needs in integrated care settings, research has shown significant improvements in depression and anxiety (e.g., Sadock et al., 2014), emotional lability, and alcohol/substance use, within community-based safety-net clinics (Beagly et al., 2008). Research has also shown more patients to present below clinical cutoff scores for mental health symptomology upon PCBH follow-up compared to the initial visit, which demonstrate the efficacy of integrated care services (Davis, Corrin-Pendry, & Savill, 2008). Patients that have completed 3 months' worth of treatment were found to present with decreased depression symptoms and increased reported quality of life (Kolbasovsky, Reich Romano, & Jamarillo,

2005). Among federally qualified health centers, patients who received behavioral activation interventions reported significant improvements in depression symptoms (Bridges et al., 2015), and overall improvements in psychological functioning were observed (Bridges et al., 2014). Thus, research extensively shows how integrated care is beneficial for patients, given decreased symptom presentation, increased accessibility, and frequent utilization, which may undermine some of the aforementioned barriers to treatment.

Alegría and colleagues (2008) found racial and ethnic minority groups less likely than non-Latino Whites to have access to mental health treatment. A nationally representative sample found 58.8% of Black individuals meeting criteria for depressive disorder within the past year to not receive mental health treatment which was found to significantly differ to non-Latino Whites (40.2%). Increased prevalence rates of mental health diagnoses along with a substantial number of individuals failing to receive treatment within safety net clinics are evidence of inadequate access to care, and these different barriers to treatment may be explained by a separate mechanism of systemic racism. Blacks are not a homogenous group, but share similar barriers to adequate healthcare, such as the somatization of mental health symptoms and reluctance to receive services based on anticipated limited ability of providers; further, many providers are unable to appropriately attend to these presentations (Ani et al., 2009; Alegría et al., 2008).

Previous literature suggests that Blacks experience discriminatory treatment in healthcare settings (Smedley, Stith, & Nelson, 2002). Blacks are more likely to experience racism as a chronic stressor, resulting in higher cortisol levels, which present as physical health complaints (Cuffee et al., 2013). Since symptoms typically present somatically, Black patients often seek integrated primary care services aiming to address issues related to their physical health while managing unassessed mental health difficulties. Physiological symptoms, such as chest pain,

fatigue, dizziness, headache, or back pain are typically reported, and these may co-occur or even mask mental health problems (Blount, 2003). Ashton and colleagues (2003) highlighted that depression and anxiety among Black populations are less likely to be detected in primary care settings compared to Whites. Additionally, previous literature has demonstrated that experiences with racism result in psychological complications (Pieterse, Todd, Neville, & Carter, 2012). As racism directly affects Blacks, it also threatens the relationship with healthcare providers. Prior literature has uncovered the relationship between perceived discrimination and trustworthiness of health care providers: there is a significant relationship between perceived racism and satisfaction with healthcare, through provider trust. Participants in this study reported neutral healthcare mistrust scores, which may be explained by under-reported symptoms due to social desirability (Benkert et al., 2006). Thus, racism's effects present in both interpersonal and institutional contexts, and one way Black patients display these effects can be through health provider mistrust.

In primary care settings, Black patients tend to report mental health concerns as secondary symptoms to physical symptoms (Cuffee et al., 2013). Anticipatory stress and anxiety may become salient for these individuals when receiving healthcare. Measuring healthcare provider trust directly related to race-based stressors has been conducted in a variety of studies (e.g., Vina et al., 2015; Williams, Clay, Ovalle, Atkinson, & Crowe, 2018); however, research has not yet examined whether mental health affects the relationship between experienced racism and healthcare provider trust. Although previous literature has assessed the direct relationship between experienced racism and healthcare provider trust, other mental health factors may account for this relationship. A meta-analysis conducted by Pieterse et al. (2012) revealed that discrimination and racism result in a variety of mental health issues. Apart from anticipatory

stress, which has been relevant within primary care contexts, depression, anxiety, perceived stress, and satisfaction with life have all been identified as consequences of racism. Additionally, Pieterse and colleagues' (2012) meta-analysis showed depression symptoms, along with other outcomes, to be related to perceived racism.

Certain mental health issues have been shown to be reduced when general life stressors are included in statistical models. For example, Ong, Fuller-Rowell, and Burrow (2009) found racial discrimination to have a significant effect on anxiety, negative affect, and depression. Daily discrimination and negative events did not mediate the relationship between chronic discrimination and anxiety and partially mediated the relationship between discrimination and negative affect. Furthermore, both daily discrimination and negative events mediated the relationship between chronic discrimination and depression. Researchers found stress proliferation, the mechanism that refers to stressors creating greater stress, to impact the magnitude of primary race-based stressors and secondary stressors associated with negative life stressors (Pearlin et al., 1997, 2005). Researchers concluded that some of the variability in the magnitude of psychological distress can be attributed to participants being exposed to similar stressors (i.e., racism or discrimination) possibly being exposed to different mechanisms of the stressor. For example, some participants may have been discriminated against through inadequate access to housing, whereas others may have been targets of race-based harassment. These data show that chronic discrimination predicts depression and anxiety when in part through daily discrimination and negative events. Pearlin and colleagues (2005) evaluated depression and anxiety as outcome variables, whereas Woods-Giscombe and Cobel (2008) assessed identity-related stress within Black women, and these data showed that gender and race-based stress are just as debilitating as general stress.

Associated Outcomes

Although integrated primary care facilities have been shown to effectively detect mental health symptoms, facilitate referral follow-throughs, and increase likelihood in returning for a follow-up appointment, healthcare disparities have been revealed for certain minority groups, which may present in primary care settings as well. For example, lesbian, gay, and bisexual Black women were found to report greater levels of distress when compared to heterosexual Black women (Matthews & Hughes, 2001; Mays, Cochran, & Roeder, 2003). Regarding disparities in perceived care, several studies have found Blacks to have higher rates of dissatisfaction with their healthcare providers which may influence healthcare attitudes within the Black community (Campbell, Ramsay, & Greene, 2001; LaVeist & Carroll, 2002; LaVeist & Nuru-Jeter, 2002). Carter and Forsyth (2010) concluded that Blacks are more likely to be apprehensive to attend treatment due to beliefs that friends, family, or loved ones are more equipped to handle racially-based trauma and distress, as compared to medical professionals. Additionally, participants reported that medical professionals often neglect to inquire about racial/ethnic identity and its relevance to presenting health issues. Thus, low levels of provider trust may be predicted by the aforementioned factors, some of which are a result of shared poor healthcare experiences. Further, these mechanisms may exist in primary care contexts.

It is suspected healthcare provider mistrust is common among Blacks in part because of perceived racism in the patient-provider relationship. Outside of integrated primary care facilities, Black patients reported that their racial mistrust/sensitivity was casted as “generalized worry” by culturally insensitive health providers (Freedman, 2003; Benkert, Pohl, & Coleman-Burns, 2004). Research shows that healthcare providers regard race as an important component of case-conceptualization, but their medical judgement can be influenced by race which related

to unattainable treatment plans (Glover, Sims, & Winters, 2017). Glover and colleagues (2017) also concluded that everyday discrimination, lifetime discrimination and unfair treatment in medical settings contribute to provider mistrust and dissatisfaction. Additionally, apart from racially charged medical decisions, Blacks often report that race-based factors were disregarded concerning treatment considerations. Another study identified health care system distrust to be related to instances of prior discrimination in the community (Chen & Yang, 2013). As racism directly affects Blacks in daily activities, it can manifest through poor relationships with healthcare providers.

