國立臺灣大學社會科學院社會學系

碩士論文

Department of Sociology

College of Social Sciences

National Taiwan University

Master's Thesis

社會心理資源做為種族醫療不平等之中介因素：美國全國縱貫資料之分析

Psychosocial Resources as Mediators of Racial Healthcare Disparities: Evidence from National Panel Study

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中華民國一一四年二月

February 2025

doi:10.6342/NTU202500318

國立臺灣大學碩士學位論文
口試委員會審定書

社會心理資源作為種族醫療不平等之中介因素：美國全國縱貫資料之分析

Psychosocial Resources as Mediators of Racial Healthcare Disparities: Evidence from National Panel Study

本論文係管靚君（R11325003）在國立臺灣大學社會學系、所完成之碩士學位論文，於民國 113 年 10 月 7 日承下列考試委員審查通過及口試及格，特此證明

口試委員：

(簽名)

(指導教授)

doi:10.6342/NTU202500318

摘要

本研究旨在探討社會心理資源在美國種族間醫療照護資源使用不平等中所扮演之角色。本研究使用美國全國青年長期追蹤調查（NLSY1997），並以受限能力模型（Reserved Capacity Model）發展新的理論模型，用於探索個人內部與人際間的社會心理資源如何分別影響非拉丁美洲裔白人、拉丁美洲裔與非裔美國人所感知道自己對醫療照護資源的需求，以及其實際使用醫療照護資源之行為。透過多層次非線性迴歸分析與多層次中介分析，本研究發現拉丁美洲裔與非裔美國人平均而言回報較少的醫療照護資源的需求，也較少使用其所能近用的資療照護資源，而這樣的行為傾向受到心理健康與工作福利支持等因素中介。相對於原先的受限能力模型，本研究發現較心理健康較差者反而較多地使用醫療照護資源，顯示心理壓力有可能使個人的就醫行為更傾向於積極。如此發現不僅彰顯醫療資源不平等之議題複雜性，更暗示後續政策應有機會利用社會心理資源之力量來縮減種族之間的醫療資源使用行為之差異。

關鍵字：種族醫療資源使用不平等、受限能力模型、社會心理資源、中介分析、美國全國青年長期追蹤調查

doi:10.6342/NTU202500318

Abstract

This study investigates the role of psychosocial resources in the racial-ethnic disparities of healthcare utilization. Using data from the National Longitudinal Survey of Youth 1997, the study applies the Reserve Capacity Model to explore how intrapersonal and interpersonal psychosocial resources impact the perceived needs and behaviors of healthcare utilization among African American, Hispanic, and Non-Hispanic White populations. The results of multilevel non-linear regression and mediation analysis reveal that while racial-ethnic minorities generally report fewer healthcare needs and less frequent utilization, certain psychosocial factors significantly mitigate the observed racial-ethnic gaps in healthcare utilization. Contrary to the RCM's predictions, increased mental distress was associated with heightened healthcare utilization, suggesting that intense psychological states may drive more active healthcare-seeking behaviors. The findings underscore the complexity of healthcare disparities and suggest that policies should leverage psychosocial factors, particularly institutional support, to address these gaps and promote equitable healthcare access across racial-ethnic groups.

Keywords: Racial Healthcare Disparities, Reserved Capacity Model, Psychosocial Resources, Mediation Analysis, NLSY97

doi:10.6342/NTU202500318

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1. Introduction

Racial healthcare disparities, which refer to the systematic inequalities in accessing, receiving, and utilizing health care services among racial-ethnic groups, been a persistent issue in the United States. Investigations conducted by both governmental and non-governmental organizations have illustrated the racial-ethnic gaps in access, quality, utilization, and quality of healthcare (KFF, 2023; Commonwealth Fund, 2024), and the presence of COVID-19 was only to exacerbate the existing discrepancy (Agency of Healthcare Research and Quality [AHRQ], 2023; 2024). Plenty of previous studies have attempted to propose a comprehensive theory in addressing the complex mechanisms that account for the racial-ethnic healthcare disparities. For example, *Unequal Treatment* (Institute of Medicine, 2013), which was a collective research work dedicated to unraveling the underlying causes of racial-ethnic treatment inequality, addressing the potential factors from health-system, care-process, and patient-level. A social psychological approach later proposed by Penner et al. (2013; 2014) also adopted a multilevel framework to identify the intrapersonal, interpersonal, and society-level process that can attribute to the observed racial-ethnic gaps in healthcare. These approaches have explored various mechanisms and commonly highlighted the importance of psychosocial factors such as past discrimination experiences, mistrust toward White physicians and health services which are usually dominated by White staffs, the stereotype threats, etc. in explaining the racial-ethnic discrepancy of receiving healthcare.

However, since these theories are based on analyses mainly focusing on patient behaviors and physician-patient interactions within clinical or hospital settings, they are limited to explaining healthcare disparities that occur specifically during medical encounters. Meanwhile, the potential mechanisms of disparities in the decision-making and behavioral patterns of healthcare utilization that took place before medical encounters remained

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unscrutinized. To be more specific, it has not been systematically examined whether the disparities in healthcare utilization can also be explained by the different psychosocial experiences among racial-ethnic groups. Therefore, the current study intends to fill the intellectual gap by answering the following research questions: (1) How are the psychosocial factors distributed and working across racial-ethnic groups? (2) What are the roles of psychosocial factors in racial-ethic disparities of healthcare utilization?

To address research questions, I adopt the Reserve Capacity Model, which hypothesizes that intrapersonal and interpersonal resilient resources experience in daily life form one's mental capacity in cognition and further lead to beneficial or detrimental health behaviors (Gallo et al., 2009), as the foundation for developing theoretical framework that helps to answer the research questions. RCM is considered to be an appropriate framework for its focus on psychosocial factors as pathways to behavioral outcomes. Research hypotheses based on the theoretical framework will be examined using multilevel regression and mediation analysis with data from the National Longitudinal Survey 1997. The main goal of this research is to enhance understanding of the formation process of racial healthcare disparities.

2. Literature Review

In the following chapter, I examine the important theoretical approaches and corresponding evidence in the literature on racial healthcare disparities. I start by reviewing the early discussion that racial healthcare disparities were regarded as the demonstration of racial differences in resources access. However, as evidence suggests that the racial gap in healthcare remains after controlling for access, researchers attempted to identify other potential mechanisms that account for the disparities. The multilevel approach proposed by Institute of Medicine (2013) has identified the health system-, care process-, and patient-level

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factors resulting in unequal treatments across racial-ethnic groups. Attention to the roles of psychosocial factors in racial healthcare disparities has been preliminarily raised. The sociology psychological approach suggested by Penner et al. (2013) took a closer look at the effects of intrapersonal and interpersonal cognitive process that can lead to disparities in healthcare. Nonetheless, I note that Penner et al.'s approach mainly focused on investigating psychological experiences and social interactions in fixed scenarios, which is the medical encounters. Such focus might hinder us from realizing that healthcare disparities could have started before the racial minorities officially entered the healthcare system and adopted the role of "patient". To fill this intellectual gap, I suggest brining in the insight of Reserved Capacity Model (Gallo & Matthews, 2003). RCM highlighted the role of psychological and social resilience resources in mediating the relationship between race-ethnicity and health-related behaviors and suggested that minorities with limited mental capacity tend to perform behaviors that further lead to poorer health outcomes. I consider RCM serves as a useful approach in supplementing Penner et al.'s model for investigating whether psychosocial factors experienced in daily life impact one's patterns of healthcare utilization, which is a process occurring before one formally enters the healthcare system but critically determines whether they would receive the care they need.

2.1 Racial Healthcare Disparities

To organize a theoretical framework for investigating racial healthcare disparities, the discussion should start with revisiting racial disparities in health outcomes. Racial health disparities describe the "preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health" that are experienced by the population with disadvantaged racial-ethnic background (Center for Disease Control [CDC], 2008). The research of racial healthcare disparities was fundamentally based on the discussion of racial health disparities for the former was initially considered to be a demonstration of unequal

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distribution of opportunities to achieve better health outcomes. The exploration of racial health disparities within the existing literature can be traced back to DuBois's seminal work in 1906, which focused on the difference of health and physique between African and Caucasian Americans. DuBois argued that the health difference between African Americans and Caucasians were indicative of underlying social forces. Decades later, Black's Report (Court, 1981; Gray, 1982) has been published in the U.K., providing further empirical evidence of racial inequalities in both health outcomes and healthcare.

With the focus on disparities in health outcomes, early discussion mostly regarded racial-ethnic gaps in healthcare as one of the mechanisms that result in unequal health outcomes among racial-ethnic groups (Williams & Collins 1995) and identified healthcare disparities as a demonstration of unequal access to flexible resources that can enhance one's health status (Phelan & Link, 2015). For example, the racial-ethnic minorities' averagely lower socioeconomic status was deemed as the main source of the disparities in healthcare. Population in lower SES have been found to have poorer access to healthcare due to lacking financial support or the geographical barrier caused by living segregation (Link & Phelan, 1995). Therefore, researchers believed that the original SES gap among racial-ethnic groups further lead to the racial-ethnic disparities in healthcare. However, healthcare inequalities among racial-ethnic groups have been proved to persist after controlling for the difference in socioeconomic status (Williams & Rucker, 2000; Saha et al., 2003), suggesting that there are more potential factors leading to racial-ethnic healthcare disparities awaiting to be disclosed.

Later research propelled racial inequalities of healthcare to the forefront of discourse in the fields of health and social studies, shifting the early focus from the racial gaps in health outcomes to healthcare. More and more studies have shown abundant evidence of how attitudes, behaviors, and experiences regarding healthcare can vary across racial-ethnic groups. For example, African Americans tend to express less trust toward the medical system

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and their healthcare provider (Gordon et al., 2006; Halbert et al., 2006; Dovidio et al., 2008; Saha et al., 2010). Behavior wise, Charron-Chénier and Mueller (2018) have demonstrated that households with disadvantaged racial background tend to spend less on medical care when compared to white households. Research on patients with diabetes also found that racial-ethnic minorities have significantly lower medical expenditure, suggesting that they might not be receiving the proper health care they need (Lee et al., 2006; Dawson et al., 2021). Moreover, scholars have noted that the so-called "overuse" or "inappropriate use" of ER resources found in racial-ethnic minorities suggests inadequate access to primary care (Hazel-Fernandez et al., 2015; Parast et al., 2022). As for the difference in healthcare experiences, patients who are racial-ethnic minorities tend to report worse experiences of health care they receive (Pandit et al., 2022) and poorer communication with their healthcare providers (Palmer et al., 2014; Guimond et al., 2022). It has also been found that providers might give different diagnosis, describe different dose of medication or provide care with different content according to the patient's racial-ethnic background (Shavers & Brown, 2002; Institute of Medicine, 2003; Mark et al., 2003). As the evidence of racial-ethnic gap in healthcare has been established, researchers went on to inquire about the potential mechanisms behind racial-ethnic healthcare disparities.

In the work *Unequal Treatment* (Institute of Medicine, 2003), the authors have identified health system-, care process-, and patient-level factors as the potential causes of racial healthcare disparities and illustrated a framework that intends to elaborate on the complexity of racial healthcare disparities. The racism in the health system as well as other institutions in the United State serve as the system-level factor of racial healthcare disparities. For example, the racial residential segregation leads to the unequal geographical availability of medical services and healthcare institutions among racial-ethnic groups (Williams & Collins 2001; Institute of Medicine, 2003). Also, the discriminative design of health

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insurance plan often favors individuals with stable employment status and income, which left the racial-ethnic minorities who receive lower income, have more unstable career, or work in jobs without health benefits insured or lose their insurance more easily (Sohn, 2017). Overall poor access has been hindering racial-ethnic minorities from seeking the healthcare they need.

The care process-level factors refer to barriers that arise during the care seeking process. The providers' patient preferences, racial bias, clinical uncertainty, and stereotypes against racial-ethnic minorities determine the content and direction of the provider-patient interaction, which might later lead to treatment biases (Institute of Medicine, 2003; Nelson & Hackman, 2012; Spencer & Grace, 2016). The poorer interaction and communication experiences involving racial discrimination would likely distress patients racial-ethnic minorities, exacerbate their mistrust toward to medical system, therefore being more reluctant to utilize healthcare even despite the improving accessibility.

Finally, the patients' attitudes and behaviors regarding healthcare serve as patient-level factors that foster racial healthcare disparities. In addition to the mistrust toward medical system that has been mentioned earlier, the overall lower level of health literacy and cultural mismatch between patients and their providers are also causes that drive racial-ethnic minorities away from the orthodox medical system, leading to problematic healthcare relevant behaviors such as lower adherence to the providers' instructions or higher rates of refusing the recommended treatment. They also noted that there's an understudied hypothesis suggesting the utilization gaps among racial-ethnic groups might have been resulted from White people's "overuse" of healthcare rather than the racial-ethnic minorities' avoidance of seeking care. However, this hypothesis has not been systematically tested in the previous studies (Institute of Medicine, 2003).

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While theoretical framework provided by Institute of Medicine gave a comprehensive review of how racial healthcare disparities are formed, their model was mainly designed to explain how racially disparate clinical decisions were made for their purpose was to propose interventions that target on the health policies and healthcare providers to reduce disparities. While intervention like cross-culture education in health professions might reduce the influence of discrimination or racial stereotypes in provide-patient interactions and help the medical system to regain trust from racial-ethnic minorities, the problem of poor health literacy and lack of knowledge regarding how to better use healthcare remain as barriers for minorities to fully utilize accessible resources. As stated in their work, more research regarding how patient-level factors might influence healthcare still needs to be done. It is therefore important for us to investigate whether attitude- or behavior-related factors might be driving racial-ethnic minorities away from seeking appropriate healthcare they need.

2.2 The Social Psychology Approach in Understanding Racial Healthcare Disparities

Recognizing the complexity of the racial-ethnic healthcare disparities, Penner et al., (2013; 2014) also proposed a multilevel model that illustrated how societal, interpersonal, and intrapersonal factors work simultaneously to form the observed racial-ethnic gap in healthcare. Penner et al. adopted a social-psychological approach for analysis and put more emphasis on demonstrating the role of race-ethnic related thoughts, feelings, and behaviors in healthcare disparities. The focus of psychosocial factors in this model helps to fill the gap of the unscrutinized impact of patient-level factors in forming disparities.

Societal-, interpersonal-, and intrapersonal-level processes have been identified in Penner's model. The societal-level process refers to racial bias and discrimination operating through social norms, policies, and practices and create social conditions that either result in healthcare disparities directly or foster psychological environments that hinder racial-ethnic

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minorities from seeking proper healthcare they need (Penner et al., 2013). In fact, the societal-level process described by Penner et al. is very much similar to *Unequal Treatment*'s (Institute of Medicine, 2003) theory in the effect of health-system level factors resulting in racial-ethnic healthcare disparities.

More emphasis was put on the elaboration of interpersonal- and intrapersonal-level processes, where the psychosocial factors play more crucial roles. *Unequal Treatment* (Institute of Medicine, 2003) analyzed the intrapersonal-level process separately for racial minority patients and non-minority physicians. For the racial minority patients, this work first noted that race-related attitudes and beliefs are accountable for the racial disparities in healthcare. Racial minority patients have tendency to seek health from racially concordant healthcare providers and tend to show less trust toward White physicians. This intense mistrust in both White physicians and the general medical care service is rooted in the traumatic history of racism in the Western society, which often results in their delay or avoidance to seek healthcare that they need. Secondly, the work highlighted the equally important role of social categorization, which is a process that underscores an individual's social identity that provides a basis for developing intergroup bias. In scenarios where racial minority patients have to interact with White healthcare providers, such intergroup encounters would elicit the patient's anticipation of prejudice or discrimination and results in stereotype threats. That is, the interactions with racially discordant healthcare providers are more likely to induce stereotype-confirming behaviors, such as lower willingness to provide certain information requested by the physicians or perform lower adherence to the treatment, that are deleterious to their opportunities of receiving equal treatment from medical services. Besides the stereotype threat, Penner et al. (2013) suggested that the salience of social identity can also influence racial minorities' decision-making regarding healthcare through their identity-based motivations. That is, according to the Identity-Based Motivation Model

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proposed by Oyserman et al. (2007), that individuals, when their social identity has been highlighted, tend to engage in typical behaviors that are shared with their ingroup members regardless of the consequences of such behaviors. Therefore, minority patients whose racial identity has been made salient in racially discordant encounters might tend to express more fatalism ideas regarding their health status and choose not to seek further treatments.