Research suggests that patients receiving integrated care services in safety net settings often display positive outcomes in medication adherence and health practices (Robinson & Strosahl, 2009; Lanoye et al., 2016). However, medication adherence has been shown to be indirectly related to experienced racism and discrimination in the healthcare system (Cuffee et al., 2013). Previous literature has shown Black individuals to be less likely to follow treatment or preventative plans if they reported distrust in their provider, and higher reports of healthcare discrimination were associated with healthcare provider mistrust (O'Malley, 2004). Within a primary care-based sample of Blacks with hypertension, researchers found racial discrimination to predict lower medication adherence, and healthcare provider trust partially mediated this relationship (Cuffee et al., 2013). This study did not consider mental health in this series of relationships and examined a fairly specific patient sample with hypertension, as opposed to a general safety-net primary care patient sample with diverse presenting health concerns. Considering mental health, Black patients have been shown to prefer counseling to medication, and counseling outcomes are predicated upon provider trust (Sadock et al., 2017). Medication

adherence and treatment compliance have been shown to be associated with greater provider trust for Black patients (O'Malley, 2004).

Predictors of Healthcare Provider Mistrust

Due to the vast differences in how racism is assessed in psychology, and how these differences may contribute to variability in health outcomes, the different ways it has been operationalized will be discussed. Racism has been operationally studied through three primary mechanisms, interpersonal, institutional, and structural (National Research Council, 2004). Both types of racial discrimination contribute to Blacks' health conditions. Interpersonal racism can be described as behaviors, actions, or words that are usually visible and directly target racial/ethnic minorities. Institutionalized racism is often indirect discrimination toward people of color which results in White systemic power (National Research Council, 2004). Structural racism refers to the collection of systems that consistently perpetuate White privilege across institutions (Vaught & Castagno, 2008). Feagin (2009) proposed that White individuals attain power through accumulating resources and controlling the dispersion of these resources, while deliberately or inadvertently discriminating against racial/ethnic minorities. Given racism's multileveled structure, it directly and systemically affects people of color. Interpersonal racism may result in anxiety and anticipatory stress, whereas institutional racism typically enforces mechanisms that threaten equity. For example, someone experiencing racist remarks or actions may become more anxious about racially charged situations. People of color experiencing systemic racism may face greater barriers while acquiring resources, solely due to their racial/ethnic identity. Soto and colleagues (2011) assessed the relationship between racial discrimination and anxiety symptoms, and more than 40% of participants endorsed having experienced racial discrimination. Some measures used to examine previous experiences of racism may assess experiences directly

related to interpersonal prejudice and discrimination, rather than institutionally crafted occurrences. Thus, both of these mechanisms can result in variability in conceptualization of health condition among Black individuals, but the current paper will focus on experienced racism at the individual level.

As previously mentioned, racial and ethnic minorities tend to present within primary care safety net clinics with an array of mental health difficulties (Sadock et al., 2017). Regarding anxiety, more experiences of racism are associated with higher levels of anxiety. Instances of discrimination can result in physiological reactions similar to panic attacks or posttraumatic stress (e.g. hypervigilance and anxiety; Carter & Forsyth, 2010). Research has demonstrated racial discrimination to be not as strong of a predictor of anxiety as racial harassment. Researchers concluded the variation in predictability can be due to the direct effects of interpersonal harassment as compared to the passivity of discrimination. In other words, individuals are more aware of racially charged negative comments direct towards them, opposed to institutional exclusion or rejection associated with racial discrimination. Experiences with racism affect individual's psychological well-being and interpersonal behaviors. Namely, experienced racism was shown to predict higher levels of hostility or racially charged harassment (Carter & Forsyth, 2010).

The effects of experienced racism on psychological well-being has been well documented in research. Several studies concluded perceived racism and discrimination to predict higher depression and anxiety symptoms (Broman et al., 2000; Greer, 2011; Landrine & Klonoff, 1996; Schulz, Gravelle, Williams, Israel, Mentz, & Rowe, 1996). One study found that Black women diagnosed with depression endorsed greater levels of distress compared to European American women with similar diagnoses (Myers et al., 2002). Additionally, research has shown Blacks to

report higher levels of anxiety than their White, socioeconomically matched counterparts (Sadock et al., 2017). Breslau and colleagues (2006) identified a 24.7% lifetime prevalence rate of anxiety within Black populations, while also revealing that anxiety symptoms were more common among Blacks compared to other racial and ethnic minority groups. Additionally, research has shown racism-related stress to predict psychological distress in Blacks, when controlling for general-life stress (Pieterse & Carter, 2007). Blacks have been shown to report greater distress when compared to other racial and ethnic minority groups. Previous literature identified psychological variables (e.g. depression, anxiety, hostility, hypervigilance) as outcomes to experienced racism. In conclusion, previous literature identified experienced racism to associate with depression and anxiety within Black patient populations. However, research has yet to explore if the previously mentioned psychological responses must be present in order to predict healthcare provider trust. Thus, the current study will assess if depression and anxiety mediate the relationship between experienced racism and healthcare provider trust.

Personal and Collective Buffers to Experienced Racism

Despite the negative outcomes associated with experienced racism, there may be collective protective factors individuals in underserved communities possess which can buffer experienced racism's outcomes. Grit refers to the perseverance and passion for long-term fortitude, despite failure, adversity, and plateaus in progress (Duckworth, Peterson, Matthews, & Kelly, 2007). It is typically assessed in educational contexts and has been shown to significantly predict higher education achievement more than other personality factors, such as conscientiousness. Previous literature has described grit as an internal process of sustained stamina over time which is conceptually different from daily skill-building decisions (Duckworth et al., 2007). Individuals who possess high levels of grit tend to pursue long-term goals despite

failing to receive positive feedback (Duckworth et al., 2007). However, research regarding this mechanism in primary care contexts is sparse. Grit may present as perseverance towards health-related treatment goals which could manifest in positive health behaviors, such as medication adherence. Research has shown higher levels of grit to predict increased aspects of physical and psychological health-related quality of life and healthcare management skills (Sharkey et al., 2017). However, the previous study's sample comprised of predominately adolescent and young adult participants, majority of whom identify as White and women. Thus, it is unclear if a similar trend occurs in Black patient populations. McGee and Stovall (2015) suggested that Blacks develop grit as a coping strategy to deal with discrimination. This trend may manifest as a personal strength, which may buffer the effects of experienced racism and mental health issues among Black populations. Thus, participants in the current study with higher levels of grit may be exhibiting positive coping behaviors, and the known effects of grit may operate stronger among this particular population. The current study will assess if grit qualifies the proposed direct and indirect relationships associated with racism, mental health conditions, and healthcare provider trust. Community and social support may be another strength that may buffer the effects of experienced racism. Social support measures assess quantity (i.e., how much social support) and quality (i.e., satisfaction with social support) of perceived social support, and has been shown to positively affect health-related stress (Williams, Clay, Ovalle, Atkinson, & Crowe, 2017). Previous literature has shown poor social support to be associated with high symptom severity and unemployment among individuals meeting criteria for depression and anxiety (Prins et al., 2011). In a sample of Black patients diagnosed with Type 2 Diabetes, higher health-related distress was partially attributed to less satisfaction with social support, and these data suggest enhancing social support may improve resilience among racial/ethnic minorities with chronic

health conditions (Williams et al., 2018). Foundational intervention-based literature has suggested that social support functions as a buffer to the detrimental effects of health conditions among patient populations (House, Umberson, Landis, 1988; Cohen & Willis, 1985). Thus, the current study will assess if social support buffers the effects of experienced racism and healthcare provider trust.

Minority Stress Model and the Current Study

The minority stress model (Meyer, 2003) is a theoretical framework intended to explain the mental health risks of minority communities and serves as a model for a variety of minority populations (Meyer, Schwartz, & Frost, 2008). The minority stress model may be applicable to the experiences of Black patients seeking and following through with healthcare. Within the model, minority status and minority identity lead to distal minority stress processes (e.g., discrimination) and proximal minority stress processes (e.g., expectations of rejection), and these lead to reduced mental health outcomes. Further, within this model, the effects of minority stress processes on mental health are moderated by coping and social support. Despite research supporting a number of the connections in the minority stress model, research exploring the relationship between experiences with racial/ethnic discrimination, mental health, healthcare provider trust, and medication adherence has not been conducted. Thus, the proposed study seeks

to identify relationships among these variables, and Figure 1 maps the current study's variables onto the respective components of the minority stress model.