As for the non-minority physicians, Penner et al. (2013) have identified three main psychological processes that can lead to treatment disparities. First, the physician's racial stereotypes for individuals with specific demographic characteristics would be activated upon their encounter with the patient, inducing expectation about the patient's performance and adherence, which later influence their assessment and treatment decisions. Decisions made after the stereotype activation are often racially biased since physicians are likely to generalize their past experience of working with racial minority patients to the whole subpopulation, which leads to systematic disparities in treatment among racial-ethnic groups. Second, the contemporary racial bias, which refers to the implicit racism that are often not consciously recognized by the social actors themselves and result in discriminatory actions, can also be at work, especially when the working guidelines are ambiguous. For example, the pain of racial minorities patients is more likely to be undertreated than White patients. This disparity might be due to the lack of clear instruction regarding how to assess and treat pain in variety, in which case the healthcare provider's clinical decision are more likely to influenced by their stereotype of how patients with different racial-ethnic background would behave when in pain, hence racially biased (Green, 2003). Third, the cognitive load of healthcare providers also plays an important role in explaining the treatment bias. It is understandable that physicians need to process and analyze countless information and mental tasks during their work time. However, the drain of cognitive resources would escalate the probability of individuals to process and response in a rather automatic way, which is the way

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that requires least mental effort and are often associated with stereotypes that are deep rooted in one's cognition. The cognitive overload is especially overwhelming during racially discordant medical encounters since White physicians have to be particularly self-regulated to avoid any action that would be considered racist. Ironically, the shortage of cognitive resources due to cognition overload frequently led to clinical decisions that are racially biased.

Penner et al. (2013) then focused on the racially discordant physician-patient interaction to demonstrate how interpersonal level processes might further result in racial-ethnic healthcare disparities. Four factors have been identified in their discussion: social identity, divergent interaction goals, intergroup anxiety and stress, and implicit and explicit attitudes. First, social identity, as demonstrated in the discussion on intrapersonal level discussion, is made salient during interracial medical interactions. Both the racial minority patient and non-minority physician derive their self-image from their perceived social groups and strive to maintain positive social group images, which potentially result in ingroup favoritism and outgroup derogation that undermine the quality of medical interaction. Second, divergent interaction goals can exacerbate the interracial communication between patients and physicians. For instance, while non-minority physicians avoid appearing to be prejudiced, racial minority patients try to refrain from becoming targets of prejudice. Self-regulation efforts to manage these goals can drain cognitive resources, resulting in poor communication and negative post-visit feelings, particularly among minority patients, contributing to healthcare disparities. Third, as the social identity has been highlighted during racially discordant medical interactions, intergroup anxiety and stress can emerge upon the encounter. Such stress can cause individuals to perceive interactions as threats, resulting in hostile, withdrawn, or overcompensating behaviors, thereby reducing the quality of these interactions. Finally, physicians' explicit and implicit racial biases can independently and

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jointly affect the quality of racially discordant medical interactions, with explicit biases influencing deliberate behaviors and implicit biases influencing spontaneous, harder-to-control behaviors.

While the multilevel approach proposed by Penner et al. (2013) did elucidate more clearly how intra- and interpersonal psychological processes interfere the racially discordant interaction and can lead to racial-ethnic healthcare disparities, it mainly described medical encounters where racial minorities has taken the role of "patient" in the scenes. Such focus, despite delineating the complex power dynamic in racially discordant patient-physician relationships, has restricted their discussion to a certain dimension of healthcare disparities among racial-ethnic groups. Early demonstrations regarding the racial differences in the access, utilization, or experiences of healthcare has illustrated the multidimensionality of racial healthcare disparities, the socio-psychological approach proposed by Penner et al. is mainly dedicated to explaining the psychological mechanisms of racial-ethnic gaps in the experiences, such as the quantity and quality of medical communications, of healthcare. Meanwhile, the potential socio-psychological mechanisms that are responsible for racial-ethnic disparities in healthcare utilization remain unscrutinized. It needs to be highlighted that in the case of healthcare utilization, individuals do not necessarily take the patient role for utilization itself involves the decision-making of whether one should enter the health care facility or not. Hence, the responsible psychosocial mechanisms or factors of racial-ethnic healthcare disparities can be different from the ones noted in Penner et al.'s framework. In fact, there's been abundant empirical evidence that psychosocial characteristics, such as mental wellbeing, are correlated with one's healthcare utilization (Druss & Rosenheck, 1998; Druss et al., 2000; Dickerson et al., 2003; Capp et al., 2016). Though a consensus regarding the direction of association between one's psychological wellbeing and their healthcare utilization has not been reached in this strand of discussion, it does shed light on the fact that

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more general psychosocial factors have their impacts and might work as potential mechanism that explain for the racial-ethnic gaps in healthcare utilization. To fill in this intellectual gap, an alternative approach that expounds on the relationship between psychosocial factors and one's healthcare-related decision making as well as behaviors is needed for us to investigated what are the roles of psychosocial factors, possibly even more general ones that are not directly correlated with racial attitudes and discriminations, in the racial-ethnic disparities of healthcare utilizations.

2.3 Reserve Capacity Model

The Reserve Capacity Model (RCM), proposed by Gallo and Matthews (2003), might serve as a supplementary approach in investigating the mechanism of racial-ethnic disparities in healthcare utilization. This model was originally designed to extend beyond the fundamental cause theory (Link & Phelan, 1995) and to explain health disparities caused by the difference of socioeconomic status. Realizing the fact that health disparities cannot be simply explained by the difference of access to material resources, they highlighted the importance of mental capacity, which are supported by a series of psychosocial resources, as mediating mechanisms to achieve better health status. It was noted that people in bitter socio-economic environments not only are exposed to more life stressors but also response more intensely to negative events (Matthews et al., 2010). Moreover, people in lower SES are likely to live in more hostile neighborhoods, have less access to beneficial resources, and less likely to receive less social support (Gallo, 2003). Therefore, the comparatively frequent exposure to environmental stressors would hamper their capability in stress management and leads to more negative emotions, intense distress, and deficient cognition. The negative emotions and the cognitive deficit influence one's health behavior and physiological reactions, which would later exacerbate their health outcome.

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A series of empirical studies and review articles has been done to examine the mediating effect of different psychosocial variables (Gallo & Matthews, 2003; Gallo et al., 2005; Matthews et al., 2010). Later empirical studies also support that this model works in explaining health disparities in a wide range out health outcomes such as metabolic syndrome (Matthews et al. 2008), myocardial infarction (Bennett et al., 2015), and psychological health (You et al., 2021). Moreover, a culturally expanded model was of the health disparities caused by sociocultural factors other than SES. Race-ethnicity is one of the important factors that has been addressed in the expanded model (Gallo et al., 2009). Later research investigating the correlation between psychosocial factors and cognitive changes in the Latino elderly communities supports this expansion of reserve capacity model in explaining racial health disparities (Estrella et al., 2023).

While Penner et al.'s model and RCM do share their common focus on how psychosocial factors can serve as mechanisms in racial-ethnic health/care disparities, the two models have some essential differences which make the latter a good supplementary approach for the former in to unravel the potential pathways of racial-ethnic disparities in healthcare utilization. First, while Penner et al. focused on the roles of "patient" and "providers" in formal medical encounters, RCM regard their analytical subject generally as social actors. The roles and interaction scenarios are not specified in RCM, which gives the researchers the flexibility to explore health-related behaviors outside of the medical system. Second, while the two models share the terms used in their theories, the definitions differ across frameworks. In Penner et al.'s model, psychosocial factors refer to the cognitive process induced by racially discordant medical interactions. While the "intrapersonal-level processes" concern the inner experience and reasoning logic of both the racial minority patients and non-minority providers, the "interpersonal-level processes" refer to elements of their interaction process. In contrast, RCM described the psychosocial factors as a set of

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resilient resources that one can access or develop in their daily life and is beneficial in enhancing one's health behaviors. The perspective was more subject-centric: while the "intrapersonal factors" refer to an individual's internal experiences or psychological resources, such as emotions, stress experiences, personality traits, self-esteem, etc., the "interpersonal factors" describe beneficial interactive experiences or resources surrounding the social actor, such as social support, social integration, social competence, etc. (Gallo, 2009). In such sense, both the intrapersonal and interpersonal psychosocial factors in RCM are actually involved in the intrapersonal-level processes of the patients in Penner et al.'s model, for the psychological and social resilient resources can together shape one's cognitive process and lead to behavioral outcomes. Such alignment of these two models can be very helpful in addressing the racial-ethnic gaps in healthcare for RCM expands the original scope of Penner et al.'s model, which was limited to formal medical encounters, to general psychosocial resources experienced in everyday life.

While Gallo and their colleagues' works on the Latino communities have demonstrated that reserve capacity model can be useful in explaining racial disparities, we need more evidence to evaluate whether this framework works beyond the Hispanic population. More importantly, further research is needed to illustrate whether psychosocial resources are distributed and work differently across racial-ethnic groups since previous studies have inconsistent findings regarding the relationship between race-ethnicity and the psychosocial resources covered in this model. Take mental health, for example. The conflicting outcomes reported by past studies have demonstrated the complex relationship between race-ethnicity and mental health (Williams, 2018). On one hand, some researchers stressed that racial disparities also exist in mental health by demonstrating the higher prevalence of psychiatric disorders among Native Americans, higher risk of persistence and disability from mental illness among African Americans and Hispanic, and poorer

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psychological wellbeing among African Americans (Hughes et al., 2015). They have mostly attributed the worse mental health experienced by the racial-ethnic minorities to their inferior living and working conditions, as well as the racial discrimination they experience in daily life (Williams, 2018). On the other hand, scholars also found a counter-intuitive phenomenon that racial-minorities, especially African Americans, often have lower risk for psychiatric disorders (Breslau et al., 2006) and better mental health outcome (Barnes et al., 2013) than White people. This finding has been proved to be solid across gender, age, and psychiatric disorders (Kysar-Moon, 2019; Tobin et al., 2022). This is perplexing phenomenon has been considered as a "paradox" in the study of race and mental health, since the averagely inferior living circumstances and persistent racial discrimination are thought to result in more mental distress for the racial minorities.

Research on the relationship between race-ethnicity and social support also suffers from inconsistent findings. While some studies stressed that racial-ethnic minorities tend to receive lower level of social support and social service provided by the medical system or other institutions (Lee & Rispoli, 2017) and report lower level of perceived organizational support from their workplace (Pullen et al., 2023), other research argues racial minorities, especially ones from collective cultures, receive more social support from their family members as well as friends and are benefit from these supportive social relationships to achieve better health outcomes (Mulvaney-Day et al., 2012; Steers et al., 2019).

One thing to be noted from the inconsistent outcomes is that different psychosocial resources, even different dimensions of certain factors, might be distributed or work differently across race-ethnic groups. Therefore, it is important that we reevaluate the reserve capacity model under the context of racial healthcare disparities to understand how different intra- and interpersonal psychosocial resources as the mediating mechanisms that improve or hinder one's healthcare utilization behaviors. In this case, we might be able to take the

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conflicting findings not only as empirical paradoxes but also leverages to intervene in the healthcare disparities.

3. Theoretical Framework and Hypothesis

Based on the previous discussion, the current research intends to expand the reserved capacity model to investigate whether psychosocial resources serve as pathways between individuals' racial-ethnic background and their healthcare utilization. The original framework of RCM is shown in Figure 1. In contrast to the original RCM, which focuses on health status as the main outcome, my interest lies in examining whether the mediating effect of psychosocial factors—more accurately referred to as 'psychosocial resources' based on Gallo and Matthews' definition and distinct from Penner et al.'s model—persists when considering health behaviors, specifically healthcare utilization in this study, as Gallo and Matthews proposed in their theoretical model (2003).

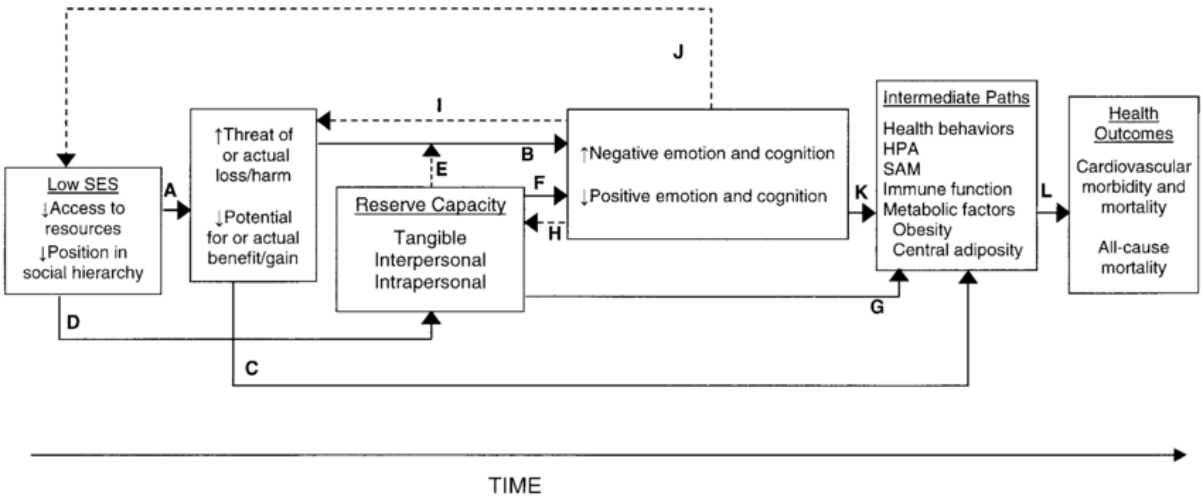

Figure 1. The original theoretical framework of the Reserved Capacity Model.

Adapted from "Understanding the association between socioeconomic status and physical health: Do negative emotions play a role?", by L. C. Gallo and K. A. Matthews, 2003, *Psychological Bulletin,* 129(1), p. 34. Copyright 2003 by the American Psychological Association.

doi:10.6342/NTU202500318

To investigate whether psychosocial resources serve as the intermediate pathway is to examine whether they mediate the correlation between race-ethnicity and healthcare utilization. Following the guideline in testing mediations (Baron & Kenny, 1986; See also MacKinnon & Dwyer, 1993), one must ensure that (1) X has a direct effect on Y, (2) X has a direct effect on M, and (3) M has a direct effect on Y. Once all three conditions have been fulfilled, one can move on to test whether the indirect effect from X through M to Y is statistically significant. If the indirect effect has been tested to be significant, then we can say that M mediates the correlation between X and Y, partially or entirely depending on the percentage of mediation. To clearly demonstrate how the variables of interest should be incorporated in the framework of mediation analysis, I visualize the relationship among race-ethnicity, psychosocial resources, and healthcare utilization in Figure 2.

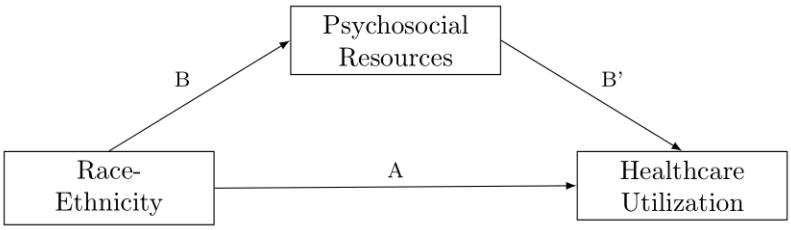

Figure 2. The theoretical framework of the current research.

Arrow A refers to the direct correlation between one's racial-ethnic background and their healthcare utilization, which tests whether X has a direct effect on Y. As covered in the literature review, there has been rich evidence supporting the direct correlation between race-ethnicity and healthcare. However, I'd like to reexamine the established correlation specifically with healthcare utilization as the main outcome. Previous discussion suggests that racial-ethnic minorities have restricted access to flexible resources, they might be more likely to suffer from disparities in healthcare (Phelan & Link, 2015). To evaluate whether the racial disparities exist in healthcare utilization, I propose my first hypothesis of the study:

doi:10.6342/NTU202500318

Hypothesis 1: Racial minorities, when compared to their white counterparts, have poorer healthcare utilization behaviors.