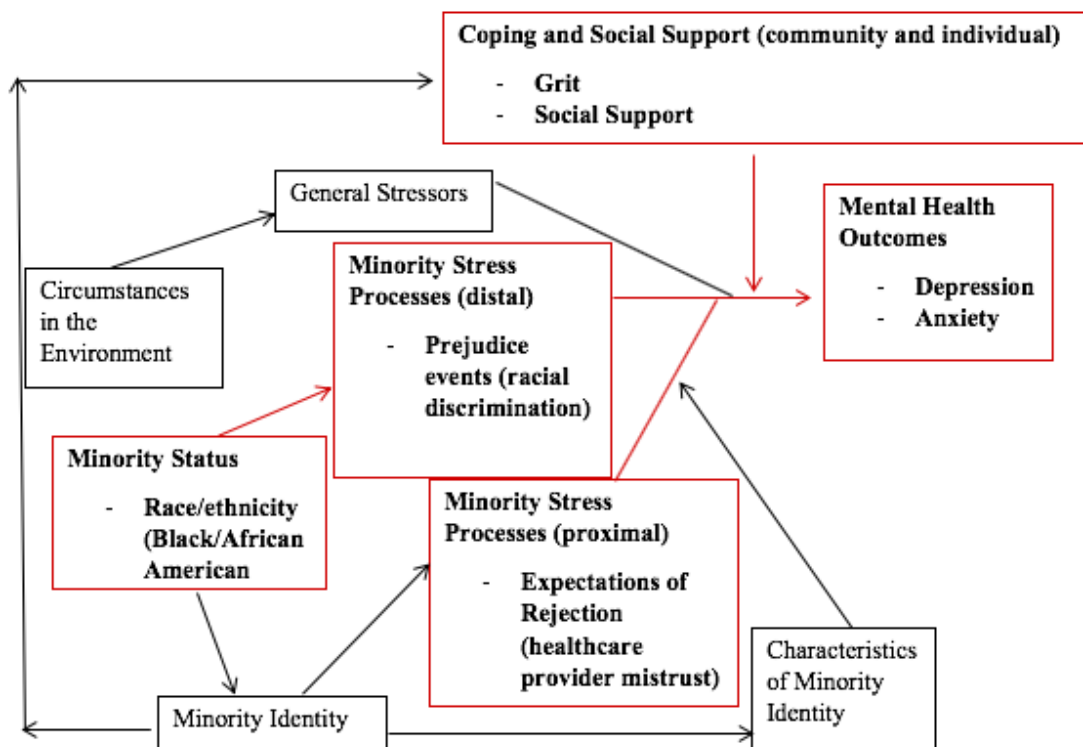


Figure 1. The minority stress model (Meyer, 2003) adapted to address the proposed relationships among experienced racism, depression, anxiety, healthcare provider mistrust, and medication adherence. *Note.* Boxes in red represent the current study's constructs superimposed onto the minority stress model.

Research has extensively shown that racial discrimination is associated with less healthcare provider trust (Cuffee et al., 2013; Williams et al., 2018; Glover et al., 2017; Benkert et al., 2006). The minority stress model posits that poorer mental health may be elicited by prior experiences of racism. Concerning the current study, healthcare provider mistrust and medication adherence are primary outcomes that may be affected by experienced racism. Mediating factors of experienced racism and associated outcomes have been extensively explored, but mental health conditions, such as depression and anxiety have not. Research has shown healthcare provider mistrust to be associated with a variety of potentially harmful behaviors, such as poor

treatment adherence (Benkert et al., 2006; Chen & Yang, 2013; Rybarczyk et al., 2017). Previous research has shown depression to significantly associate with medication nonadherence among patients diagnosed with coronary heart disease, after adjusting for age, ethnicity, education, social support, and heart disease severity (Gehy, Haas, Pipkin, & Whooley, 2005). Bauer and colleagues (2012) demonstrated a decrease in reported anxiety symptoms to significantly predict improved medication adherence behaviors within a cardiology outpatient sample. The current study's sample consists of primary care patients in a safety-net clinic. As previously mentioned, these clinics serve low-income communities and patients in these settings predominately experience homelessness and/or inadequate housing. Among this particular population, the link between homelessness/housing inequality, mental and physical health, and positive health-care behaviors (including medication adherence) has been explored in research. Krieger and Higgins (2002) and Dunn (2000) have shown adequate housing to improve mental and physical health functioning, which improves medication adherence and positive health behaviors (Kidder, Wolitsky, Campsmith, & Nakamura, 2007). The current study proposes that experienced racism may predict reduced mental health, which leads to healthcare provider mistrust and finally to poor medication adherence. Although the minority stress model supposes that minority identity status predicts poorer health outcomes, prior literature has identified personal and collective strengths that may reduce the severity of the manifestation of discrimination. This model aims to identify grit and social support to serve as protective factors of anticipated outcomes of discrimination.

The purpose of the current study is to assess whether depression and anxiety account for the relationship between experienced racism and healthcare provider trust. Prior research conducted by Cuffee and colleagues (2013) assessed the relationship between racial

discrimination and medication adherence, through healthcare provider trust. These data showed that healthcare provider trust partially mediated the association between racial discrimination and medication adherence; however, this particular model did not account for mental health issues, a key feature of the minority stress model. The minority stress model conceptualizes that a series of minority stressors (e.g., proximal and distal processes) would lead to poorer mental health. For the purposes of the current study, mental health is considered as an immediate outcome of experienced racism which places it earlier in the model and healthcare provider trust is theorized to operate later in the model. The justification of this shift is supported by a variety of research that has shown mental health and healthcare provider trust to serve as associated outcomes of experienced racism. The current study's adaptation of the minority stress model posits that experiences of racism are associated with lower mental health, healthcare provider trust, and then lower medication adherence. A meta-analysis conducted by Pieterse et al. (2012) shows that depression and anxiety are often clustered together in analyses. Additionally, few studies included in the meta-analysis utilized validated depression and anxiety measures, which may have threatened external validity. Prior research has revealed that experienced racism predicts general mistrust in healthcare providers and healthcare systems (Ben, Cormack, Harris, & Paradies, 2017). However, the established literature has yet to evaluate whether mental health plays a role in healthcare provider mistrust. Therefore, the current study aims to investigate known health disparities related to medication adherence behaviors potentially as a result of healthcare provider mistrust. Although it is imperative to identify disparities in treatment adherence behaviors, there may be protective factors associated with the proposed relationship that may buffer the associations among experienced racism, depression and anxiety, healthcare provider trust, and medication adherence. Several personal and collective strengths have been

identified to serve as a buffer for outcomes associated with racism (Graham et al., 2012). Grit and social support, examples of these strengths, are hypothesized to buffer the direct and indirect relationship among these other variables in the model.

Method

Participants

The current study will be a secondary data analysis using data collected from participants at a safety-net primary care facility. Participants were required to be 18 years of age or older and to be currently receiving primary care services at the clinic. A sample of 134 Black participants were included in the study, which consisted of 76 men and 58 women. Ages ranged from 22 to 61 ($M = 45.39$; $SD = 11.00$). Regarding health insurance status, 54.5% of participants were covered and 45.5 percent of participants were not. However, it is important to note that many or most of the participants reporting health insurance had the state's indigent care insurance. Highest educational levels achieved are as follows: 9.0% had a middle school/junior high-level education, 57.5% high school, 22.4% some community college (no degree), 3.7% 2-year technical degree, 6.0% 4-year college degree, and .7% master's degree.

Measures

Experienced racism. Participants reported their experienced racism by responding to three questions assessing harassment from the Daily Life Events (DLE) subscale of the Racism and Life Experiences Scale (RaLes; Harrell, 1997) which were: How often have you... "been treated rudely or disrespectfully because of your race," "been insulted called a name, or harassed because of your race," and "been laughed at, made fun of, or taunted because of your race." Participants rated how often these events occurred, which included never, less than once a year, a few times a year, about once a month, a few times a month, and once a week or more, which

were then added together to create a total score. This scale has been utilized across a collection of populations, including low-income, Black populations. For the current study, the questions assessing experienced racism was found to have strong internal consistency ($\alpha = .88$).

Depression. The Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) is a 9-item self-report scale that measures depressive symptoms. Respondents indicate the frequency with which each item has bothered them over the prior two weeks (e.g., “Little interest or pleasure in doing things”) using a scale from 0 (Not at all) to 3 (Nearly every day). Total scores range from 0-27, with higher scores indicating greater depressive symptomology (0-4 = none, 5-9 = mild, 10-14 = moderate, 15-19 = moderately severe, 20-27 = severe depressive symptoms). Previous literature has found the PHQ-9 to have excellent internal reliability within a primary care setting ($\alpha = .89$; Kroenke et al., 2001). The PHQ-9 has been utilized in Black primary care patient populations (Huang, Chung, Kroenke, Delucci, & Spitzer, 2006). The reliability of the PHQ-9 for the current study was $\alpha = .88$.

Anxiety. The Generalized Anxiety Disorder Scale (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006) is a 7-item self-report scale that measures anxiety symptoms. Respondents indicate the extent each item has bothered them over the past two weeks (e.g., “Feeling nervous, anxious, or on edge”) using a scale from 0 (Not at all) to 3 (Nearly every day). Total scores range from 0-21, with higher scores indicating greater anxiety symptomology (0-4 = none, 5-9 = mild, 10-14 = moderately severe, 15 or greater = severe). Previous literature has found the GAD-7 to have strong internal consistency ($\alpha = .93$; Spitzer et al., 2006). Previous research regarding the psychometric properties and utilization of the GAD-7 among Black patient populations is sparse. However, for the current study, the GAD-7 had excellent internal consistency ($\alpha = .93$).

Grit. The Short Grit Scale (Grit-S; Duckworth & Quinn, 2009) was used to assess level of grit. The self-report measure consists of several sub-factors of grit, relating to consistency of interests and perseverance of effort and is adapted from the original Grit Scale (Duckworth et al., 2007). High scores on this measure indicate higher levels of grit. Previous literature has found the Grit-S Scale measure to have adequate range of internal consistency for the total scale ($\alpha = .73$ to $.83$) and the Consistency of Interests subscale ($\alpha = .73$ to $.79$), but poorer range in reliability for the Perseverance of Effort subscale ($\alpha = .60$ to $.78$; Duckworth & Quinn, 2009). For the current study, the Grit-S Scale was used in order to assess patients' grit level outside of academic contexts. Participants responded to questions such as "new ideas and projects sometimes distract me from previous ones" and "setbacks don't discourage me." Grit has minimally been explored among Black populations. Specifically, Strayhorn (2013) has assessed grit in a Black college student population and found it to significantly predict higher academic achievement. In connection with previous research, grit among Black populations may present as fortitude towards health-related goals, despite socially-derived setbacks (i.e., racism). For the current study, the Perseverance of Effort subscale demonstrated poor internal consistency ($\alpha = .60$) and the Consistency of Interest subscale showed adequate internal consistency ($\alpha = .81$).

Social support. The Interpersonal Support Evaluation List (ISEL; Cohen & Hoberman, 1983) assesses four aspects of perceived social support: tangible, appraisal, belonging and self-esteem support. The current study used a 12-item form of this assessment, developed by Cohen, Mermelstein, Kamarck, & Hoberman (1985), which consisted assessed tangible, belonging, and appraisal support. All items are totaled to yield a total score, with higher scores reflecting greater perceived social support. The total scores for the ISEL-12 (Cohen et al., 1985) was shown to have adequate internal consistency ($\alpha = .70$; Merz et al., 2015). The ISEL has minimally been

used among low-income Black patient populations. Previous literature has shown discrepant findings outcomes while accounting for social support in statistical models, thus demonstrating the need for future validation of the ISEL (Kendzor et al., 2009; Brown and Gary 1987; Husaini et al., 1991). For the current study, the ISEL total score was found to have strong internal consistency ($\alpha = .81$).

Healthcare provider trust. The Interpersonal Physician Trust Scale (IPTS; Hall et al., 2002) is a 10-item scale, used to assess three dimensions of physician trust: fidelity, competence, and honesty. The original measure was adapted to assess participants' trust in their "healthcare provider," rather than "physician" to be more inclusive of the various types of healthcare providers encountered in primary care. Higher scores on this measure indicate participants' greater reported trust in their healthcare provider. Prior research has shown this scale to have strong internal reliability among a nationally representative sample ($\alpha = .93$; Hall et al., 2002). Further, among a low-income Black patient population, the IPTS was shown to have strong internal consistency (Blackstock, Addison, Brennan, Alao; $\alpha = .93$). For the current study, the internal consistency was found to be adequate ($\alpha = .83$).

Medication Adherence. The Medication Adherence Questionnaire (MAQ; Morisky et al., 1986) is a 4-item self-report measure that assess participants' medication adherence behaviors. Participants endorse either a 0 (yes) or 1 (no), and scores are summed to create a total score. Prior literature has shown the MAQ to have adequate internal consistency ($\alpha = .76$; Thompson Kulkarni, & Sergejew, 1999). The MAQ has been shown to be an adequate measure of medication adherence among African American populations (Morisky, Greene, & Devine, 1986; Erickson, Coombs, Kirking, & Azimi, 2001; Ogedegbe et al., 2007). For the current study, the MAQ was found to have adequate Internal consistency for a 4-item scale ($\alpha = .67$).

Procedure

Participants were recruited from the waiting area of a safety-net primary care clinic prior to or after being seen for their medical appointment. Patients completed paper surveys during the wait for their medical appointment but were required to stop if called for their appointment, so health services were not interrupted. In situations where participants were called back for an appointment, they brought their survey into the appointment with them and completed it in the waiting room after their medical appointment had ended. All participants fully completed the survey on-site. All participants provided informed consent and were compensated with \$10 cash.

Data Analysis

Preliminary analyses. Prior to conducting the primary statistical analyses to assess the current hypotheses, descriptive statistics (i.e., means, standard deviations, frequencies, and percentages) of participants' previous experiences of discrimination, mental health, grit, perceived social support, healthcare provider trust, and medication adherence were assessed. Based on the clinical cutoff scores empirically derived by scale developers, the percentage of participants that report clinically significant scores on the PHQ-9 and GAD-7 were reported.

Normality tests (i.e., skewness and kurtosis) were conducted to determine whether the scales and subscales are normally distributed. Critical values of 2.0 were used to identify variables that are skewed or kurtotic. Data were checked for multicollinearity via correlation coefficients among all independent variables (with a goal $r < .70$ among all predictors).

To examine bivariate correlations among discrimination experiences, depression, anxiety, grit, social support, healthcare provider trust, and medication adherence, a correlation matrix was created. Scores from the GAD-7 and PHQ-9 were transformed into z-scores and added together

to compute a single mental health variable, since these variables are often found to correlate at .60 or higher.

Primary analyses. A multiple mediation model was developed wherein experienced race-based discrimination will be specified to lead to the combined index of symptoms of depression and anxiety, which was then be specified to lead to healthcare provider mistrust, and finally to medication adherence (Figure 2). All possible direct and indirect effects were examined in this model, and the model was run in AMOS. Because the model was saturated and the sample size far below 200 participants, no fit indices were reported.