Arrow B and B', which speak to the reserve capacity model, are the main pathways I'll be examining in this study. Arrow B is the correlation between one's racial-ethnicity background and their psychosocial characteristics, and Arrow B' stands for the correlation between psychosocial resources and healthcare utilization. To fulfill the three premises of mediation, I'll be testing these two pathways separately. Following the logic of reserved capacity model that the social and mental capacities are usually more restrained due to the constant exposure to environmental stressors, and the reserved capacity can hamper one's health-enhancing behaviors, I then propose Hypothesis 2 and 3:

Hypothesis 2: Racial minorities, when compared to their white counterparts, have poorer psychosocial resources.

Hypothesis 3: Individuals with less psychosocial resources are less likely to utilize healthcare they can access.

Once the X-Y, X-M, and M-Y relationships have been established, I can then move on to test the role of psychosocial resources in the framework. That is, whether psychosocial resources serve as the mediator between race-ethnicity and healthcare utilization. The significance of the indirect effects among race-ethnicity, psychosocial resources, and healthcare utilization, which is pathway B-B', will be examined to verify the mediating role of psychosocial resources. I therefore propose the third hypothesis of the study:

Hypothesis 4: Psychosocial resources significantly mediate the relationship between race-ethnicity and healthcare utilization, and the significance is consistent across racial-ethnic groups.

4. Data & Method

doi:10.6342/NTU202500318

4.1 Data

National Longitudinal Survey of Youth 1997 (NLSY97), which is a national representative longitudinal cohort study that following the lives of 8,984 people born in the United State between 1980 and 1984, is used for the analysis. The database was chosen for two reasons: (1) its wide coverage of topics provides abundant information regarding one's background characteristics, mental and physical wellbeing, and their health behavior simultaneously; (2) its panel design allows me to track the pattern of respondents' health behavior across time.

NLSY97 has far released in total 19 rounds of interview data. I included rounds consistently included information regarding the respondents' mental health, stress experiences, social support, and healthcare utilization simultaneously will be included in the analysis, which are the surveys from 2005 to2009. Only respondents who are African American, Hispanic, or Non-Hispanic White are included in the analysis for theoretical purpose. Respondents who have not consistently participated in survey during the specified period are also not included in the sample. There are 4,109 respondents (i.e. groups of observations) and 20,545 person-year observations in the final analytical sample. The analytical sample will not be weighted since the main intention of the current research is to unravel the utilization gaps between racial-ethnic groups but not to depict the behavioral tendency of the whole population.

4.2 Measurement

Healthcare Utilization There are mainly two items in NLSY asking about the respondent's healthcare utilization, which are "During the past 12 months, how many times were you

doi:10.6342/NTU202500318

injured or ill and had to be treated by a doctor or nurse?[1]" and "During the past 12 months, how many times were you injured or ill so that you missed at least one full day of usual activities such as work or school, but were not treated by a doctor or nurse?". In other words, these two items measured the reported times of when the respondent feel the need of healthcare and were treated or not treated by their healthcare providers (0= "Never", 1= "One time", 2= "Two times", 3= "Three times", 4= "Four times or more"). I first summed up the two variables to construct a measure of the respondent's total perceived needs of healthcare. Scrutinizing whether racial-ethnic gaps exist in the respondent's perceived needs of healthcare utilization helps to understand that for equally healthy individuals, do racial-ethnic background impact their awareness of their needs of healthcare. Such evaluation is important for the healthcare awareness determines their decision-making on healthcare seeking behaviors. Also, evaluating whether there's a difference in needs of healthcare among racial-ethnic groups might provide some answer to the "overuse" hypothesis noted in *Unequal Treatment*. Then I went on to investigate if there's also a racial-ethnic gap in their healthcare utilization behaviors with the times of they received treatment as the outcome. The total perceived healthcare needs will be controlled for in models where the number of times treatment was received when needed serves as the outcome, allowing the results to reflect whether their healthcare needs have been fulfilled by their utilization behavior.

Psychosocial resources: Following the framework of RCM, two sets of psychosocial resources, which are the intrapersonal and interpersonal factors, will be examined as mediators in the current study.

(1) Intrapersonal factors: Two variables served as the proxies of the respondent's psychological capacity which can influence their health behaviors.

[1] I have confirmed with NLS User Service that this question intends to measure as number of times in past 12 months the respondent was injured/ill and treated by a doctor or nurse.

doi:10.6342/NTU202500318

First, a short depression scale serves as the measurement of the respondents self-reported mental health status. The scale was constructed with five items, including how often has the respondent been a nervous person, been a happy person, felt calm and peace, felt down or blue, and felt depressed in the past month. The items were originally measured with four points of frequency (0= "None of the time", 1= "Some of the time", 2= "Most of the time", 3= "All of the time"). I reverse-coded the question asking how often the respondents has been a happy person and felt calm and peace, then summed up the values of the five items to construct an index with a maximum value of 15. Higher value in the depression scale suggests that the respondent tend to experience the emotional distress more often. The items asked for the respondent's self-report depression in the past month, which is the month before the time of the interview. Therefore, for the purpose of establishing the time order in causal mediation, I will be using the respondent's report of depression in the n-1 wave to test the effect of depression on healthcare utilization[2].

Second, an index was constructed regarding the stressful life events that the respondents had experienced to understand the mental distress they might be bearing. The index consist of seven dichotomous items, including whether the respondent has experienced decease of close relatives, has been a victim of any violent crime, has been homeless or living in an emergency or transitional shelter for more than two nights, has had a member in their household being hospitalized for more than one week, has had an adult member in their household being incarcerated, has had an adult member in their household being unemployed for

[2] This would reduce the numbers of observation in models where depression score is included since there are only three waves of answers on this variable.

doi:10.6342/NTU202500318

six months or more, and if their parents are divorced. I summed up response value (0= “No”, 1= “Yes”) of these items and construct an index with the total sum of 7. People with higher points in the index suggest that they’ve experienced more stressful life events.

(2) Interpersonal factors: five variables served as proxies of the respondent’s social capacities that can influence their health behaviors. Past research using RCM have explored the effects of social support e.g. one’s connection with their family and friends, whether they lived alone, etc. (Gallo et al., 2009; Matthews et al., 2010) as well as of institutional support e.g. support from their workplace (Gallo, 2009). The current study will examine both types of support and measure them with multiple variables: the respondent’s marital status and living arrangements serve as proxies of social support, while whether the respondent have paid sick leaves from their employers and primary health insurance provided by a plan sponsor are the indicators if institutional support.

The *marital status* of the respondents has been collapsed and dichotomously recorded (0= “Currently not married”, 1= “Married”), so did the two measurements of their living arrangements i.e. whether the respondent was *living alone* (0= “No”, 1= “Yes”) and whether they were *living with any kinship* (0= “No”, 1= “Yes”). All three of these variables were used to capture whether having legal bond with or simply the physical presence of significant others serves as protective social resources that can enhance one’s healthcare seeking decisions and behaviors.

The total days of paid sick leaves reported by the respondent were also recoded as a binary variable of *whether one has any paid sick leaves from their workplace* (0= “No”, 1= “Yes”). Having paid sick leaves suggest that the

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employer realize the needs of their employees to seek care when injured or ill and willing to support them, therefore should foster one's healthcare utilization. The *source of the respondent's health insurance* has been recorded as three dummy variables: whether the respondent's primary health insurance is provided by a plan sponsor (i.e. their own current or previous employer, their family's or partner's current or previous employer, the institution they were affiliated to, or governmental insurance plan like Medicare or Medicaid), self-bought[3] or no health insurance. Having a plan sponsor suggest that the individual is benefit from the institutional design of their workplace or the institution they're affiliated to and therefore should enhance one's capacity of utilizing accessible healthcare when needed.

Racial-ethnic background: NLSY has a measure of race (1= "White", 2= "Black or African American", 3= "American Indian, Eskimo, or Aleut", 4= "Asian or Pacific Islander", 5= "Something else?") and ethnicity (whether the respondents is Hispanic, 0= "No", 1= "Yes"). The current study majorly concerns the healthcare disparities between Non-Hispanic White and African American as well as Hispanic for theoretical purpose. Therefore, the two measurements will be combined and collapsed into two binary variables: whether the respondent is African American (0= "No", 1= "Yes"), and whether the respondent is Hispanic[4] (0= "No", 1= "Yes"). These two binary measurements will be included in the models separately to demonstrates the potentially divergent effect of race-ethnicity for individuals from different racial-ethnic background share different culture in regards of protective psychosocial resources and health attitudes (Gallo et al., 2009).

[3] The self-bought dummy variable is not included in the logistic regression models where the probability of having primary health insurance provided by a plan sponsor since it would unbalance the sample size. However, it is included when the source of health insurance serve as the mediator (i.e. one of the independent variable) in the models.
[4] Including both Hispanic Black and Hispanic White.

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Covariates: Socioeconomic characteristics other than race-ethnicity that might influence individual's insight and behaviors of healthcare utilization are controlled in the models (Fylkesnes, 1993; Geitona et al., 2007). Including the respondent's gender (0= "Male", 1= "Female"), the respondent's age in the survey year, education attainment (measured as years of education, Max=20), and socioeconomic status (measured as the logged gross household annual income), whether the respondent resides in rural area (0= "No", 1= "Yes") , whether there's any time that the respondent does not have medical coverage in the past year[5] (0= "No", 1= "Yes"; people with no health insurance in the first place were treated as "Yes"), and whether the whether the respondent has ever received any diagnosis of chronic conditions (0= "No", 1= "Yes")

4.3 Analytical Strategy

This study is conducted in two stages: a multilevel non-linear regression analysis and a multilevel regression-based mediation analysis. In both stages, African American and Hispanic groups are evaluated in separate models, with Non-Hispanic Whites serving as the reference group. This decision was driven by methodological and theoretical considerations.

Methodologically, the multilevel mediation analysis model was designed to work binary independent variables (Krull & MacKinnon, 2001), which presented two options: treating all racial-ethnic minorities as a single group (i.e., creating one variable to identify respondents as either Non-Hispanic White or Racial-Ethnic Minority) or comparing each minority group separately with Non-Hispanic Whites (i.e., creating two dummy variables to identify whether a respondent is African American or Hispanic).

[5] This covariate will be omitted in multilevel nonlinear regression models that include the source of the respondent's primary health insurance plan due to the issue of collinearity.

doi:10.6342/NTU202500318

While both operationalizations were viable, I consider it more theoretically appropriate to examine the psychosocial resources and healthcare utilization separately for African American and Hispanic. As the preceding literature suggested, African Americans and Hispanics, while both considered racial-ethnic minorities, exhibit distinct patterns in the psychosocial factors addressed in the current study. Therefore, examining these two racial-ethnic groups in different model would help to add the nuance to studies in racial healthcare disparities by unravelling the heterogeneous distribution and mediating effects of psychosocial resources across racial-ethnic minority groups.

In the first stage, I test Hypothesis 1 to 3, which are the ones regarding the direct correlation between variables of interest, by conducting random-effect non-linear regression analysis. The random-effect model is used here for addressing the effects of individual-clustered time varying variables. For Hypothesis 1, I test the direct correlation between race-ethnicity and healthcare utilization, while adjusting for the covariates. For tests with count variables as outcomes, which are the total reported times that the respondent considered they need healthcare when injure or ill and times that the respondent did the healthcare provider when feeling needed, Poisson[6] regression will be used for analysis. The equation can be denoted as below:

$$\log(\theta_{it}) = \alpha_0 + \alpha_1(Race\text{-}ethnicity)_i + \sum_{k=3}^{8} \alpha_k x_{ikt} \quad (1)$$

where for respondent i at time t, $\log(\theta_{it})$ is the log counts of their self-reported healthcare utilization and α_0 is the intercept. α_1 is the direct effect of the respondent's racial-ethnic

[6] While both variables showed a distribution of over-dispersion, negative binomial regression model cannot converge when the total need of healthcare is controlled. In such cases, Poisson regression, which is helpful in relaxing the data, will be used for analysis. Results of negative binomial will be reported in the supplement to support the results of Poisson regression.

doi:10.6342/NTU202500318

background on their needs and behavior of healthcare utilization. x_{ikt} stands for a vector of control variables where $\sum_{k=3}^{g} \alpha_k$ measures the total effect of covariates.

As for Hypothesis 2, the direct relationship between race-ethnicity and psychosocial resources are examined by linear and logistic regression models. For tests with mental health score and experienced stressful events as outcome, linear regression models will be used. The equation can be denoted as below:

$$y_{it} = \beta_0 + \beta_1(Race\text{-}ethnicity)_i + \sum_{k=3}^{8} \beta_k x_{ikt} \quad (2)$$

where for respondent i at time t, y is the score of the respondent's mental health or experienced stressful β_0 is the intercept. β_1 is the direct effect of the respondent's racial-ethnic background on the outcomes. $\sum_{k=3}^{g} \beta_k$ measures the total effect of the vector of the covariates x_{ikt}. As for the models with binary outcomes, logistic regression models will be used, and the equation can be denoted as below:

$$\log\left(P(y_{it})\right) = \beta_0 + \beta_1(Race\text{-}ethnicity)_i + \sum_{k=3}^{8} \beta_k x_{ikt} \quad (2)$$

where for respondent i at time t, $log\ (P(y_{it}))$ is the logistic value of probability where respondent reported y=1. β_0 is the intercept, and β_1 is the direct effect of the respondent's racial-ethnic background on the outcomes. $\sum_{k=3}^{g} \beta_k$ measures the total effect of the vector of the covariates x_{ikt}.

To test Hypothesis 3, psychosocial resources are added to the model to examine if psychosocial resources have significant effect on healthcare utilization when race-ethnicity is also shown in the model. For tests with count variables as outcomes, negative binomial regression will be used for analysis. The equation can be denoted as below:

$$\log(\theta_{it}) = \gamma_0 + \gamma_1(Race\text{-}ethnicity)_i + \gamma_2(Psychosocial\ Factors)_{it} + \sum_{k=3}^{8} \gamma_k x_{ikt} \quad (3)$$

doi:10.6342/NTU202500318

where for respondent i at time t, $\log(\theta_{it})$ is the log counts of their self-reported healthcare utilization and α_0 is the intercept. γ_1 is the direct effect of the respondent's racial-ethnic background on their needs and behavior of healthcare utilization. γ_2 is the coefficient of interest here, which is the direct effect of psychosocial resources on healthcare utilization. x_{ikt} stands for a vector of control variables where $\sum_{k=3}^{g} \alpha_k$ represents the total effect of covariates.

Hypothesis 4 is tested in the second stage, which is the mediation analysis, to determine whether psychosocial resources can serve as mediators between race-ethnicity (or to be considered as the exposure in the context of mediation analysis) and healthcare utilization (i.e. outcomes). To determine the mediating effect of mediator M between exposure X and outcome Y, the following three conditions must be satisfied: (1) X has a direct effect on M, (2) M has a direct effect on Y when X is controlled for, and (3) an indirect effect from on X through M to Y is present (i.e. statistically significant) (Baron & Kenny, 1986; MacKinnon & Dwyer, 1993). The test of Hypothesis 2 and 3 in the first stage can help to identify which psychosocial factor fulfilled the first and second premises. Thus, in the second stage, the major goal is to examine whether the indirect effects from race-ethnicity through the identified psychosocial resources to healthcare utilization are statistically significant.

Due to the panel nature of NLSY97 data, analytical models in the current study need to be able to capture the clustered error of time-variant observations within respondent. This issue can be dealt with in the first stage by employing random-effect regression models. In the past, most researchers adopted structural equation models (SEM) to conduct mediation analysis with longitudinal data (Cole & Maxwell, 2003). However, the models are usually rather complex and cumbersome. Since the direct relationship between X, M, and Y in the first stage of analysis has been tested in the first stage and main mission of the current study

doi:10.6342/NTU202500318

is to identify mediating pathway through psychosocial resources, it would be more ideal to find a regression-based model that can utilize the known information and focus on testing the indirect effects.

Hence, I adopt the multilevel model of mediation analysis proposed by Krull and MacKinnon (2001), which is a regression-based model capable of identifying the mediating effect of variables at different levels. The multilevel mediation model was designed to address the issue of standard errors of mediating effects in clustered data, which cannot be examined with single-level mediation analysis. While this model seems ideal for the current study, a major concern must be addressed: Krull and MacKinnon's model was designed to work with continuous mediators and outcome variables and to perform calculations using linear regression models. However, this is not the case for my study, as most of my variables of interest are either binary or count variables that are better examined with nonlinear regression models. Despite this, I believe the multilevel mediation model can still be useful since the direction and significance of relationships among variables are mostly consistent across linear and nonlinear regression models[7]. Therefore, I consider the indirect effects identified by the multilevel mediation model to be informative, as the main goal of the current study is to identify the presence of mediating effects.