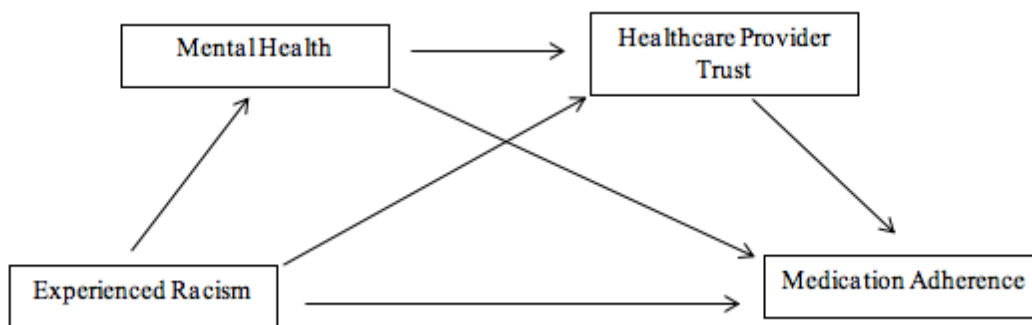


Figure 2. Multiple mediation model of experienced racism, mental health, healthcare provider trust, and medication adherence.

If all paths in this multiple mediational model would have been found to be significant, including the indirect effects, the model would have been expanded to a moderated mediation. The mediations and multiple mediations would have been examined differentially as a function of participants' level of grit and perceived social support running separate-groups comparisons for low, medium, and high levels of the moderators (Figure 3).

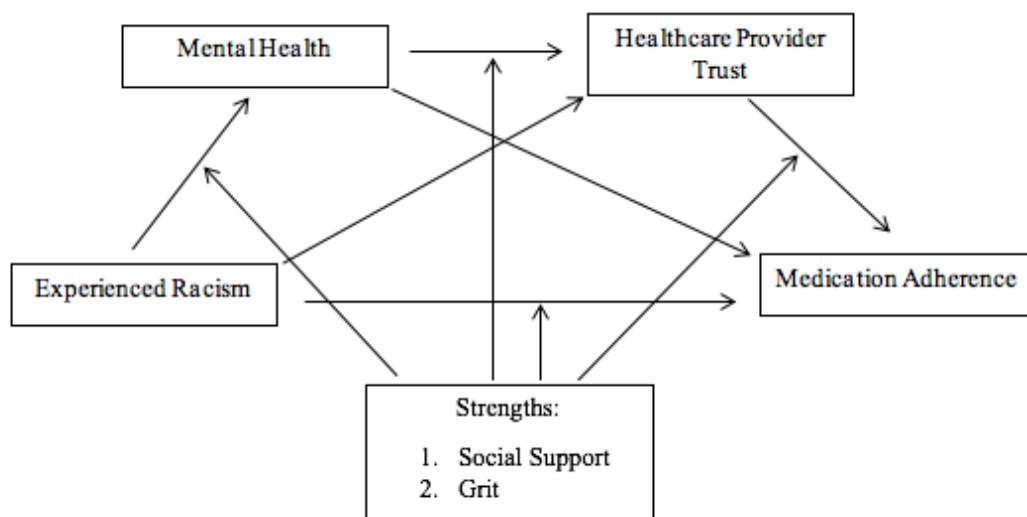


Figure 3. Moderated mediation model of social support and grit on the relationships among experienced racism, depression, anxiety, healthcare provider trust, and medication adherence.

Because one or more of the paths in the multiple mediational model was found to not be significant (outlined below), the model was broken up into its component mediational models and moderated mediations run via the Hayes PROCESS macro with social support and grit as moderators.

Power analysis. Because the overall multiple mediational model was found to have non-significant paths (outlined below), a power analysis was performed using G*Power 3 for the largest power requirement of a moderated mediation in the Hayes PROCESS macro (which contained three possible main effects and two interaction terms, with one dependent variable). With 80% power ($1 - \beta$), the current sample size of 134 participants was able to detect all large- and medium-sized effects, as well small-size effects of Cohen's $f^2 \geq .10$.

Results

Normality and Multicollinearity

Skewness and kurtosis tests were conducted to determine whether the primary study scales were normally distributed. Values of 2.0 identified skewed or kurtotic variables (see Table

1). The skewness and kurtosis coefficients for all primary variables in this study were equal to or smaller in magnitude than 1.04 and -1.21, respectively, suggesting that the data were univariately normal.

Table 1. *Skewness and Kurtosis.*

Variable	Skewness	Kurtosis
Racism	1.04	.35
Mental Health	.37	-.79
Provider Trust	.23	-.23
Medication Adherence	.25	-1.21
Grit	-.31	.76
Social Support	-.04	-.33

Data Cleaning and Normality

Three participants had item-level missing data for the PHQ-9, one for the GAD-7, two for the IPTS, one for the MAQ, and none for the ISEL or the Short Grit Scale. The greatest amount of item-level missingness was 54% of item-level data for one participant on the PHQ-9, and all other participants had at least 50% complete item-level data for all scales. As a result, missingness was extremely minimal, and no participants were excluded. Further, data were found to be missing completely at random using Little's MCAR test ($p = .319$). Missing data were imputed within a scale at the item-level by the expectation maximization procedure after being reverse-coded as applicable, and then summed or averaged. Scores from the GAD-7 and PHQ-9 were transformed into z-scores, added together, and then divided by 2, in order to compute a single mental health variable, since these variables are often found to correlate at .60 or higher. A final cleaned data file was imported to SPSS for the analysis.

Correlation Matrix

A correlation matrix was calculated showing the bivariate relationships among all primary study variables (Table 2). All variables were significantly related to each other as

expected, except for the relationships between racism and grit and between provider trust and grit.

Table 2. *Correlation Matrix*

	1	2	3	4	5
1. Racism					
2. Mental Health	.32**				
3. Provider Trust	-.26**	-.26**			
4. Medication Adherence	.37**	.38**	-.28**		
5. Social Support	-.25**	-.48**	.26**	-.29**	
6. Grit	-.11	-.40**	.06	-.27**	.25**

Note. * $p < .05$. ** $p < .01$

Descriptive Statistics

The descriptive statistics (i.e., means, standard deviations) of participants' mental health, provider trust, medication adherence, social support, and grit appear in Table 3.

Table 3. *Means and Standard Deviations for Study Variables.*

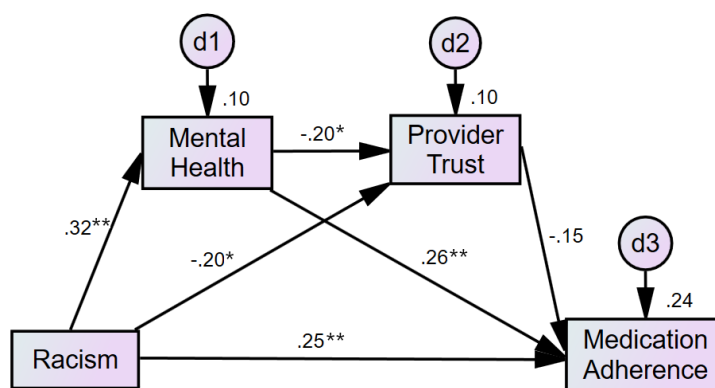
Variable	Mean (SD)
Depression	10.39 (6.79)
Anxiety	8.79 (6.80)
Mental Health*	.00 (.96)
Provider Trust	32.69 (7.84)
Grit	3.35 (.70)
Social Support	30.93 (7.53)
Medication Adherence	1.64 (1.37)
Racism	6.52 (3.87)

Based on the clinical cutoff item total of 5 for the PHQ-9 (Kroenke, Spitzer, & Williams, 2001), 78.3% participants met or surpassed the threshold for clinically significant depression symptoms, with 23.1% of participants with minimal symptoms (total score 5-9), 29.1% with mild symptoms (total score 10-14), 14.9% with moderate symptoms (total score 15-19), and 11.2% with severe symptoms (total score 20+). Concerning anxiety, 67.2% of participants met or surpassed threshold for clinically significant anxiety symptoms (cut off score of 5; Spitzer,

Kroenke, Williams, & Löwe, 2006), with 22.4% participants with mild symptoms (total score 5-9), 22.4% with moderate symptoms (total score 10-14), and 22.4% with severe symptoms (total score 15+).

Multiple Mediation Path Model

The multiple mediation model wherein experienced race-based discrimination was specified to lead to mental health, which was then be specified to lead to healthcare provider mistrust, and finally to medication adherence had a number of significant direct effects, is shown in Figure 4.



Note. * $p < .05$. ** $p < .01$

Figure 4. Multiple mediational model with standardized path coefficients.

All direct paths within the model were statistically significant, except for the path between provider trust and medication adherence, $p = .057$. The standardized indirect effect of racism on provider trust through mental health was statistically significant, $\beta = .06$, $p = .023$, as was the standardized indirect effect of mental health on medication adherence through provider trust, $\beta = .03$, $p = .028$. Finally, the multiple mediational effect of both mental health and provider trust on the relationship between racism and medication adherence was statistically significant, $\beta = .12$, $p < .001$.

Moderated Mediations

In order to determine whether these mediational effects differed as a function of participants' levels of social support and grit (a moderated mediation), conditional PROCESS models were created. Regarding the relationship between racism and provider trust, with mental health as a mediator and social support as a moderator, the overall model was significant, $F(5, 128) = 3.75, p = .003, R^2 = .13$. The direct effects of racism to mental health ($b = .06, p = .003$) and racism to provider trust ($b = -.41, p = .029$) were statistically significant. The direct effect of mental health to provider trust was not statistically significant ($b = -.95, p = .246$). The interactions between racism \times social support ($b = -.022, p = .341$) and mental health \times social support ($b = -.00, p = .979$) were not statistically significant, indicating that the direct effects from racism to provider trust and from mental health to provider trust were not moderated by social support. For the moderated mediation component of the analysis, the indirect effect of racism on provider trust through mental health was not statistically significant at any of the three levels of social support. As a result, no moderated mediation was found (Table 4).

Table 4. *Conditional Indirect Effects of Social Support on Racism and Provider Trust, through Mental Health.*

Social Support	Effect Size (b)	Standard Error	95% Confidence Interval	
			Lower Limit	Upper Limit
-7.5346	-.0372	.0488	-.1518	.0418
.0000	-.0561	.0537	-.1781	.0359
7.5346	-.0757	.1048	-.3222	.0920

Regarding the relationship between racism and provider trust, with mental health as a mediator and grit as a moderator, the overall model was significant, $F(5, 128) = 3.13, p = .011, R^2 = .11$. The direct effects of racism to mental health ($b = .07, p < .001$) and mental health to provider trust ($b = -1.79, p = .024$) were statistically significant. The direct effect of racism to

provider trust was not statistically significant ($b = -.34, p = .071$). The interactions between racism \times grit ($b = .30, p = .349$) and mental health \times grit ($b = -.57, p = .618$) were not statistically significant, indicating that the direct effects from racism and mental health to provider trust were not moderated by grit. For the moderated mediation, the indirect effect of racism on provider trust through mental health was statistically significant at moderate levels but not at low or high levels. When examining the magnitude of the indirect b-weights, they increased linearly as grit increased, although the standard error for the indirect effect in the group with a moderate level of grit was smaller in magnitude than those of the other two groups (based on having a larger sample size than the other groups, as 66% of participants fall within \pm one standard deviation of the mean). Therefore, this effect at only the moderate but not high or low levels of grit should be seen as a statistical artifact and not a true effect. As a result, no moderated mediation was found, despite the apparent linear increase in indirect effect magnitude (Table 5).

Table 5. Conditional Indirect Effects of Grit on Racism and Provider Trust, through Mental Health.

Grit	Effect Size (b)	Standard Error	95% Confidence Interval	
			Lower Limit	Upper Limit
-.6987	-.0960	.0929	-.3084	.0666
.0000	-.1260	.0701	-.2826	-.0119
.6987	-.1571	.1255	-.4641	.0245

Regarding the relationship between racism and medication adherence, with mental health as a mediator and social support as a moderator, the overall model was significant, $F(5, 128) = 7.40, p < .001, R^2 = .22$. The direct effects of racism to mental health ($b = .059, p = .003$), racism to medication adherence ($b = .10, p = .002$), and mental health to medication adherence ($b = .34, p = .013$) were statistically significant. The interactions between racism \times social support ($b = .00,$

$p = .651$) and mental health \times social support ($b = -.00$, $p = .761$) were not statistically significant, indicating that the direct effects from racism and mental health to medication adherence were not moderated by social support. For the moderated mediation, the indirect effect of racism on medication adherence through mental health was statistically significant at moderate levels but not at low or high levels, as before. Again, when examining the magnitude of the indirect b-weights, they increased linearly as social support increased, although the standard error for the indirect effect in the group with a moderate level of social support was smaller in magnitude than those of the other two groups. Therefore, this effect at only the moderate but not high or low levels of social support should be seen as a statistical artifact. Again, no moderated mediation was found, despite the apparent linear increase in indirect effect magnitude (Table 6).

Table 6. *Conditional Indirect Effects of Social Support on Racism and Medication Adherence, through Mental Health.*

Social Support	Effect Size (b)	Standard Error	95% Confidence Interval	
			Lower Limit	Upper Limit
-7.5346	.0149	.0122	-.0066	.0427
.0000	.0201	.0111	.0019	.0440
7.5346	.0239	.0175	-.0028	.0641

Regarding the relationship between racism and medication adherence, with mental health as a mediator and grit as a moderator, the overall model was significant, $F(5, 128) = 8.05$, $p < .001$, $R^2 = .24$. The direct effects of racism to mental health ($b = .07$, $p < .001$), racism to medication adherence ($b = .10$, $p = .002$), and mental health to medication adherence ($b = .32$, $p = .014$) were statistically significant. The interactions between racism \times grit ($b = -.02$, $p = .707$) and mental health \times grit ($b = -.12$, $p = .516$) were not statistically significant, indicating that the direct effects from racism and mental health to medication adherence were not moderated by

grit. For the moderated mediation, the indirect effect of racism on medication adherence through mental health was statistically significant at low and moderate levels of grit but not at high levels. When examining the magnitude of the indirect b-weights, they decreased linearly as grit increased. This pattern suggests a moderated mediation such that higher levels of grit dampened the indirect effect (Table 7).

Table 7. *Conditional Indirect Effects of Grit on Racism and Medication Adherence, through Mental Health.*

Grit	Effect Size (b)	Standard Error	95% Confidence Interval	
			Lower Limit	Upper Limit
-.6987	.0277	.0175	.0000	.0686
.0000	.0224	.0112	.0031	.0470
.6987	.0168	.0149	-.0118	.0484

Discussion

The current study aimed to explore the relationship between experienced racism and medication adherence through mental health and provider trust. In order to examine the possible buffering effects of personal and collective strengths, the current study assessed the effects of participants' levels of social support and grit on the proposed relationships. It was hypothesized that both mental health and provider trust would mediate the relationship between experienced racism and medication adherence, as well as that social support and grit would attenuate these relationships. Results revealed that both mental health and provider trust were significant multiple mediators. Similarly, mental health mediated the relationship between racism and provider trust, and provider trust mediated the relationship between mental health and medication adherence. Thus, the current study's initial hypothesis was supported. All paths within this model were statistically significant, except the path between provider trust and

medication adherence which approached significance. Social support did not moderate any of the mediational relationships, but grit moderated the indirect relationship between racism and medication adherence through mental health such that at increased levels of grit, this indirect effect became non-significant. Thus, the second component of the hypothesis was partially supported.