The current study intends to examine the indirect effect of an individual-level predictor (i.e. race-ethnicity, which is time-invariant) through time-level mediators (i.e. psychosocial resources that are time-variant) to time-level outcomes (i.e. needs and behaviors of healthcare utilization, which are also time-variant), which applies to the 2-1-1 model depicted by Krull and MacKinnon. The mediating effect will be the product of the direct

[7] In case where the significance of correlation is inconsistent across linear and nonlinear models, results of nonlinear model serves as the standard to decide whether the correlation is statistically significant. The results of multilevel linear regression are demonstrated in Appendix.

doi:10.6342/NTU202500318

effect of X on M and direct effect of Y on M when controlling for X, which is theoretically the product of β_1 from equation 2 or 3 and γ_2 from equation 4. However, since the multilevel mediation model examines all the correlations with OLS, the values of the indirect effects will not be $\beta_1\gamma_2$ but instead the product of correlations of X-M and M-Y when both the mediators and the outcome variables are treated as continuous variables. Since the coefficient can differ across models, I therefore will be focusing on the direction and significance of the indirect effects for the main purpose of the current study is to identify the presence of the mediating effects.

5. Results

5.1 Descriptive Statistics from 2005 to 2009

The descriptive statistics that of responses from survey year and the whole analytical sample are shown in Table 1. There is a total of 20,545 person-year observations in the analytical sample. Of this sample, 54.6% are Non-Hispanic White, while approximately a quarter of the respondents are African American (24.1%) and Hispanic (21.3%), respectively. 47.5% of the respondents are male, and 52.5% are female. On average, respondents reported feeling the need to be treated by a doctor or nurse approximately 1.5 times in the past year but received treatment from a healthcare provider less than once (0.695). The respondents' ages ranged from 21 to 29 during the period, suggesting that this analysis depicts the behavioral patterns of individuals in their early adulthood. The average score for depression is approximately 4.428 out of 15, and respondents experienced averagely fewer than one type (0.763) of stressful life event, suggesting that most respondents bear rather low mental distress. The average percentage of respondents who were married was around 25%, but it can be observed that the percentage increased consistently over the period and reached 31.8% at 2009. 10.71% of the respondents were living alone during the survey, while more than

doi:10.6342/NTU202500318

80.67 % were living with a kinship. Averagely, 48.27% of the respondents had paid sick leave provided by their employers, but this percentage grew throughout the period, eventually reaching above 55% in 2009. Finally, more than 67% of the respondents had a primary health insurance plan sponsored by their employer, while slightly less than 30% had no health insurance at all, and 3.47% purchased their own primary health insurance.

5.2 Stage 1: Multilevel Linear Regression

5.2.1 Race-ethnicity and Healthcare Utilization

I first examined the direct relationship between the respondent's race-ethnicity and their perceived needs and behaviors of healthcare utilization. The regression results for African American and Hispanic, both with Non-Hispanic White serving as the reference group, are shown separately in Table 2 and 3. In Table 2, it can be observed that being African American is associated with 0.312 decrease in log counts of total needs of healthcare. This negative correlation presents when the respondent's physical health has been controlled in the model, suggesting that given similar physical condition, African Americans might be less likely consider themselves need health care when sick or injured. The results also showed that respondents who are female, reported higher household income, and have received diagnosis of chronic disease also significantly reported more perceived healthcare needs. In contrast, those who are older or have once lost their insurance in the past year tend to report significantly less perceived needs of healthcare.

However, while the total needs were controlled, the results suggest that the behaviors of healthcare utilization also differ between these two race-ethnicity groups. Being African Americans, when comparing to their Non-Hispanic White counterparts, is statistically significantly associated with 0.143 decrease in log counts of times of treated

doi:10.6342/NTU202500318

by healthcare providers when needed. In other words, when African Americans were sick or injured and sensed the need of treated by healthcare providers, they are less likely to utilize healthcare they can access and receive the treatment they need. The results also showed that respondents who are female, had been diagnosed of chronic disease, and reported more total perceived healthcare needs are significantly more likely to seek healthcare service when ill or injured. On the other hand, those who are older or had lost their insurance once in the past year reported significantly less times of treated when need.

The results in Table 3 suggest that the same case applies to Hispanic. When comparing to Non-Hispanic White, being Hispanic is significantly associated with 0.288 decrease log counts of total needs of healthcare and 0.149 decrease in log counts of times of treated by healthcare providers when needed. Table 3 also demonstrate similar findings in Table 2 that female and respondents diagnosed with chronic disease reported significantly more perceived healthcare needs and more likely to seek treatment when ailing. Also, those who are older and had once lost their insurance in the past year reported significantly less perceived healthcare needs and less to seek treatment when need.

Overall, the results suggest that racial disparities in the needs and behaviors of healthcare utilization. Specifically, racial-ethnic minorities perceive significantly fewer needs of healthcare and are less likely to utilize healthcare services they can access when needed. Hypothesis 1 is therefore supported.

5.2.2 Race-ethnicity and Psychosocial Resources

The direct relationships between the respondent's race-ethnicity and their intrapersonal as well as their interpersonal psychosocial resources are then examined. The regression results are shown in Table 4 and 5 for African American and Hispanic, with

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Non-Hispanic White as their reference group, separately. Table 4 has demonstrated that comparing to Non-Hispanic White, African American have experienced significantly more stressful life events and are less likely to be married as well as to own insurance provided by plan sponsors. While these results imply that African American tend to have poorer psychosocial resources, the lower score of depression, higher probability of living with kinship, and more likely to be working a job with paid sick leave suggest otherwise.

Meanwhile, results in Table 5 suggests that race-ethnicity seems to have a more consistently positive correlation with psychosocial resources for Hispanic respondents. When compared to their Non-Hispanic White counterparts, Hispanic respondents tend to report significantly lower level of depression, lower tendency to be living alone, more likely to be living with their kinship, and more likely to be working a job with paid sick leaves. However, like African American, they are also less likely to have insurance plan that are provided by plan sponsors.

Respondent with different sociodemographic characteristics also shows different advantages and lack in psychosocial resources. In both Table 4 and 5, it can be observed that female respondents, when compared to male respondents, reported significantly higher level of depression. They are also more likely to be married and living with kins, and less likely to be living alone. Moreover, they are significantly more likely to have primary health insurance provided by a plan sponsor. Age is also correlated with some of the psychosocial resources. Respondents who are older reported significantly more stressful experiences. They are also more likely to be married, living with kins, have paid sick leaves, and primary health insurance provided by a plan sponsor.

The respondents' socioeconomic backgrounds are also correlated with their psychosocial resources. For instance, it can be observed in both Table 4 and 5 that respondents with higher education achievement reported significantly lower levels of

doi:10.6342/NTU202500318

depression and are less likely to be living with kins. They are also more likely to live alone, have paid sick leaves, and sponsored health insurance. Those who reported higher household income are also more likely to have sponsored health insurance. Such results suggest that individuals with higher socioeconomic backgrounds might be more likely to enjoy employee benefits that ensure their health. One's residency would also influence their interpersonal resources. Table 4 and 5 demonstrate that respondents who reside in rural areas are more likely to be married and living with kins, and less likely to be living alone.

Finally, one's insurance status and physical health can also influence one's psychological wellbeing. Table 4 and 5 consistently show that respondents who have once lost their insurance in the past year or are diagnosed with chronic disease reported significantly higher levels of depression.

The findings suggest that the relationship between race-ethnicity and psychosocial resources might be rather complex than the RCM proposed. The correlation is not monotonic and differs not only by types of psychosocial resources but also across racial-ethnic groups. For African American, the significantly more experiences of stressful life events and lower probability of being married suggest that they experience more psychological distress and less likely to receive social support from romantic partner than Non-Hispanic White. However, the lower depression score, higher tendency of living with kinship and owning a primary insurance plan provided by a plan sponsor suggest otherwise. As for Hispanic respondents, the significantly lower level of depression suggest that they experience less psychological distress. The lower tendency to be living alone and higher tendency to be living with their kinship suggest that their living arrangement can provide more social support when they are in need. Also, the higher tendency of working a job with paid sick leaves notes that they are receiving institutional

doi:10.6342/NTU202500318

support from their workplace. Meanwhile, the lower probability of them having insurance provided by a plan sponsored suggests that they lack institutional support in other dimensions. Hence, I consider Hypothesis 2 to be partially supported by the evidence in my analysis.

5.2.3 Psychosocial Resources and Healthcare Utilization

The regression results of the correlation between psychosocial resources and healthcare utilization when the respondent's racial-ethnic background being controlled are shown in Table 6 and 7. This is the last premise that needs to be established for the psychosocial resources to serve as valid mediators between race-ethnicity and healthcare utilization.

In table 6, it can be observed that for African Americans, when compared to their Non-Hispanic White counterparts, the score of depression, stressful experiences, whether one is working a job with paid sick leave leaves, and the source of insurance plan are significantly correlated with the respondent's total needs of healthcare. The significantly positive correlations suggest that respondents with higher level of depression, more experiences of stressful life events, working a job with paid sick leaves and having insurance plan provided by a plan sponsor tend to report more perceived needs of healthcare. Meanwhile, the respondent's marital status and their living arrangements are not significantly associated with their needs of healthcare.

The association between paid sick leave and healthcare utilization dissipated when the behavior of healthcare utilization serves as the outcome. Table 7 demonstrates that the score of depression, stressful experiences, and insurance provided by plan sponsors are significantly correlated with one's healthcare utilization behaviors. Respondents with higher scores of depressions and more stressful experiences have more times of being treated by healthcare providers when needed. Meanwhile, respondents with primary

doi:10.6342/NTU202500318

health insurance provided by a plan sponsor are more likely to go to their providers when perceiving healthcare needs.

In general, the results suggest that for African American, intrapersonal psychosocial resources as well a certain type of interpersonal psychosocial resources, which is the institutional support from their workplace, are significantly correlated with their needs and behaviors of healthcare. However, the patterns of association do not entirely follow the assumption of reserved capacity model, which hypothesizes that more psychosocial resources are correlated with better health behaviors. Having insurance provided by a plan sponsor, which is considered as institutional support from workplaces, does seem to foster one's healthcare utilization behaviors. However, respondents that experience more mental distress, who are considered to have reserved capacity, are also more likely to seek help from healthcare providers when needed. Overall, the results suggest that the relationship between psychosocial resources and healthcare utilization might be more complex than assumed in the reserved capacity model, Hypothesis 3 is therefore only partially supported here.

The results in Table 8 and 9 suggest that the relationships between psychosocial resources and healthcare utilization differ across racial-ethnic groups. Results in Table 8 psychosocial resources and healthcare utilization showed similar association patterns for African American and Hispanic, when compared to Non-Hispanic White. That is, the score of depression, numbers of experienced stressful life event, paid sick leave from employer, and the source of insurance plan are significantly and positively correlated with total needs of healthcare. Respondents who are more depressed, have more stressful experiences, have paid sick leave from work and have insurance plan provided by a plan sponsor tend to report more times of total perceived needs of healthcare.

doi:10.6342/NTU202500318

Table 9 suggests that only the respondent's stressful experiences and the source of their insurance plan are significantly correlated with their behaviors of healthcare utilization. The positive associations in Table 9 suggest that respondents who have experienced more stressful life events and those who have health insurance plans provided by a plan sponsor would be more likely to utilize healthcare when needed.

Like what we observed in the analysis focused on African American and Non-Hispanic White, it can be generally concluded that intrapersonal psychosocial resources and institutional support from workplace are significantly correlated with the respondent's total perceived needs of healthcare. However, the results suggest that the relationship between psychosocial resources and healthcare utilization might not be necessarily positive as depicted in the reserve capacity model. While one can benefit from institutional support such as primary health insurance provided by a plan sponsor and utilize accessible healthcare more actively, intrapersonal factors such as stressful experience that considered to hamper one's psychological capacity in the context of RCM can also enhance the respondent's healthcare utilization. The contradicting results only partially support Hypothesis 3. Nevertheless, I can proceed to examine the mediating effect of intermediate variables that are significantly correlated with the race-ethnicity and healthcare utilization regardless of the direction of association for they have satisfied the premise of mediation.

5.3 Stage 2: Multilevel Mediation Analysis

In stage 2, I demonstrated the estimate of natural direct effect, natural indirect effect, and the total effect of the triangular relationship among racial-ethnic backgrounds, psychosocial resources, and healthcare utilization. Likewise in Stage 1, African American and Hispanic will be evaluated separately, but both with Non-Hispanic White serving as the

doi:10.6342/NTU202500318

reference group. The indirect effects of different psychosocial resources will also be examined separately to make sure that they don't block each other on the pathways.

As established in the earlier discussion, a variable serves as a mediator only when (1) X has a direct effect on M, (2) M has a direct effect on Y, and (3) The indirect effect from X through M to Y must be present, which means to be statistically significant. Regression in the first stage of analysis is helpful in checking whether the first two conditions are satisfied. The regression results suggest that (1) For African American, the respondent's race-ethnicity is have significant direct correlation with their depression, stressful experiences, marital status, whether one's living with their kinship, whether they work a job with paid sick leaves, and whether they receive insurance plan provided by a plan sponsor; For Hispanic, the respondent's race-ethnicity is have significant direct correlation with their depression, whether they are living alone, whether they are living with their kinship, whether they work a job with paid sick leaves, and whether they receive insurance plan provided by a plan sponsor. (2) When African Americans and Non-Hispanic White are included in the analytical sample, the respondent's depression, stressful experiences, whether they work a job with paid sick leaves, and the source of their primary health insurance are significantly correlated to both their needs healthcare utilization. The effect of paid sick leaves vanished when the times of treated serve as the outcome, while the significance of other three variables remain; When Hispanic and Non-Hispanic White are included in the analytical sample, the respondent's depression, stressful experiences, whether they work a job with paid sick leaves, and the source of their primary health insurance are significantly correlated to their needs of healthcare, while stressful experiences and the source of primary health insurance are significantly correlated to their behaviors of healthcare utilization. Table 10 demonstrates which ones of the psychosocial resources can serve as valid mediators and will be examined in multilevel mediation analysis.

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To summarize, the potential mediators between race-ethnicity and perceived needs of healthcare utilization that satisfied the previous two conditions are depression, stressful experiences, paid sick leaves, and the source of primary health insurance for African American, and depression, paid sick leaves, ad source of primary health insurance for Hispanic; the potential mediators between race-ethnicity and times of treated by healthcare providers when needed are depression, stressful experience, and source of primary health insurance for African American, and source of primary health insurance plan for Hispanic. I proceed with the analysis by examining the significance of the indirect effect from race-ethnicity to their healthcare utilization through the potential mediators and evaluate the percentage of mediation.

Table 11 shows the results of mediation analysis of intermediate variables between racial-ethnicity and total perceived needs of healthcare for African American, with Non-Hispanic White serving as the reference group. The significance of indirect effect suggested that stressful experiences, paid sick leaves and source of primary health insurance plan serve as valid mediators between the respondent's racial-ethnic background and their needs of healthcare. However, they worked differently as mechanisms, and the connotation of the results should be deliberated with the previous information I gathered from the regression analysis.

The indirect effect through stressful experience and whether one is working a job with paid sick leave are significantly positive, suggesting that they both serve as mediators between the African American's racial-ethnic background and their perceived needs of healthcare utilization. The positive indirect effect through stressful experience and paid sick leaves suggested that since African American have averagely experienced more stressful life events and more likely to be working a job with paid sick leaves than Non-Hispanic White, which would increase their average perceived needs of healthcare utilization. This positive

doi:10.6342/NTU202500318

indirect effect on perceived needs of healthcare utilization, however, is only partial and cannot change the overall negative trend that African American tend to report less perceived needs of healthcare.

Meanwhile, it's been established in stage 1 that previous section that African Americans are less likely to have primary insurance provided by a plan sponsor, and having a plan sponsor would increase the report of perceived needs of healthcare. Therefore, the significantly negative indirect effect here suggested that being African American is associated with a decreased needs of healthcare through its negative correlation with having primary health insurance provided by a plan sponsor.

Table 12 demonstrates the mediation analysis results of intermediate variables between racial-ethnicity and total perceived needs of healthcare for Hispanic, with Non-Hispanic White serving as the reference group. It can be observed that the indirect effect through depression, whether one's working a job with paid sick leave, and whether their primary insurance is provided by a plan sponsor serve are statistically significant, suggesting that these three variables serve as valid mediators between racial-ethnic backgrounds and perceived needs of healthcare utilization for Hispanic.

Much like African American, Hispanic have negative indirect effect through depression and source of primary insurance plan. As established earlier, both of these two variables are positively correlated with the perceived needs of healthcare utilization. Thus, since Hispanic have averagely lower scores of depressions and less likely to have primary health insurance plan provided by a plan sponsor, they tend to report less total perceived needs of healthcare. In contrast, Hispanic have positive indirect effect through paid sick leaves, suggesting that Hispanics would have increased perceived needs of healthcare utilization which is due to their higher probability of working a job with paid sick leaves.

doi:10.6342/NTU202500318

However, this positive trend cannot cancel out the negative direct correlation between the Hispanic respondent's racial-ethnic background and their perceived needs of healthcare utilization.

I then examine the variables that potentially mediate the relationship between one's race-ethnicity and their behaviors of healthcare utilization. In Table 13, it can be inferred that the indirect effect through stressful experiences and the source of primary health insurance plan are statistically significant, suggesting that both the variables serve as valid mediators between African American respondent's racial-ethnic background and the times they are treated by a healthcare provider when needed. The positive indirect effect through stressful experience suggests that African American, compared to being Non-Hispanic White, have averagely experience more stressful life events, which, in turn, slightly increases the number of times they are treated by healthcare providers when needed. In the meantime, the negative indirect effects through the source of primary health insurance plan imply different mechanisms due to the different direction of correlation between the respondent's race-ethnicity and the mediators. Based on the regression results, the lower probability of African American to have primary health insurance provided by a plan sponsor results in fewer times of treated when needed.

Finally, the result in Table 14 suggested that the indirect effect from race-ethnicity through the source of primary health insurance to times of treated by healthcare providers is significantly negative for Hispanic respondents. That is, the averagely fewer log counts of times being treated when needed for Hispanic can be partially explain by the fact that they are less likely to have primary health insurance provided by a plan sponsor.

In summary, the significances of indirect effects through the potential mediators overall support Hypothesis 4 that psychosocial resources can serve as mediators between

doi:10.6342/NTU202500318

race-ethnicity and healthcare utilization. A critical takeaway from the mediation analysis is that the indirect effects of psychosocial resources work differently due to their different relationships with healthcare utilization. Unlike what's been hypothesized in the RCM that limited psychosocial resources are correlated with poorer health-related behaviors, the reserved mental capacity can sometimes lead to more active healthcare utilization among racial-ethnic minorities.

6. Discussion and Conclusion

The current study intends to fill the intellectual gaps in explaining the racial-ethnic disparities in healthcare utilization by exploring whether resilient psychosocial resources serve as mediating pathways between one's racial-ethnic background and their healthcare utilization, and if so, how might different psychosocial resources work differently across racial-ethnic groups. I adapted the reserve capacity model proposed by Gallo and Matthews (2003) to theorize the potential mediating role of the psychosocial resources and tested the research hypotheses with panel data from NLSY97.

Using data from the 2005 to 2009 survey of NLSY97, the first stage of my statistical analysis with random-effect regression models to examine the direct correlation of the following three sets of variables: race-ethnicity and healthcare utilization, race-ethnicity and psychosocial resources, psychosocial resources and healthcare utilization (when controlling for race-ethnicity). Some major findings can be noted: First, results show that both African American and Hispanic, compared to Non-Hispanic White, reported fewer needs of healthcare and fewer times of treated by healthcare provider when needed. Since the respondent's physical health was controlled in the models, the results might be implying that for individuals who are equally healthy, ones who are racial-ethnic minorities can be less likely to consider themselves need healthcare. Furthermore, their behavioral patterns of

doi:10.6342/NTU202500318

healthcare utilization might also not satisfy their needs of healthcare since the evidence suggests that they are less likely to seek treatment when needed.

Second, it can also be observed that respondents with different racial-ethnic backgrounds have different advantage or lack in psychosocial resources. Moreover, results suggest that racial-ethnic minorities do not necessarily have poorer psychosocial resources. Comparing to Non-Hispanic White, both African American and Hispanic reported averagely lower score of depression, higher probability to be living with a kinship and have paid sick leaves from their job, which are all important factors in enhancing one's mental capacity when facing stressful incidents such as being ill or injured. While the first two findings align with previous research (Barnes et al., 2013; Mulvaney-Day et al., 2012), the latter may seem counterintuitive, given the common assumption that racial-ethnic minorities receive fewer workplace benefits. A possible explanation for this outcome is that many racial-ethnic minority workers in the study held low-wage jobs in large companies, which are more likely to offer employee benefits such as paid sick leave (Burke & Morton, 1990), therefore resulting in the observed pattern in the current study.

Third, results suggest that the correlation between psychosocial resources and are rather various than the monotonic relationship hypothesized in RCM. While having paid sick leaves and primary health insurance provided by a plan sponsor, which are social institutional supports that can boost one's mental capacity, enhance one's healthcare utilization, being more depressed and had experienced more stressful life are also positively correlated with both the respondent's needs and behaviors of healthcare utilization.

The third finding, though seemingly counterintuitive, holds a significant theoretical implication: poor psychological well-being should not be viewed simply as a deficit in mental capacity; its effects can vary depending on the context. This does not only refute the assumed

doi:10.6342/NTU202500318

positive relationship between psychosocial resources and health behaviors in RCM, but also broadly challenges the stress paradigm in explaining the disparity of health behaviors. The stress paradigm suggests that individuals living in disadvantaged social environments are chronically exposed to a variety of stressors in their daily life, which has limited their ability in engaging health-improving behaviors (Lutfey & Freese, 2005). However, my findings suggest that in certain cases, intense mental distress does not necessarily hamper one's capacity to seek health. In fact, previous studies have shown that individuals with higher levels of psychological distress are more likely to utilize accessible outpatient care for somatic symptoms (Dickerson et al., 2003; Fogarty et al., 2008; Iturralde et al., 2019). This is because psychological disorders, such as anxiety, can heighten individuals' awareness of their physical health and increase their tendency to seek healthcare when experiencing discomfort (Horenstein & Heimberg, 2020). Aligning with this body of research, my findings suggest that the greater mental distress experienced by racial minorities may similarly enhance their perception of somatic conditions, motivating them to seek accessible healthcare services more actively.

Mediation analyses were also conducted to examine the mediating role of psychosocial resources by evaluating the indirect effects. Most of the indirect effects through psychosocial resources have been tested to be statistically significant in the multilevel mediation analysis, suggesting that my theoretical framework can be useful in understanding the mechanisms of racial-ethnic healthcare disparities in health seeking behaviors. While the varied directions of indirect effect suggest that psychosocial resources can work differently as mediators, the directions do not differ across race-ethnicity. Thus, it can be inferred that while psychosocial resources might be distributed variously across racial-ethnic groups, its mediating effect does not differ. The positive indirect effect through depression and stressful events suggests that, in contrast to what the Reserved Capacity Model predicted, a lack of

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resilient resources does not hamper one's capacity to utilize healthcare but rather increase awareness of healthcare needs and the likelihood of seeking care when needed. However, the takeaway from this finding is not that we should exacerbate racial-ethnic minorities' mental health to reduce racial healthcare disparities. Instead, the results remind us that (1) in studies addressing disparities, the minorities should not be studied through a deficit-based lens (Lee et al., 2024), and (2) the observed healthcare disparities are not irreversible. Policymakers should consider leveraging the increased tendency to seek healthcare during intense mental distress and aim to close the utilization gaps among racial-ethnic groups by providing more institutional support.

None of the interpersonal resilience sources provided by social relationships serve as potential pathways for explaining racial-ethnic gaps in healthcare utilization. This finding surprised me, given that previous research has emphasized the importance of social support, particularly among racial-ethnic groups like Hispanics, who share a collective culture and place high value on relationships with kin and neighbors. However, it is important to note that the current study measured social support through marital status and living arrangements. The underlying assumption of this operationalization was that the mere physical presence of significant others in one's daily life would encourage a greater tendency to seek healthcare when needed. However, as previous studies on social networks suggest, social relationships can function as either support or strain (Due et al., 1999), which can have different implications for physical and mental well-being (Walen & Lachman, 2000; Yang et al., 2014). Future research should further explore whether the quality of interpersonal resources plays a role in improving healthcare utilization among racial-ethnic minorities.

There are some limitations of this study that need to be noted. First, addressed in the previous discussion in methodology, the multilevel mediation model proposed by Krull and McKinnon (2001), which was based on the estimation of multilevel linear regression models,

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was used in my analysis while most of my mediator and outcome variables are not continuous variables. The main reason for this methodological decision was that Krull and McKinnon's model can deal with clustered errors in panel data and is rather parsimonious than the SEM. However, while it sufficed the main goal of the current study to examine the significance of direction of indirect effects through psychosocial resources, it cannot identify the real magnitude of the mediating effects. The magnitude of the indirect effects can be important if we'd like to know the percentage of mediation, which is useful information in determining the importance of a mediator. Future research should use models that work better with categorical measures or different measurements of psychosocial resources to evaluate the magnitude of mediating effects in comparison to the direct and the total effects.

Second, the descriptive statistics demonstrated that the age range of the respondents in the current study is 21 to 29 within the five-year period, indicating that the results depict the behavioral patterns of individuals in their early adulthood. However, one's healthcare utilization behaviors can change, especially as they age and are more likely to experience decline in physical health. It would be ideal if future study can work with data from respondents from a wider age range and observe if the mediating effect fluctuates throughout one's different life stages.

Third, because the primary goal of this study is to examine the psychosocial mechanisms linking racial-ethnic background to healthcare utilization, the broader context of racial healthcare disparities was not fully addressed in my discussion. As noted in previous literature, racial-ethnic disparities in healthcare are deeply rooted in the United States' history of racism and are further shaped by structural factors such as inequalities in health literacy, neighborhood segregation, and racial discrimination (Williams & Rucker, 2000; Spencer & Grace, 2016). In future work, I plan to integrate these contextual factors into my discussion to

doi:10.6342/NTU202500318

develop a more comprehensive theoretical framework for understanding racial healthcare disparities.

Despite the limitations, the current study can be still considered contributive for it extends the previous theory in racial healthcare disparities beyond observations focusing on medical counters, where individuals have already taken the patient role. Instead, I examining psychosocial resources experienced in daily life as mechanisms to understand that if racial-ethnic healthcare disparities already took place before individuals entered the health service system. The research results suggest that intrapersonal mental distress and institutional support from workplace serve as important mechanisms in understanding racial-ethnic gaps in healthcare utilization. Future policy making should consider this as a leverage in designing new policies aiming to improve healthcare equality among racial-ethic groups.

doi:10.6342/NTU202500318

Table 1. Descriptive Statistics (N=8,984) (cont.)

Time-invariant Variables	Obs.	%	Std. Dev.	Min	Max	Obs.	%	Std. Dev.	Min	Max
Race-ethnicity	8,638					8,638				
Non-Hispanic White		51.01%	0.500	0	1		51.01%	0.500	0	1
African American		27.01%	0.444	0	1		27.01%	0.444	0	1
Hispanic		21.98%	0.414	0	1		21.98%	0.414	0	1
Gender	8,662					8,662				
Male		51.25%	0.499	0	1		51.25%	0.499	0	1
Female		48.75%	0.499	0	1		48.75%	0.499	0	1
			2005					2006		
Time-variant Variables	Obs.	Mean /%	Std. Dev.	Min	Max	Obs.	Mean /%	Std. Dev.	Min	Max
Total Perceived Needs of Healthcare	7,038	1.701	1.972	0	8	7,267	1.575	1.913	0	8
Times Treated by Healthcare Providers when Needed	7,066	0.768	1.162	0	4	7,282	0.705	1.121	0	4
Depression	6,923	4.486	2.493	0	15					
Stressful Experiences	8,662	0.612	0.694	0	4	8,662	0.645	0.733	0	4
Married	7,070	16.65%	0.37	0	1	7,282	20.32%	0.402	0	1
Living Alone	7,079	11.48%	0.32	0	1	7,294	11.749%	0.322	0	1
Living with Kins	8,662	64.66%	0.48	0	1	8,662	66.94%	0.47	0	1
Paid Sick Leaves	4,357	37.48%	0.48	0	1	4,669	42.41%	0.49	0	1
Source of Health Insurance Plan	7,028					7,262				
No Health Insurance		33.68%	0.47	0	1		33.08%	0.47	0	1
Plan Sponsor		63.42%	0.48	0	1		63.72%	0.48	0	1
Self-bought		2.90%	0.17	0	1		3.21%	0.18	0	1
Age	8,662	22.99169	1.40	21	25	8,662	23.99169	1.40	22	26
Years of Education	7,025	10.9395	4.52	0	20	7,238	11.18734	4.57	0	20
Logged Household Income	5,777	10.393	10.393	0	12.748	5,785	10.44537	1.17	1.099	12.680
Reported Zero Household Income	8,662	1.30%	0.113	0	1	8,662	0.015239	0.12	0	1
Insurance Interruption	7,072	44.73%	0.50	0	1	7,287	44.17%	0.50	0	1
Resides in Rural	7,025	18.70%	0.39	0	1	7,242	19.06%	0.39	0	1
Ever Received Diagnosis of Chronic Conditions	8,132	15.22%	0.36	0	1	8,132	15.31%	0.36	0	1

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Table 1. Descriptive Statistics (N=8,984) (cont.)

Time-invariant Variables	Obs.	%	Std. Dev.	Min	Max	Obs.	%	Std. Dev.	Min	Max
Race-ethnicity	8,638					8,638				
Non-Hispanic White		51.01%	0.500	0	1		51.01%	0.500	0	1
African American		27.01%	0.444	0	1		27.01%	0.444	0	1
Hispanic		21.98%	0.414	0	1		21.98%	0.414	0	1
Gender	8,662					8,662				
Male		51.25%	0.499	0	1		51.25%	0.499	0	1
Female		48.75%	0.499	0	1		48.75%	0.499	0	1
			2007					2008		
Time-variant Variables	Obs.	Mean /%	Std. Dev.	Min	Max	Obs.	Mean /%	Std. Dev.	Min	Max
Total Perceived Needs of Healthcare	7,140	1.594	1.915	0	8	7,199	1.531	1.907	0	8
Times Treated by Healthcare Providers when Needed	7,155	0.702	1.117	0	4	7,221	0.674	1.106	0	4
Depression	6,913	4.375	2.412	0	15					
Stressful Experiences	8,662	0.671	0.753	0	5	8,662	0.698	0.758	0	5
Married	7,151	23.493%	0.424	0	1	7,214	26.39%	0.441	0	1
Living Alone	7,165	12.71%	0.333	0	1	7,232	12.09%	0.326	0	1
Living with Kins	8,662	65.80%	0.474	0	1	8,662	67.74%	0.467	0	1
Paid Sick Leaves	4,649	46.57%	0.499	0	1	4,747	51.21%	0.500	0	1
Source of Health Insurance Plan	7,103					7,182				
No Health Insurance		32.54%	0.469	0	1		33.57%	0.472	0	1
Plan Sponsor		64.13%	0.480	0	1		63.20%	0.482	0	1
Self-bought		3.34%	0.180	0	1		3.23%	0.177	0	1
Age	8,662	24.99169	1.395	23	27	8,662	25.99169	1.395	24	28
Years of Education	7,119	11.48588	4.596	0	20	7,188	11.61269	4.656	0	20
Logged Household Income	5,909	10.53004	1.103	1.099	12.539	6,046	10.593	1.070	3.296	12.656
Reported Zero Household Income	8,662	0.012584	0.111			8,662	1.84%	0.134	0	1
Insurance Interruption	7,155	43.77%	0.496	0	1	7,222	42.87%	0.495	0	1
Resides in Rural	7,093	19.06%	0.393	0	1	7,169	18.02%	0.384	0	1
Ever Received Diagnosis of Chronic Conditions	8,132	15.38%	0.361	0	1	8,132	15.38%	0.361	0	1

doi:10.6342/NTU202500318

Table 1. Descriptive Statistics (N=8,984)