Parallels to Previous Research

The results of the current study reflect several findings from previous literature. The current study revealed experienced racism to predict both provider trust and poorer medication adherence, while mental health served as a mediator of the series of relationships. The path between racism and mental health corroborate findings from several previous studies, which have shown racism and discrimination to predict greater levels of depression and anxiety symptomology (Broman et al., 2000; Greer, 2011; Landrine & Klonoff, 1996; Schulz et al., 1996). The significant mediation models observed in the current study revealed mental health functioning to significantly predict both medication adherence and provider trust. These results also support findings from previous literature which has demonstrated reduced anxiety symptoms to be associated with higher medication adherence (Bauer et al., 2012). Regarding provider trust, research has shown low levels of provider trust to be associated with greater depression (Ciechanowski, Katon, & Russo, 2005; Mancuso, 2010; Schneider, Konijin, Krihetti, & Rusbult, 2011), and patients who reported greater trust were less likely to develop depression over the course of treatment (Kim, Chung, Perry, Kawachi, & Subramanian, 2012).

The current study found experienced racism to significantly predict provider trust and medication adherence, as separate outcomes, but showed an insignificant relationship between provider trust and medication adherence, when mental health and provider trust were included in

a multiple mediation model. This is in contrast to the bivariate relationship between provider trust and medication adherence shown in the correlation matrix. Results from the latter path of the model (e.g., provider trust to medication adherence) differ from findings from previous studies. For example, a few studies found less provider trust to relate to poor treatment adherence (Benkert et al., 2006; Chen & Yang, 2013; Rybarczyk et al., 2017). Additionally, Bauer and colleagues (2014) found a strong association between provider trust and medication adherence, demonstrating that less provider trust strongly predicted antidepressant non-adherence. Patient-provider trust was found to relate to medication adherence behaviors in adult primary patients (Nguyen et al., 2009; Wang & Wu, 2007). For the current study, the statistical insignificance of this path of the model may reflect eclipsed statistical effects from racism and mental health.

Findings from the current study reflect previously established literature, which has proposed that grit is a positive coping response to discrimination within the Black community (McGee & Stovall, 2015). Further, Sharkey and colleagues (2017) suggested that grit reflects positive health behaviors, which parallels with the current study's revealed moderating effect on the relationship between racism and medication adherence, through mental health. These results suggest higher levels of grit among Black patients in primary care settings with reported racism experiences may alleviate associated negative outcomes, such as poor medication adherence. The current study's results also showed that grit did not buffer the relationship between racism and provider trust through mental health. Previous literature has minimally explored the moderating effect of grit onto provider trust, but results from the current study may reflect an inadequately powered sample size of this construct at low and high levels (i.e., 66% of sample lies within \pm one standard deviation of the mean). Regarding the moderating effect of social support, various studies have shown social support to positively affect health-related stress, health behaviors, and

perceived symptom severity (Williams et al., 2017; Prins et al., 2011; Williams et al., 2018), which conflict with results from the current study. Similar to grit's moderating effect on racism and provider trust through mental health, the current study's results may demonstrate how the sample does not have enough power to detect a true effect across low, moderate, and high levels of social support. Or, social support may simply not buffer these direct or indirect effects in this sample of Black safety-net primary care patients.

Implications

The results of the study yield several clinical and public health implications. Broadly, results support an indirect relationship between racism and both provider trust and medication adherence, through mental health. This trend shows that previous experiences of discrimination can result in a cascade of events, many of which may negatively impact attitudes towards healthcare and treatment outcomes. Previous literature has shown racism and discrimination to predict significant life stress, anxiety, and hypervigilance similar to PTSD presentations (Soto et al., 2011; Carter & Forsyth, 2010). Sadock and colleagues (2017) noted that racial and ethnic minorities tend to typically present in primary care facilities which demonstrates the utility for in-depth racial sensitivity training for healthcare providers. Research has also shown that Black patients tend to report mental health symptoms of secondary concern (e.g., Cuffee et al., 2013), so if patients have had significant experiences of racism, they may be more likely to report mental health symptoms, but nonetheless these mental health symptoms may still be underreported.

Additionally, integrated primary care facilities and safety-net clinics serve as a “one stop shop” for patients that utilize their services, many of whom often receive physical health, pharmaceutical, and behavioral health services from providers who collaboratively construct

holistic treatment plans. Data from the Daily Planet Health System's 2017 annual report corroborated this "one stop shop" approach to healthcare. In that report, 70% of patients were uninsured, 13% were covered by Medicaid, 10% Medicare, and 7% were covered by private insurance. Of the 37,961 patient encounters, 11,542 of them (30.4%) of healthcare visits were mental health encounters, and 14,608 (38.4%) were encounters with a primary care physician, thus showing a high level of integration of healthcare (Daily Planet Health Services, 2018).

Results from the current study may further demonstrate the need for integrated primary care services, namely, behavioral health, since depression and anxiety symptom presentations were fairly common. Around 78% of the sample met the clinically significant threshold for depression and 67% for anxiety, suggesting that prevalence rates of depression and anxiety symptoms in this specific sample were extremely high and underscoring the need for mental health services. Finally, health care providers and administrators should construct programs and interventions to facilitate the refinement of personal strengths to buffer potential effects of racism and associated health outcomes (i.e., mental health, provider trust, and medication adherence). Duckworth theorized interventions can increase grit by positively changing how individuals believe in themselves; however, this process has yet to be shown in research (Gough, 2013). Regarding mental health, research has shown higher levels of gratitude and grit served as buffers to suicidal ideation (Kleiman, Adams, Kashdan, Riskind, 2013). Although no intervention is currently used to further develop grit, experimental exercises have been shown to increase factors related to grit, such as perseverance (Baumeister, Gailliot, DeWall, & Oaten, 2006). Healthcare-based interventions that incorporate strategies to build long-term perseverance and self-regulation among primary care patients may increase grit which could similarly serve as personal strengths to buffer the associated effects of racism and other socially-derived stressors.

Limitations and Future Directions

The current study had several limitations which are also directions for future research. The unique effect of provider trust on medication adherence approached statistical significance (at $p = .057$), so the current study's sample size was just underpowered to pick up on this effect. Future research with larger sample sizes should investigate the same paths, as well as investigate reasons why adding racism and mental health as predictors of medication adherence made the relationship between provider trust and medication adherence non-significant. Research from Cole and Preacher (2014) has shown that measurement error can result in over or under estimation of parameters within path analyses. Often, independent or predictor variables within these models that have measurement error have been shown to inflate path coefficients, especially in mediation models (Hoyle & Kenny, 1999; Ledgerwood & Shrout, 2011). Thus, future research should investigate this series of relationships while attending to potential measurement error, which may have resulted in over or underestimation of path coefficients in the current study. The current study combined depression and anxiety into a single mental health score. In order to differentiate possible different roles that depression and anxiety play in predicting provider trust and medication adherence, it is recommended that future research investigate the magnitude of the relationships differentially for both mental health variables. Previous research has highlighted that racial discrimination may not be as strong of a predictor of anxiety as compared to racial harassment (Carter & Forsyth, 2010), so future research may also explore the difference between racial discrimination and racial harassment. The current study specifically assessed racial harassment with the DLE subscale of the RaLES (Harrell, 1997). Future literature should utilize the scale in its entirety to fully capture the operation of racism on the interpersonal, institutional, and structural levels. Regarding methodology and statistical

analyses, the Grit-S scale was shown to have poor internal consistency regarding the perseverance of effort subscale, which may have impacted its overall statistical significance in the moderated mediation models. A systematic review published by Datu, Yuen, and Chen (2017) has suggested that the *consistency of interests* subscale is fundamentally different from the *perseverance of effort* subscale, within collectivist cultures, which may suggesting they should be separately utilized in analyses. The current study did not separately assess grit as a function of perseverance of effort and consistency of interests due to limited research supporting that these suggested independent constructs exist in healthcare contexts. However, future research should assess if grit differentially operates as a buffer of racism and associated health outcomes. Similarly, the ISEL has been minimally used among Black populations, and research has suggested to further validate its utility among this group (Kendzor et al., 2009). Finally, the current study did not prompt participants to indicate what service they were originally referred for. In order to assess efficacy of bridge to care and integration of services, future studies should ask participants to report their presenting concern(s) and/or the health service(s) they typically utilize.