Time-invariant Variables	Obs.	%	Std. Dev.	Min	Max	Obs.	%	Std. Dev.	Min	Max
Race-ethnicity	8,638					20,545				
Non-Hispanic White		51.01%	0.500	0	1		54.59%	0.498	0	1
African American		27.01%	0.444	0	1		24.09%	0.428	0	1
Hispanic		21.98%	0.414	0	1		21.32%	0.410	0	1
Gender	8,662					20,545				
Male		51.25%	0.499	0	1		47.51%	0.499	0	1
Female		48.75%	0.499	0	1		52.49%	0.499	0	1
			2009					Overall		
Time-variant Variables	Obs.	Mean /%	Std. Dev.	Min	Max	Obs.	Mean /%	Std. Dev.	Min	Max
Total Perceived Needs of Healthcare	7,280	1.205	1.762	0	8	20,545	1.590	1.891	0	8
Times Treated by Healthcare Providers when Needed	7,291	0.512	1.002	0	4	20,545	0.695	1.102	0	4
Depression	6,881	4.562	2.431	0	15	12,327	4.428	2.351	0	15
Stressful Experiences	8,662	0.708	0.760	0	5	20,545	0.763	0.721	0	5
Married	7,283	28.99%	0.454	0	1	20,545	74.83%	0.434	0	1
Living Alone	7,299	11.91%	0.324	0	1	20,545	10.71%	0.309	0	1
Living with Kins	8,662	69.44%	0.461	0	1	20,545	80.67%	0.395	0	1
Paid Sick Leaves	4,742	53.16%	0.499	0	1	15,732	48.27%	0.500	0	1
Source of Health Insurance Plan	7,258					20,545				
No Health Insurance		33.57%	0.472	0	1		29.53%	0.456	0	1
Plan Sponsor		63.20%	0.482	0	1		67.01%	0.470	0	1
Self-bought		3.23%	0.177	0	1		3.47%	0.183	0	1
Age	8,662	26.992	1.395	25	29	20,545	24.981	1.979	21	29
Years of Education	7,239	11.815	4.569	0	20	20,545	12.122	4.082	0	20
Logged Household Income	6,272	10.624	1.067	3.258	12.655	20,545	10.594	1.307	0	12.748
Reported Zero Household Income	8,662	1.81%	0.133	0	1	20,545	0.98%	0.098	0	1
Insurance Interruption	7,290	41.76%	0.493	0	1	20,545	39.84%	0.490	0	1
Resides in Rural	7,243	16.08%	0.367	0	1	20,545	17.86%	0.383	0	1
Ever Received Diagnosis of Chronic Conditions	8,132	15.38%	0.361	0	1	20,545	17.15%	0.377	0	1

Note: This table demonstrates the descriptive statistics of the full sample by year, mainly to show the characteristics of this sample. In the analytical model, However, respondents with missing values in the core independent variables, mediators, and the dependent variables will be omitted. Moreover, in the analytical sample, simple imputation would be applied to missing values. (1) Missing values in education are imputed with the mean of years of education in the survey year. (2) Missing values in gross family annual income were imputed with the mean gross family income of other respondents who have received the same years of education in the survey year, then converted to the logged value. 0 income was first imputed with the minimum value of gross household income in the year then converted to the logged value. An additional dummy variable measures whether the respondent reported zero income was included in every model.

doi:10.6342/NTU202500318

Table 2. Random-effect Poisson Regression results of correlations between race-ethnicity and healthcare utilization for African American and Non-Hispanic White

	Total Needs of Healthcare (1)		Treated when Needed (2)	
African American (ref: Non-Hispanic White)	-0.312	***	-0.143	***
	(0.033)		(0.027)	
Female (ref: Male)	0.489	***	0.155	***
	(0.030)		(0.025)	
Age	-0.053	***	-0.020	***
	(0.004)		(0.005)	
Years of Education	-0.002		-0.001	
	(0.003)		(0.003)	
Logged Income	0.017	*	0.016	
	(0.008)		(0.011)	
Reported Zero Income	-0.056		0.065	
	(0.115)		(0.154)	
Living in Rural Area	-0.024		0.020	
	(0.024)		(0.027)	
Insurance Interruption	-0.105	***	-0.117	***
	(0.017)		(0.022)	
Chronic Condition Diagnosis (Ever)	0.310	***	0.117	***
	(0.038)		(0.028)	
Total Needs of Healthcare			0.403	***
			(0.004)	
_cons	1.439	***	-1.083	***
	(0.129)		(0.166)	
lnalpha	-0.571	***	-2.300	***
	(0.032)		(0.105)	
Obs.	16,165		16,165	
Groups of Obs.	3,233		3,233	

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table 3. Random-effect Poisson Regression results of correlations between race-ethnicity and healthcare utilization for Hispanic and Non-Hispanic White

	Total Needs of Healthcare		Treated when Needed	
	(1)		(2)	
Hispanic (ref: Non-Hispanic White)	-0.228	***	-0.149	***
	(0.034)		(0.029)	
Female (ref: Male)	0.468	***	0.164	***
	(0.030)		(0.025)	
Age	-0.054	***	-0.018	**
	(0.004)		(0.005)	
Years of Education	-0.004		-0.002	
	(0.003)		(0.003)	
Logged Income	0.005		0.004	
	(0.009)		(0.011)	
Reported Zero Income	-0.156		-0.106	
	(0.123)		(0.170)	
Living in Rural Area	-0.020		0.010	
	(0.024)		(0.028)	
Insurance Interruption	-0.143	***	-0.165	***
	(0.017)		(0.023)	
Chronic Condition Diagnosis (Ever)	0.280	***	0.119	***
	(0.038)		(0.029)	
Total Needs of Healthcare			0.402	***
			(0.005)	
_cons	1.667	***	-0.994	***
	(0.131)		(0.171)	
lnalpha	-0.608	***	-2.191	***
	(0.033)		(0.101)	
Obs.	15,595		15,595	
Groups of Obs.	3,117		3,117	

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table 4. Random-effect Linear and Logistic Regression results of correlations between race-ethnicity and psychosocial resources for African American and Non-Hispanic White

	Depression		Stressful Experiences		Married		Living Alone		Living with Kins		Paid Sick Leave		Insurance provided by a Plan Sponsor	
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
African American (ref: Non-Hispanic White)	-0.146	*	0.114	***	-3.690	***	0.137		0.866	***	0.824	***	-0.261	**
	(0.072)		(0.027)		(0.238)		(0.124)		(0.129)		(0.111)		(0.095)	
Female (ref: Male)	0.674	***	0.089	***	1.087	***	-0.862	***	1.162	***	0.092		0.828	***
	(0.066)		(0.025)		(0.220)		(0.115)		(0.116)		(0.100)		(0.087)	
Age	0.010		0.015	***	0.775	***	0.018		0.128	***	0.235	***	-0.034	*
	(0.010)		(0.001)		(0.031)		(0.020)		(0.019)		(0.017)		(0.014)	
Years of Education	-0.045	***	0.001		0.025		0.165	***	-0.185	***	0.187	***	0.110	***
	(0.008)		(0.001)		(0.025)		(0.016)		(0.015)		(0.014)		0.010	
Logged Income	0.011		0.000		0.209		-0.525		0.898		0.226		0.179	***
	(0.023)		(0.001)		(0.060)		(0.036)		(0.037)		(0.037)		(0.028)	
Reported Zero Income	-0.295		-0.006		0.752		-3.442		6.709		2.241		0.886	**
	(0.294)		(0.017)		(0.799)		(0.422)		(0.438)		(0.495)		(0.339)	
Living in Rural Area	-0.077		-0.002		0.393	**	-0.603	***	0.987	***	-0.158		-0.048	
	(0.060)		(0.005)		(0.145)		(0.116)		(0.106)		(0.094)		(0.078)	
Insurance Interruption	0.153	***	0.001		-0.749	***	-0.158		0.215	**	-1.117	***		
	(0.046)		(0.003)		(0.109)		(0.082)		(0.075)		(0.071)			
Chronic Condition Diagnosis (Ever)	0.423	***	0.100	***	-0.594	*	0.164		-0.034		0.156		0.001	
	(0.085)		(0.028)		(0.275)		(0.146)		(0.149)		(0.130)		(0.113)	
_cons	4.195	***	0.284	***	-26.460	***	0.122		-8.925	***	-10.898	***	-1.472	***
	(0.322)		(0.030)		(0.995)		(0.584)		(0.568)		(0.576)		(0.441)	
lnalpha					3.705	***	1.576	***	1.844	***	1.643	***	1.376	***
					(0.058)		(0.069)		(0.059)		(0.059)		(0.053)	
Obs.	9,699		16,165		16,165		16,165		16,165		12,347		16,165	
Groups of Obs.	3,233		3,233		3,233		3,233		3,233		3,233		3,233	

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table 5. Random-effect Linear and Logistic Regression results of correlations between race-ethnicity and psychosocial resources for Hispanic and Non-Hispanic White

	Depression		Stressful Experiences		Married		Living Alone		Living with Kins		Paid Sick Leave		Insurance provided by a Plan Sponsor	
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Hispanic (ref: Non-Hispanic White)	-0.172	*	0.023		-0.400		-0.824	***	1.472	***	1.223	***	-0.354	***
	(0.075)		(0.028)		(0.230)		(0.143)		(0.144)		(0.122)		(0.101)	
Female (ref: Male)	0.644	***	0.045		1.379	***	-0.687	***	1.003	***	0.151		0.502	***
	(0.066)		(0.025)		(0.205)		(0.116)		(0.117)		(0.105)		(0.089)	
Age	0.003		0.014	***	0.710	***	0.026		0.135	***	0.204	***	-0.011	
	(0.010)		(0.001)		(0.028)		(0.021)		(0.019)		(0.018)		(0.014)	
Years of Education	-0.035	***	0.000		0.008		0.165	***	-0.180	***	0.173	***	0.124	***
	(0.008)		(0.001)		(0.023)		(0.017)		(0.015)		(0.014)		(0.010)	
Logged Income	-0.004		-0.001		0.085		-0.547	***	0.975	***	0.236	***	0.170	***
	(0.024)		(0.001)		(0.055)		(0.039)		(0.040)		(0.040)		(0.030)	
Reported Zero Income	0.485		-0.007		-0.996		-3.339	***	6.594	***	1.434	*	0.993	**
	(0.321)		(0.018)		(0.813)		(0.471)		(0.478)		(0.563)		(0.383)	
Living in Rural Area	-0.104		-0.004		0.384	**	-0.468	***	0.882	***	-0.192		-0.063	
	(0.062)		(0.004)		(0.139)		(0.121)		(0.110)		(0.100)		(0.082)	
Insurance Interruption	0.148	**	0.002		-0.779	***	-0.069		0.166	*	-1.175	***		
	(0.046)		(0.003)		(0.101)		(0.087)		(0.078)		(0.073)			
Chronic Condition Diagnosis (Ever)	0.380	***	0.047		-0.421		0.138		0.047		0.205		0.102	
	(0.087)		(0.028)		(0.266)		(0.151)		(0.153)		(0.139)		(0.119)	
_cons	4.447	***	0.353	***	-22.972	***	0.125		-9.936	***	-10.070	***	-1.964	***
	(0.324)		(0.030)		(0.894)		(0.612)		(0.593)		(0.590)		(0.454)	
lnalpha					3.558	***	1.454	***	1.764	***	1.714	***	1.404	***
					(0.061)		(0.076)		(0.063)		(0.060)		(0.054)	
Obs.	9,357		15,595		15,595		15,595		15,595		12,102		15,595	
Groups of Obs.	3,119		3,119		3,119		3,119		3,119		3,119		3,119	

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table 6. Random-effect Poisson Regression results of correlation between psychosocial resources and total perceived needs of healthcare for African American and Non-Hispanic White

	Total Perceived Needs of Healthcare													
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Depression	0.039	***												
	(0.005)													
Stressful Experiences			0.112	***										
			(0.019)											
Marital Status					0.017									
					(0.024)									
Living Alone							-0.029							
							(0.025)							
Living with Kins									-0.035					
									(0.021)					
Paid Sick Leave											0.051	*		
											(0.020)			
Source of Insurance (ref: No Insurance)														
Provided by a Plan Sponsor													0.154	***
													(0.019)	
Self-bought													0.010	
													(0.044)	
African American (ref: Non-Hispanic White)	-0.306	***	-0.327	***	-0.309	***	-0.311	***	-0.309	***	-0.303	***	-0.315	***
	(0.035)		(0.033)		(0.033)		(0.033)		(0.033)		(0.035)		(0.033)	
Female (ref: Male)	0.454	***	0.480	***	0.488	***	0.488	***	0.492	***	0.509	***	0.483	***
	(0.032)		(0.030)		(0.030)		(0.030)		(0.030)		(0.032)		(0.030)	
Age	-0.061	***	-0.055	***	-0.054	***	-0.053	***	-0.053	***	-0.053	***	-0.052	***
	(0.005)		(0.004)		(0.004)		(0.004)		(0.004)		(0.005)		(0.004)	
Years of Education	-0.004		0.000		-0.002		-0.001		-0.002		-0.007		-0.002	
	(0.004)		(0.003)		(0.003)		(0.003)		(0.003)		(0.004)		(0.003)	
Logged Income	0.013		0.017	*	0.017	*	0.016		0.021	*	0.020	*	0.016	*
	(0.011)		(0.008)		(0.008)		(0.008)		(0.009)		(0.010)		(0.008)	
Reported Zero Income	-0.272		-0.050		-0.057		-0.064		-0.030		-0.129		-0.054	
	(0.165)		(0.115)		(0.115)		(0.116)		(0.116)		(0.159)		(0.115)	
Living in Rural Area	-0.045		-0.024		-0.025		-0.025		-0.021		-0.028		-0.025	
	(0.029)		(0.024)		(0.024)		(0.024)		(0.024)		(0.027)		(0.024)	

doi:10.6342/NTU202500318

Insurance Interruption	-0.114	***	-0.107	***	-0.104	***	-0.105	***	-0.105	***	-0.095	***						
	(0.022)		(0.017)		(0.017)		(0.017)		(0.017)		(0.020)							
Chronic Condition Diagnosis (Ever)	0.315	***	0.301	***	0.311	***	0.311	***	0.310	***	0.292	***	0.308	***				
	(0.039)		(0.037)		(0.038)		(0.038)		(0.038)		(0.040)		(0.037)					
_cons	1.561	***	1.389	***	1.452	***	1.453	***	1.424	***	1.433	***	1.284	***				
	(0.155)		(0.129)		(0.130)		(0.130)		(0.129)		(0.155)		(0.128)					
lnalpha	-0.592	***	-0.586	***	-0.570	***	-0.571	***	-0.571	***	-0.520	***	-0.578	***				
	(0.038)		(0.032)		(0.032)		(0.032)		(0.032)		(0.035)		(0.032)					
Obs.	9,699		16,165		16,165		16,165		16,165		12,347		16,165					
Groups of Obs.	3,233		3,233		3,233		3,233		3,233		3,233		3,233					

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

Table 7. Random-effect Poisson Regression results of correlation between psychosocial resources and times of treated when need healthcare for African American and Non-Hispanic White

	Times of Treated by Healthcare Providers when Needed						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Depression	0.008						
	(0.005)						
Stressful Experiences		0.055 ***					
		(0.016)					
Marital Status			0.024				
			(0.026)				
Living Alone				0.014			
				(0.033)			
Living with Kins					-0.004		
					(0.027)		
Paid Sick Leave						-0.030	
						(0.025)	
Source of Insurance (ref: No Insurance)							
Provided by a Plan Sponsor							0.187 ***
							(0.026)
Self-bought							0.175 **
							(0.057)

doi:10.6342/NTU202500318

African American (ref: Non-Hispanic White)	-0.148	***	-0.151	***	-0.139	***	-0.143	***	-0.143	***	-0.131	***	-0.141	***				
	(0.031)		(0.027)		(0.027)		(0.027)		(0.027)		(0.030)		(0.027)					
Female (ref: Male)	0.117	***	0.151	***	0.154	***	0.156	***	0.156	***	0.162	***	0.149	***				
	(0.028)		(0.025)		(0.025)		(0.025)		(0.025)		(0.027)		(0.025)					
Age	-0.027	***	-0.021	***	-0.021	***	-0.020	***	-0.020	***	-0.017	**	-0.020	***				
	(0.006)		(0.005)		(0.005)		(0.005)		(0.005)		(0.006)		(0.005)					
Years of Education	0.001		-0.001		-0.001		-0.001		-0.001		0.001		-0.003					
	(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)					
Logged Income	0.002		0.016		0.015		0.017		0.016		0.020		0.014					
	(0.013)		(0.011)		(0.011)		(0.011)		(0.011)		(0.013)		(0.011)					
Reported Zero Income	-0.139		0.070		0.062		0.071		0.069		0.085		0.065					
	(0.214)		(0.154)		(0.155)		(0.155)		(0.157)		(0.211)		(0.154)					
Living in Rural Area	0.027		0.021		0.019		0.021		0.021		0.066	*	0.020					
	(0.032)		(0.027)		(0.027)		(0.027)		(0.027)		(0.030)		(0.027)					
Insurance Interruption	-0.135	***	-0.119	***	-0.115	***	-0.116	***	-0.117	***	-0.111	***						
	(0.027)		(0.022)		(0.022)		(0.022)		(0.022)		(0.026)							
Chronic Condition Diagnosis (Ever)	0.083	**	0.113	***	0.117	***	0.117	***	0.117	***	0.108	***	0.114	***				
	(0.031)		(0.028)		(0.028)		(0.028)		(0.028)		(0.031)		(0.028)					
Total Perceived Needs of Healthcare	0.403	***	0.402	***	0.403	***	0.403	***	0.403	***	0.406	***	0.402	***				
	(0.006)		(0.004)		(0.004)		(0.004)		(0.004)		(0.005)		(0.004)					
_cons	-0.811	***	-1.116	***	-1.059	***	-1.092	***	-1.085	***	-1.272	***	-1.242	***				
	(0.196)		(0.166)		(0.168)		(0.167)		(0.167)		(0.196)		(0.164)					
lnalpha	-3.099	***	-2.319	***	-2.296	***	-2.299	***	-2.300	***	-2.412	***	-2.311	***				
	(0.255)		(0.107)		(0.105)		(0.105)		(0.105)		(0.135)		(0.106)					
Obs.	9,699		16,165		16,165		16,165		16,165		12,347		16,165					
Groups of Obs.	3,233		3,233		3,233		3,233		3,233		3,233		3,233					

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table 8. Random-effect Poisson Regression results of correlation between psychosocial resources and total perceived needs of healthcare for Hispanic and Non-Hispanic White

	Total Perceived Needs of Healthcare													
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Depression	0.038	***												
	(0.005)													
Stressful Experiences			0.119	***										
			(0.019)											
Marital Status					0.029									
					(0.022)									
Living Alone							-0.025							
							(0.026)							
Living with Kins									-0.036					
									(0.022)					
Paid Sick Leave											0.066	**		
											(0.020)			
Source of Insurance (ref: No Insurance)														
Provided by a Plan Sponsor													0.183	***
													(0.020)	
Self-bought													0.044	
													(0.044)	
Hispanic (ref: Non-Hispanic White)	-0.233	***	-0.233	***	-0.228	***	-0.229	***	-0.225	***	-0.222	***	-0.231	***
	(0.036)		(0.034)		(0.034)		(0.034)		(0.034)		(0.036)		(0.034)	
Female (ref: Male)	0.430	***	0.462	***	0.466	***	0.467	***	0.471	***	0.477	***	0.463	***
	(0.032)		(0.029)		(0.030)		(0.030)		(0.030)		(0.031)		(0.030)	
Age	-0.066	***	-0.056	***	-0.055	***	-0.054	***	-0.054	***	-0.055	***	-0.052	***
	(0.005)		(0.004)		(0.004)		(0.004)		(0.004)		(0.005)		(0.004)	
Years of Education	-0.004		-0.003		-0.004		-0.004		-0.005		-0.008	*	-0.005	
	(0.004)		(0.003)		(0.003)		(0.003)		(0.003)		(0.004)		(0.003)	
Logged Income	0.003		0.005		0.004		0.003		0.008		0.000		0.004	
	(0.011)		(0.009)		(0.009)		(0.009)		(0.009)		(0.011)		(0.009)	
Reported Zero Income	-0.296		-0.146		-0.156		-0.162		-0.129		-0.343	*	-0.142	
	(0.173)		(0.123)		(0.123)		(0.124)		(0.124)		(0.170)		(0.123)	
Living in Rural Area	-0.042		-0.019		-0.021		-0.020		-0.017		-0.025		-0.021	

doi:10.6342/NTU202500318

	(0.030)		(0.024)		(0.024)		(0.024)		(0.024)		(0.028)		(0.024)											
Insurance Interruption	-0.153	***	-0.146	***	-0.141	***	-0.143	***	-0.142	***	-0.141	***												
	(0.022)		(0.017)		(0.017)		(0.017)		(0.017)		(0.021)													
Chronic Condition Diagnosis (Ever)	0.293	***	0.276	***	0.281	***	0.281	***	0.280	***	0.264	***	0.278	***										
	(0.041)		(0.038)		(0.038)		(0.038)		(0.038)		(0.041)		(0.038)											
_cons	1.810	***	1.600	***	1.692	***	1.679	***	1.649	***	1.757	***	1.455	***										
	(0.157)		(0.131)		(0.132)		(0.131)		(0.131)		(0.155)		(0.130)											
lnalpha	-0.582	***	-0.624	***	-0.606	***	-0.608	***	-0.608	***	-0.561	***	-0.615	***										
	(0.039)		(0.033)		(0.033)		(0.033)		(0.033)		(0.035)		(0.033)											
Obs.	9,357		15,595		15,595		15,595		15,595		12,102		15,595											
Groups of Obs.	3,119		3,119		3,119		3,119		3,119		3,119		3,119											

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

Table 9. Random-effect Poisson Regression results of correlation between psychosocial resources and times of treated when needed healthcare for Hispanic and Non-Hispanic White

	Times of Treated by Healthcare Providers when Needed						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Depression	0.001						
	(0.006)						
Stressful Experiences		0.040 *					
		(0.016)					
Marital Status			0.038				
			(0.025)				
Living Alone				0.042			
				(0.035)			
Living with Kins					-0.025		
					(0.029)		
Paid Sick Leave						-0.014	
						(0.026)	
Source of Insurance (ref: No Insurance)							
Provided by a Plan Sponsor							0.224 ***
							(0.027)
Self-bought							0.217 ***

doi:10.6342/NTU202500318

																	(0.057)	
Hispanic (ref: Non-Hispanic White)	-0.152	***	-0.150	***	-0.149	***	-0.148	***	-0.147	***	-0.122	***	-0.147	***
	(0.033)		(0.029)		(0.029)		(0.029)		(0.029)		(0.032)		(0.029)	
Female (ref: Male)	0.144	***	0.162	***	0.161	***	0.166	***	0.166	***	0.161	***	0.158	***
	(0.029)		(0.025)		(0.025)		(0.025)		(0.025)		(0.028)		(0.025)	
Age	-0.021	***	-0.018	***	-0.020	***	-0.018	**	-0.017	**	-0.019	**	-0.017	**
	(0.006)		(0.005)		(0.006)		(0.005)		(0.005)		(0.006)		(0.005)	
Years of Education	0.004		-0.001		-0.002		-0.002		-0.002		0.002		-0.003	
	(0.004)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)	
Logged Income	-0.016		0.005		0.003		0.006		0.007		0.006		0.004	
	(0.014)		(0.011)		(0.011)		(0.011)		(0.012)		(0.013)		(0.011)	
Reported Zero Income	-0.264		-0.099		-0.109		-0.091		-0.082		-0.075		-0.095	
	(0.227)		(0.170)		(0.170)		(0.171)		(0.172)		(0.230)		(0.170)	
Living in Rural Area	0.033		0.010		0.007		0.012		0.013		0.063		0.009	
	(0.034)		(0.028)		(0.028)		(0.028)		(0.028)		(0.031)		(0.028)	
Insurance Interruption	-0.186	***	-0.168	***	-0.162	***	-0.165	***	-0.165	***	-0.166	***		
	(0.028)		(0.023)		(0.023)		(0.023)		(0.023)		(0.027)			
Chronic Condition Diagnosis (Ever)	0.101	**	0.118	***	0.120	***	0.119	***	0.120	***	0.101	***	0.117	***
	(0.032)		(0.029)		(0.029)		(0.029)		(0.029)		(0.032)		(0.029)	
Total Perceived Needs of Healthcare	0.404	***	0.401	***	0.402	***	0.402	***	0.402	***	0.405	***	0.401	***
	(0.006)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)	
_cons	-0.774	***	-1.026	***	-0.954	***	-1.021	***	-1.013	***	-1.063	***	-1.220	***
	(0.200)		(0.171)		(0.173)		(0.172)		(0.172)		(0.201)		(0.169)	
lnalpha	-2.971	***	-2.197	***	-2.186	***	-2.190	***	-2.191	***	-2.260	***	-2.190	***
	(0.233)		(0.101)		(0.100)		(0.101)		(0.101)		(0.124)		(0.100)	
Obs.	9,357		15,595		15,595		15,595		15,595		12,102		15,595	
Groups of Obs.	3,119		3,119		3,119		3,119		3,119		3,119		3,119	

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table 10. Checklist of Psychosocial Resources Fulfilled the Premises of Mediation

Outcome Variables	Race-ethnicity	Psychosocial resources					
		Depression	Stressful Experiences	Married	Living with Kins	Paid Sick Leaves	Insurance provided by plan sponsors
Perceived Needs of Healthcare	African American	✓	✓			✓	✓
	Hispanic	✓					✓
Times of Treated when Needed	African American	✓	✓				✓
	Hispanic						✓

Table 11. Results of Meditation Analysis with African American as Exposure and Total Needs of Healthcare as Outcome

	Natural Indirect Effect			Natural Direct Effect			Total Effect		
Mediators	Estimate	Std Err	P-value	Estimate	Std Err	P-value	Estimate	Std Err	P-value
Depression	-0.011	0.006	0.067	-0.496	0.050	0.000	-0.506	0.051	0.000
Stressful Experiences	0.021	0.006	0.001	-0.525	0.048	0.000	-0.504	0.048	0.000
Sick Leave at Workplace	0.009	0.004	0.020	-0.498	0.052	0.000	-0.489	0.052	0.000
Primary Health Insurance from Plan Sponsor	-0.014	0.003	0.000	-0.509	0.048	0.000	-0.523	0.048	0.000

1. P-value <0.05 is considered to be statistically significant.
2. Total Effect = NDE + NIE

Table 12. Results of Meditation Analysis with Hispanic as Exposure and Total Needs of Healthcare as Outcome

	Natural Indirect Effect			Natural Direct Effect			Total Effect		
Mediators	Estimate	Std Err	P-value	Estimate	Std Err	P-value	Estimate	Std Err	P-value
Depression	-0.013	0.004	0.001	-0.407	0.042	0.000	-0.420	0.043	0.000
Sick Leave at Workplace	0.016	0.006	0.007	-0.395	0.051	0.000	-0.378	0.051	0.000
Primary Health Insurance from Plan Sponsor	-0.020	0.005	0.000	-0.406	0.050	0.000	-0.425	0.050	0.000

1. P-value <0.05 is considered to be statistically significant.
2. Total Effect = NDE + NIE

doi:10.6342/NTU202500318

Table 13. Results of Meditation Analysis with African American as Exposure and Times of Treated when Needed as Outcome

	Natural Indirect Effect			Natural Direct Effect			Total Effect		
Mediators	Estimate	Std Err	P-value	Estimate	Std Err	P-value	Estimate	Std Err	P-value
Stressful Experiences	0.003	0.001	0.041	-0.050	0.015	0.001	-0.047	0.015	0.001
Primary Health Insurance from Plan Sponsor	-0.001	0.001	0.049	-0.045	0.015	0.002	-0.046	0.015	0.002

1. P-value <0.05 is considered to be statistically significant.
2. Total Effect = NDE + NIE

Table 14. Results of Meditation Analysis with Hispanic as Exposure and Times of Treated when Needed as Outcome

	Natural Indirect Effect			Natural Direct Effect			Total Effect		
Mediators	Estimate	Std Err	P-value	Estimate	Std Err	P-value	Estimate	Std Err	P-value
Primary Health Insurance from Plan Sponsor	-0.002	0.001	0.023	-0.063	0.018	0.000	-0.065	0.018	0.000

1. P-value <0.05 is considered to be statistically significant.
2. Total Effect = NDE + NIE

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Appendix A. Multilevel Linear Results in Multilevel Mediation Analysis

Table A1. Multilevel linear regression results of correlations between race-ethnicity and healthcare utilization for African American and Non-Hispanic White

	Total Needs of Healthcare		Treated when Needed	
African American (ref: Non-Hispanic White)	-0.506	***	-0.048	**
	(0.050)		(0.017)	
Female	0.787	***	0.078	***
	(0.046)		(0.015)	
Age	-0.081	***	-0.006	*
	(0.007)		(0.003)	
Years of Education	-0.008		-0.003	
	(0.006)		(0.002)	
Logged Income	0.03	*	0.002	
	(0.015)		(0.006)	
Reported Zero Income	0.029		0.081	
	(0.185)		(0.078)	
Living in Rural Area	-0.062		0.019	
	(0.042)		(0.016)	
Insurance Interruption	-0.166	***	-0.059	***
	(0.031)		(0.013)	
Chronic Condition Diagnosis (Ever)	0.589	***	0.11	***
	(0.060)		(0.019)	
Total Needs of Healthcare			0.434	***
			(0.003)	
_cons	3.165	***	0.162	
	(0.235)		(0.096)	
Obs.	16,165		16,165	
Groups of obs.	3,233		3,233	

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table A2. Multilevel linear regression results of correlations between race-ethnicity and healthcare utilization for Hispanic and Non-Hispanic White

	Total Needs of Healthcare		Treated when Needed	
Hispanic (ref: Non-Hispanic White)	-0.404	***	-0.066	***
	(0.053)		(0.018)	
Female	0.776	***	0.093	***
	(0.047)		(0.016)	
Age	-0.084	***	-0.007	*
	(0.008)		(0.003)	
Years of Education	-0.012	*	-0.004	*
	(0.005)		(0.002)	
Logged Income	0.007		-0.001	
	(0.016)		(0.007)	
Reported Zero Income	-0.19		0.045	
	(0.208)		(0.089)	
Living in Rural Area	-0.055		0.013	
	(0.044)		(0.017)	
Insurance Interruption	-0.235	***	-0.079	***
	(0.032)		(0.013)	
Chronic Condition Diagnosis (Ever)	0.546	***	0.111	***
	(0.062)		(0.021)	
Total Needs of Healthcare			0.43	***
			(0.003)	
_cons	3.58	***	0.227	*
	(0.242)		(0.101)	
Obs.	15,595		15,595	
Groups of obs.	3,119		3,119	

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table A3. Multilevel linear regression results of correlations between race-ethnicity and psychosocial resources for African American and Non-Hispanic White

	Depression		Stressful Experiences		Married		Living Alone		Living with Kins		Paid Sick Leaves		Insurance provided by a Plan Sponsor	
African American (ref: Non-Hispanic White)	-0.146	*	0.114	***	-0.171	***	0.009		0.078	***	0.102	***	-0.017	**
	(0.072)		(0.027)		(0.014)		(0.008)		(0.011)		(0.014)		(0.006)	
Female	0.674	***	0.089	***	0.058	***	-0.053	***	0.097	***	0.012		0.044	***
	(0.066)		(0.025)		(0.012)		(0.008)		(0.010)		(0.013)		(0.005)	
Age	0.01		0.015	***	0.038	***	0.002		0.01	***	0.031	***	-0.005	***
	(0.010)		(0.001)		(0.001)		(0.001)		(0.002)		(0.002)		(0.001)	
Years of Education	-0.045	***	0.001		0.000		0.01	***	-0.015	***	0.023	***	0.008	***
	(0.008)		(0.001)		(0.001)		(0.001)		(0.001)		(0.002)		(0.001)	
Logged Income	0.011		0.000		0.013	***	-0.043	***	0.092	***	0.029	***	0.006	**
	(0.023)		(0.001)		(0.003)		(0.003)		(0.003)		(0.005)		(0.002)	
Reported Zero Income	-0.294		-0.006		0.081	**	-0.262	***	0.677	***	0.279	***	-0.005	
	(0.294)		(0.017)		(0.031)		(0.032)		(0.037)		(0.062)		(0.030)	
Living in Rural Area	-0.077		-0.002		0.025	***	-0.036	***	0.085	***	-0.019		-0.001	
	(0.060)		(0.005)		(0.008)		(0.007)		(0.009)		(0.012)		(0.006)	
Insurance Interruption	0.153		0.001		-0.042	***	-0.012	*	0.022	***	-0.15	***	-0.681	***
	(0.046)	***	(0.003)		(0.005)		(0.005)		(0.006)		(0.009)		(0.005)	
Chronic Condition Diagnosis (Ever)	0.423		0.1	***	-0.028		0.012		-0.002		0.02		0.006	
	(0.085)	***	(0.028)		(0.016)		(0.010)		(0.013)		(0.017)		(0.006)	
Self-bought Insurance													-0.856	***
													(0.011)	
_cons	4.193	***	0.284	***	-0.785	***	0.45	***	-0.362	***	-0.905	***	0.922	***
	(0.322)		(0.030)		(0.041)		(0.041)		(0.048)		(0.069)		(0.036)	
Obs.	9,699		16,165		16,165		16,165		16,165		12,347		16,165	
Groups of obs.	3,233		3,233		3,233		3,233		3,233		3,233		3,233	