Conclusion

Results from this study showed racism predicted both provider trust and medication adherence through mental health. Further, grit, a personal strength, was shown to serve as a buffer of the indirect effect of racism on medication adherence through mental health. Although the study's hypotheses were partially supported, these results may serve as catalysts to assess specific minority-based stressors and associated outcomes within healthcare settings. Several of these stressors can be prevented or at least lessened (i.e., provider bias, cultural insensitivity, or discrimination), and community and personal strengths can dampen the effects of these

marginalized experiences. It is not the sole responsibility of underserved communities to possess qualities to buffer the effects of their experiences. Further, healthcare systems and providers can incorporate culturally sensitive mechanisms to lessen the relationship between experienced discrimination and negative health outcomes and behaviors. Although the latter may take substantial time and resources, results show that personal attributes can serve as meaningful coping mechanisms in the interim.

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Appendix A: Study Measures

Daily Life Events (DLE) subscale of the Racism and Life Experiences Scale (RaLes; Harrell, 1997).

How often have you...

1. Been treated rudely or disrespectfully because of your race?
 - a. Never
 - b. Less than once a year
 - c. A few times a year
 - d. About once a month
 - e. A few times a month
 - f. Once a week or more

2. Been insulted, called a name, or harassed because of your race?
 - a. Never
 - b. Less than once a year
 - c. A few times a year
 - d. About once a month
 - e. A few times a month
 - f. Once a week or more

3. Been laughed at, made fun of, or taunted because of your race?
 - a. Never
 - b. Less than once a year
 - c. A few times a year
 - d. About once a month
 - e. A few times a month
 - f. Once a week or more

Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001).

Over the last 2 weeks, how often have you been bothered by any of the following problems?

1. Little interest or pleasure in doing things?
 - a. Not at all
 - b. Several Days
 - c. More than half the days
 - d. Nearly every day

2. Feeling down, depressed, or hopeless?
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

3. Trouble falling or staying asleep, or sleeping too much?
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

4. Feeling tired or having little energy
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

5. Poor appetite or overeating?
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down.
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

7. Trouble concentrating on things, such as reading the newspaper or watching television.
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual.
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

9. Thoughts that you would be better off dead, or of hurting yourself.
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

10. If you have indicated having been bothered by *any* of these problems, how *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

Generalized Anxiety Disorder Scale (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006).

Over the last 2 weeks, how often have you been bothered by the following problems?

1. Feeling nervous, anxious, or on edge
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

2. Not being able to stop or control worrying
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

3. Worrying too much about different things
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

4. Trouble relaxing
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

5. Being so restless that it's hard to sit still
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

6. Being easily annoyed or irritable
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

7. Being afraid as if something awful might happen
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

8. If you indicate being bothered by any of these problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?
 - a. Not difficult at all
 - b. Somewhat difficult
 - c. Very difficult
 - d. Extremely difficult

Interpersonal Physician Trust Scale (IPTS; Hall et al., 2002).

	Strongly Disagree (a)	Disagree (b)	Neutral (c)	Agree (d)	Strongly Agree (e)
1. Healthcare providers will do whatever it takes to get you all the care you need.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Sometimes healthcare providers care more about what is convenient for them than about your medical needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Healthcare providers' medical skills are not as good as they should be.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Healthcare providers are extremely thorough and careful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Strongly Disagree (a)	Disagree (b)	Neutral (c)	Agree (d)	Strongly Agree (e)
5. You completely trust healthcare providers' decisions about which medical treatments are best for you.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Healthcare providers are totally honest in telling you about all of the different treatment options available for your condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Healthcare providers only think about what is best for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

you.					
8. Sometimes healthcare providers do not pay full attention to what you are trying to tell them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. You have no worries about putting your life in healthcare providers' hands.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. All in all, you have complete trust in healthcare providers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Medication Adherence Questionnaire (MAQ; Morisky et al., 1986).

	Please check one box on each line	
	Yes (a.)	No (b.)
1. Do you ever forget to take your medicine?	<input type="checkbox"/>	<input type="checkbox"/>
2. Are you careless at times about taking your medicine?	<input type="checkbox"/>	<input type="checkbox"/>
3. Sometimes if you feel worse when you take the medicine, do you stop taking it?	<input type="checkbox"/>	<input type="checkbox"/>
4. When you feel better do you sometimes stop taking your medicine?	<input type="checkbox"/>	<input type="checkbox"/>

Short Grit Scale (Grit-S; Duckworth & Quinn, 2009).

1. New ideas and projects sometimes distract me from previous ones.
 - a. Very much like me
 - b. Mostly like me
 - c. Somewhat like me
 - d. Not much like me
 - e. Not like me at all

2. Setbacks don't discourage me.
 - a. Very much like me
 - b. Mostly like me
 - c. Somewhat like me
 - d. Not much like me
 - e. Not like me at all

3. I have been obsessed with a certain idea or project for a short time but later lost interest.
 - a. Very much like me
 - b. Mostly like me
 - c. Somewhat like me
 - d. Not much like me
 - e. Not like me at all

4. I am a hard worker.
 - a. Very much like me
 - b. Mostly like me
 - c. Somewhat like me
 - d. Not much like me
 - e. Not like me at all

5. I often set a goal but later choose to pursue a different one.
 - a. Very much like me
 - b. Mostly like me
 - c. Somewhat like me
 - d. Not much like me
 - e. Not like me at all

6. I have difficulty maintaining my focus on projects that take more than a few months to complete.
 - a. Very much like me
 - b. Mostly like me

- c. Somewhat like me
 - d. Not much like me
 - e. Not like me at all
7. I finish whatever I begin.
- a. Very much like me
 - b. Mostly like me
 - c. Somewhat like me
 - d. Not much like me
 - e. Not like me at all
8. I am diligent.
- a. Very much like me
 - b. Mostly like me
 - c. Somewhat like me
 - d. Not much like me
 - e. Not like me at all

Interpersonal Support Evaluation List (ISEL; Cohen & Hoberman, 1983).

1. If I wanted to go on a trip for a day (e.g., to the mountains, beach, or country), I would have a hard time finding someone to go with me.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

2. I feel that there is no one I can share my most private worries and fears with.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

3. If I were sick, I could easily find someone to help me with my daily chores.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

4. There is someone I can turn to for advice about handling problems with my family.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

5. If I decide one afternoon that I would like to go to a movie that evening, I could easily find someone to go with me.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

6. When I need suggestions on how to deal with a personal problem, I know someone I can turn to.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

7. I don't often get involved to do things with others.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

8. If I had to go out of town for a few weeks, it would be difficult to find someone who would look after my house or apartment (the plants, pets, garden, etc.).
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

9. If I wanted to have lunch with someone, I could easily find someone to join me.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

10. If I was stranded 10 miles from home, there is someone I could call who would come and get me.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

11. If a family crisis arose, it would be difficult to find someone who could give me good advice.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false

12. If I needed some help in moving to a new house or apartment, I would have a hard time finding someone to help me.
 - a. Definitely true
 - b. Probably true
 - c. Probably false
 - d. Definitely false