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table A4. Multilevel linear regression results of correlations between race-ethnicity and psychosocial resources for Hispanic and Non-Hispanic White

	Depression	Stressful Experiences	Married	Living Alone	Living with Kins	Paid Sick Leaves	Insurance provided by a Plan Sponsor
Hispanic (ref: Non-Hispanic White)	-0.172 *	0.023	-0.023	-0.044 ***	0.112 ***	0.153 ***	-0.020 ***
	(0.075)	(0.028)	(0.015)	(0.008)	(0.011)	(0.015)	(0.006)
Female	0.644 ***	0.045	0.078 ***	-0.037 ***	0.080 ***	0.018	0.031 ***
	(0.066)	(0.025)	(0.014)	(0.007)	(0.010)	(0.013)	(0.005)
Age	0.003	0.014 ***	0.041 ***	0.002	0.010 ***	0.026 ***	-0.005 ***
	(0.010)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Years of Education	-0.035 ***	0.000	-0.001	0.008 ***	-0.014 ***	0.021 ***	0.008 ***
	(0.008)	(0.001)	(0.001) **	(0.001)	(0.001)	(0.002)	(0.001)
Logged Income	-0.003	-0.001	0.008	-0.043 ***	0.099 ***	0.030 ***	0.007 **
	(0.024)	(0.001)	(0.003)	(0.003)	(0.003)	(0.005)	(0.003)
Reported Zero Income	0.487	-0.007	0.021	-0.241 ***	0.662 ***	0.186 **	-0.001
	(0.321)	(0.018)	(0.037)	(0.034)	(0.040)	(0.067)	(0.034)
Living in Rural Area	-0.104	-0.004	0.028 ***	-0.027 ***	0.075 ***	-0.023	-0.005
	(0.062)	(0.004)	(0.009)	(0.007)	(0.009)	(0.012)	(0.006)
Insurance Interruption	0.147 ***	0.002	-0.052 ***	-0.006	0.019 **	-0.154 ***	-0.687 ***
	(0.046)	(0.003)	(0.006)	(0.005)	(0.006)	(0.009)	(0.005)
Chronic Condition Diagnosis (Ever)	0.380 ***	0.047	-0.022	0.010	0.006	0.027	0.009
	(0.087)	(0.028)	(0.018)	(0.009)	(0.013)	(0.017)	(0.007)
Self-bought Insurance							-0.857 ***
							(0.011)
_cons	4.445 ***	0.353 ***	-0.814 ***	0.444 ***	-0.444 ***	-0.774 ***	0.900 ***
	(0.324)	(0.030)	(0.045)	(0.039)	(0.047)	(0.070)	(0.037)
Obs.	9,357	15,595	15,595	15,595	15,595	12,102	15,595
Groups of obs.	3,119	3,119	3,119	3,119	3,119	3,119	3,119

1. * p<0.05, ** p<0.01, *** p<0.001

2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table A5. Multilevel linear regression results of correlations between psychosocial resources and total perceived needs of healthcare for African American and Non-Hispanic White

	Total Needs of Healthcare													
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
African American (ref: Non-Hispanic White)	-0.496	***	-0.525	***	-0.503	***	-0.506	***	-0.502	***	-0.498	***	-0.508	***
	(0.053)		(0.050)		(0.051)		(0.050)		(0.051)		(0.054)		(0.050)	
Depression	0.075	***												
	(0.009)													
Stressful Experiences			0.183	***										
			(0.031)											
Marital Status					0.020									
					(0.042)									
Living Alone							-0.035							
							(0.045)							
Living with Kins									-0.054					
									(0.039)					
Sick Leave											0.089	*		
											(0.036)			
Source of Insurance (ref: No Insurance)														
Provided by a Plan Sponsor													0.216	***
													(0.048)	
Self-bought													-0.020	
													(0.083)	
Female	0.712	***	0.769	***	0.786	***	0.785	***	0.792	***	0.823	***	0.775	***
	(0.049)		(0.046)		(0.046)		(0.046)		(0.046)		(0.049)		(0.046)	
Age	-0.092	***	-0.083	***	-0.082	***	-0.081	***	-0.081	***	-0.082	***	-0.080	***
	(0.008)		(0.007)		(0.008)		(0.007)		(0.008)		(0.009)		(0.007)	
Years of Education	-0.011		-0.007		-0.008		-0.008		-0.009		-0.015	*	-0.009	
	(0.006)		(0.006)		(0.006)		(0.006)		(0.006)		(0.006)		(0.006)	
Logged Income	0.027		0.030	*	0.030	*	0.029		0.035		0.034		0.029	
	(0.020)		(0.015)		(0.015)		(0.015)		(0.016)		(0.019)		(0.015)	

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Reported Zero Income	-0.160	0.033	0.027	0.020	0.066	-0.056	0.025
	(0.256)	(0.185)	(0.185)	(0.186)	(0.187)	(0.247)	(0.185)
Living in Rural Area	-0.104 *	-0.060	-0.063	-0.063	-0.057	-0.066	-0.062
	(0.050)	(0.042)	(0.042)	(0.042)	(0.042)	(0.047)	(0.042)
Insurance Interruption	-0.185 ***	-0.170 ***	-0.165 ***	-0.167 ***	-0.165 ***	-0.155 ***	-0.035
	(0.039)	(0.031)	(0.031)	(0.031)	(0.031)	(0.036)	(0.043)
Chronic Condition Diagnosis (Ever)	0.596 ***	0.570 ***	0.589 ***	0.589 ***	0.589 ***	0.559 ***	0.588 ***
	(0.062)	(0.059)	(0.060)	(0.060)	(0.060)	(0.064)	(0.059)
_cons	3.217 ***	3.075 ***	3.183 ***	3.181 ***	3.145 ***	3.195 ***	2.969 ***
	(0.281)	(0.235)	(0.238)	(0.235)	(0.235)	(0.278)	(0.239)
Obs.	9,699	16,165	16,165	16,165	16,165	12,347	16,165
Groups of obs.	3,233	3,233	3,233	3,233	3,233	3,233	3,233

1. * p<0.05, ** p<0.01, *** p<0.001

2. Standard deviation in parentheses.

Table A6. Multilevel linear regression results of correlations between psychosocial resources and times of treated when need healthcare for African American and Non-Hispanic White

	Times of Treated when Needed						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
African American (ref: Non-Hispanic White)	-0.057 **	-0.050 **	-0.046 **	-0.048 **	-0.048 **	-0.035	-0.045 **
	(0.019)	(0.017)	(0.017)	(0.017)	(0.017)	0.018	(0.017)
Depression	0.009 **						
	(0.003)	(0.025) *					
Stressful Experiences		0.010					
			(0.010)				
Marital Status			0.016				
Living Alone				0.018			
				(0.019)			
Living with Kins					0.007		
					(0.016)		

doi:10.6342/NTU202500318

Sick Leave																	-0.040	**						
																	0.014							
Source of Insurance (ref: No Insurance)																								
Provided by a Plan Sponsor																							0.091	***
																							(0.020)	
Self-bought																							0.433	**
																							(0.003)	
Female	0.055	**		0.076	***		0.078	***		0.079	***		0.077	***		0.083	***		0.075	***				
	(0.017)			(0.015)	*		(0.015)			(0.015)			(0.015)			(0.017)			(0.015)					
Age	-0.006			-0.006			-0.006	*		-0.006	*		-0.006	*		-0.005			-0.005					
	(0.003)			(0.003)			(0.003)			(0.003)			(0.003)			(0.004)			(0.003)					
Years of Education	-0.006			-0.003			-0.003			-0.004			-0.003			-0.001			-0.004	*				
	(0.003)			(0.002)			(0.002)			(0.002)			(0.002)			(0.002)			(0.002)					
Logged Income	-0.006			0.002			0.002			0.003			0.001			0.007			0.002					
	(0.008)			(0.006)			(0.006)			(0.006)			(0.006)			(0.008)			(0.006)					
Reported Zero Income	-0.002			0.082			0.079			0.086			0.075			0.109			0.082					
	(0.106)			(0.078)			(0.078)			(0.078)			(0.079)			(0.104)			(0.078)					
Living in Rural Area	0.015			0.019			0.018			0.020			0.018			0.049	**		0.019					
	(0.019)			(0.016)			(0.016)			(0.016)			(0.016)			(0.018)			(0.016)					
Insurance Interruption	-0.069	***		0.019	***		-0.058	***		-0.058	***		-0.059	***		-0.062	***		0.002					
	(0.016)			(0.016)			(0.013)			(0.013)			(0.013)			(0.015)			(0.018)					
Chronic Condition Diagnosis (Ever)	-0.069	***		0.107	***		0.110	***		0.110	***		0.110	***		0.105	***		0.110	***				
	(0.016)			(0.019)			(0.019)			(0.019)			(0.019)			(0.021)			(0.019)					
Total Needs of Healthcare	0.438	***		0.433	***		0.434	***		0.434	***		0.434	***		0.432	***		0.433	***				
	(0.004)			(0.003)			(0.003)			(0.003)			(0.003)			(0.004)			(0.003)					
_cons	0.216			0.149			0.172			0.154			0.166			0.055			0.076					
	(0.116)			(0.096)			(0.097)			(0.097)			(0.096)			(0.113)			(0.098)					
Obs.	9,699			16,165			16,165			16,165			16,165			12,347			16,165					
Groups of obs.	3,233			3,233			3,233			3,233			3,233			3,233			3,233					

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318

Table A7. Multilevel linear regression results of correlations between psychosocial resources and total perceived needs of healthcare for Hispanic and Non-Hispanic White

	Total Needs of Healthcare													
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Hispanic (ref: Non-Hispanic White)	-0.407	***	-0.405	***	-0.403	***	-0.405	***	-0.398	***	-0.395	***	-0.404	***
	(0.056)		(0.053)		(0.053)		(0.053)		(0.053)		(0.057)		(0.053)	
Depression	0.076	***												
	(0.009)													
Stressful Experiences			0.200	***										
			(0.031)											
Marital Status					0.028									
					(0.040)									
Living Alone							-0.035							
							(0.049)							
Living with Kins									-0.054					
									(0.041)					
Sick Leave											0.107	**		
											(0.037)			
Source of Insurance (ref: No Insurance)														
Provided by a Plan Sponsor													0.224	***
													(0.049)	
Self-bought													-0.005	
													(0.084)	
Female	0.694	***	0.766	***	0.774	***	0.775	***	0.781	***	0.797	***	0.767	***
	(0.049)		(0.046)		(0.047)		(0.047)		(0.047)		(0.049)		(0.047)	
Age	-0.100	***	-0.086	***	-0.086	***	-0.084	***	-0.084	***	-0.086	***	-0.083	***
	(0.009)		(0.008)		(0.008)		(0.008)		(0.008)		(0.009)		(0.008)	
Years of Education	-0.012		-0.010		-0.012	*	-0.012	*	-0.013	*	-0.017	**	-0.013	*
	(0.006)		(0.005)		(0.005)		(0.005)		(0.005)		(0.006)		(0.005)	
Logged Income	0.006	*	0.008		0.007		0.006		0.013		-0.003		0.006	
	(0.021)		(0.016)		(0.016)		(0.016)		(0.017)		(0.020)		(0.016)	

doi:10.6342/NTU202500318

Reported Zero Income	-0.390			-0.175			-0.191			-0.198			-0.153			-0.446			-0.190					
	(0.287)			(0.208)			(0.208)			(0.208)			(0.210)			(0.274)			(0.208)					
Living in Rural Area	-0.097			-0.054			-0.057			-0.056			-0.051			-0.061			-0.055					
	(0.053)			(0.044)			(0.044)			(0.044)			(0.044)			(0.049)			(0.044)					
Insurance Interruption	-0.254	***		-0.240	***		-0.233	***		-0.235	***		-0.234	***		-0.232	***		-0.098	*				
	(0.040)			(0.032)			(0.032)			(0.032)			(0.032)			(0.037)			(0.044)					
Chronic Condition Diagnosis (Ever)	0.569	***		0.530	***		0.546	***		0.546	***		0.546	***		0.514	***		0.545	***				
	(0.065)			(0.061)			(0.062)			(0.062)			(0.062)			(0.066)			(0.062)					
_cons	3.682	***		3.458	***		3.605	***		3.595	***		3.555	***		3.749	***		3.374	***				
	(0.289)			(0.242)			(0.244)			(0.243)			(0.243)			(0.284)			(0.246)					
Obs.	9,357			15,595			15,595			15,595			15,595			12,102			15,595					
Groups of obs.	3,119			3,119			3,119			3,119			3,119			3,119			3,119					

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

Table A8. Multilevel linear regression results of correlations between psychosocial resources and times of treated when need healthcare for Hispanic and Non-Hispanic White

	Times of Treated when Needed																							
	(1)			(2)			(3)			(4)			(5)			(6)			(7)					
Hispanic (ref: Non-Hispanic White)	-0.071	***		-0.066	***		-0.066	***		-0.065	***		-0.066	***		-0.052	**		-0.063	***				
	(0.020)			(0.018)			(0.018)			(0.018)			(0.018)			(0.020)			(0.018)					
Depression	0.005																							
	(0.004)																							
Stressful Experiences				0.013																				
				(0.011)																				
Marital Status							0.022																	
							(0.016)																	
Living Alone										0.033														
										(0.021)														
Living with Kins													-0.002											
													(0.017)											

doi:10.6342/NTU202500318

Sick Leave						-0.029	
						(0.015)	
Source of Insurance (ref: No Insurance)							
Provided by a Plan Sponsor							0.089 ***
							(0.021)
Self-bought							0.111 **
							(0.035)
Female	0.083 ***	0.093 ***	0.092 ***	0.095 ***	0.094 ***	0.092 ***	0.091 ***
	(0.018)	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	(0.016)
Age	-0.005	-0.007 *	-0.008 *	-0.007 *	-0.007 *	-0.008 *	-0.007 *
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
Years of Education	-0.002	-0.004 *	-0.004 *	-0.004 *	-0.004 *	-0.001	-0.005 *
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Logged Income	-0.012	-0.001	-0.001	0.001	0.000	0.005	-0.001
	(0.009)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.007)
Reported Zero Income	-0.053	0.046	0.043	0.054	0.047	0.114	0.047
	(0.121)	(0.089)	(0.089)	(0.089)	(0.090)	(0.117)	(0.089)
Living in Rural Area	0.016	0.013	0.011	0.014	0.013	0.044	0.013
	(0.021)	(0.017)	(0.017)	(0.017)	(0.017)	(0.019)	(0.017)
Insurance Interruption	-0.090 ***	-0.079 ***	-0.077 ***	-0.079 ***	-0.079 ***	-0.084 ***	-0.019
	(0.016)	(0.013)	(0.013)	(0.013)	(0.013)	(0.015)	(0.019)
Chronic Condition Diagnosis (Ever)	0.106 ***	0.110 ***	0.112 ***	0.111 ***	0.111 ***	0.102 ***	0.111 ***
	(0.024)	(0.021)	(0.021)	(0.021)	(0.021)	(0.023)	(0.021)
Total Needs of Healthcare	0.435 ***	0.430 ***	0.430 ***	0.430 ***	0.430 ***	0.428 ***	0.430 ***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
_cons	0.246 *	0.218 *	0.247 *	0.211 *	0.225 *	0.164	0.146
	(0.121)	(0.101)	(0.102)	(0.102)	(0.101)	(0.118)	(0.103)
Obs.	9,357	15,595	15,595	15,595	15,595	12,102	15,595
Groups of obs.	3,119	3,119	3,119	3,119	3,119	3,119	3,119

1. * p<0.05, ** p<0.01, *** p<0.001
2. Standard deviation in parentheses.

doi:10.6342/NTU202500318