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# The Untapped Potential of the Nurse Practitioner Workforce in Reducing Health Disparities

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**Abstract**

The growing nurse practitioner (NP) workforce represents a significant supply of primary care providers, who if optimally utilized, are well-positioned to improve access to health care for racial and ethnic minorities. However, many barriers affect the optimal utilization of NPs in primary care delivery. These barriers may also prevent NPs from maximally contributing to efforts to reduce racial and ethnic health disparities. Our review of the empirical and health policy literature sought to elucidate factors that affect NPs' potential and ability to narrow or eliminate health disparities. We found that restrictive state scope of practice regulations, disparate reimbursement policies, lack of NP workforce diversity, and poor organizational structures in NP practices may limit NPs' contributions to current efforts to reduce disparities. Our results led to the development of the nurse practitioner health disparities model which identifies barriers to and opportunities for optimal use of NPs in reducing racial and ethnic disparities. State and federal policymakers and administrators in health-care settings should take actions to remove legislative and organizational barriers to enable NPs to deliver high-quality care to racial and ethnic minorities. Researchers can use the nurse practitioner health disparities model to produce empirical evidence to reduce health disparities and improve population health.

**Keywords**

health disparities, race and ethnicity, nurse practitioner, primary care, scope of practice, reimbursement policies

Health disparities represent preventable differences in disease burden, prevalence, morbidity, and mortality that socially disadvantaged groups experience (Centers for Disease Control and Prevention, 2008). Factors such as race, ethnicity, gender, education level, income, geographic location (e.g., rural or urban), and sexual orientation define these groups. Historically, in the United States, these populations, particularly racial and ethnic minorities, have experienced poorer health outcomes than their white counterparts. Racial and ethnic minorities often experience higher disease burdens across a wide spectrum of preventive, acute, and chronic conditions. They are more likely to be unimmunized, receive care of lower quality, lack preventive services, and unnecessarily utilize emergency departments and hospitals (Ginde, Espinola, & Camargo, 2008; Shi, Chen, Nie, Zhu, & Hu, 2014; Trivedi, Zaslavsky, Schneider, & Ayanian, 2005).

Racial and ethnic minorities are also more likely to reside in medically underserved areas that lack an adequate supply of health-care professionals, which may prevent minorities from accessing timely, high-quality care (U.S. Department of Health and Human Services Health Resources and Services Administration [HRSA], 2014). Policymakers' and clinicians' efforts to connect minorities to health-care services will face difficulties as the country is experiencing a severe and growing shortage of primary care physicians (HRSA, 2016). The relatively higher compensation that physicians in

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procedural and surgical specialties earn compared with those in primary care discourages some medical students from choosing primary care specialties, further exacerbating primary care physician shortage and limiting their future supply (Laugesen & Glied, 2011). Such a shortage could impact access to and quality of care for minorities with potentially severe consequences for their health outcomes.

In contrast, the nurse practitioner (NP) workforce has grown steadily since 1992, adding roughly 6,000 NPs per year (Auerbach, 2012), and opportunities for NPs to address racial and ethnic health disparities are promising due to future NP workforce trends and projections. NP numbers are projected to increase by 93% between 2013 and 2025 totaling to 110,540 primary care NPs by 2025 (HRSA, 2016). NPs are capable of delivering safe high-quality care, and their contributions to improving patient care outcomes have been reported in a rigorous systematic review of evidence (Newhouse et al., 2011). Many NPs also provide care in communities with high concentrations of racial and ethnic minorities, where recruiting and retaining other types of primary care providers (PCPs) have traditionally been challenging (Kippenbrock, Stacy, Tester, & Richey, 2002; Xu et al., 1997).

The NP workforce represents a valuable source of human capital. NPs are well poised to meet the growing demand for primary care and helping to reduce racial and ethnic health disparities if their advanced skills and competencies are optimally utilized within the health-care system. Several organizations such as the Federal Trade Commission, National Governors Association, and the National Academy of Medicine (formerly the Institute of Medicine) recommend expansion of the NP workforce and removal of practice barriers as ways to reduce health disparities (Federal Trade Commission, 2014; Institute of Medicine, 2010; National Governors Association, 2012). To fully realize the potential of the NP workforce to address racial and ethnic health disparities, it is important to identify barriers to their providing high-quality care to minority patients. While there has been a systemtic investigation of factors affecting the NP practice in primary care and patient outcomes (Poghosyan, Boyd, & Clarke, 2016), as of May 2017, no specific investigations have examined factors that facilitate or impede the ability of NPs to provide care to racial and ethnic minorities. This critical gap in knowledge thwarts efforts to design and implement care delivery models that can effectively utilize the NP workforce to achieve reductions in health disparities.

Our review of the empirical literature and policy reports sought to elucidate factors that may impact the NP workforce's capacity to reduce racial and ethnic health disparities and resulted in the development of the nurse practitioner health disparities model. The model provides a framework to facilitate understanding of the factors potentially affecting NPs' ability to contribute to reducing health disparities enhancing efforts to guide future policy and research. We acknowledge that the dimensions of existing health disparities include factors beyond race and ethnicity. Nonetheless, due to the pervasive nature of racial and ethnic health disparities, we focus specifically on how the effective utilization of NPs may serve as a solution to reduce these disparities in health and health care. We conclude this article with a set of recommendations that might guide policymakers and administrators in using NPs to care for racial and ethnic minorities. In addition, we provide recommendations on how to utilize the nurse practitioner health disparities model in future research to produce critical evidence regarding the potential of NP workforce to reduce health disparities.

## Methods

We conducted an online literature search for studies on the role of NPs in narrowing racial and ethnic health disparities. We used the following electronic databases: Medline, PubMed, and Cumulative Index to Nursing and Allied Health Literature, and Columbia University library's ''Article Search'' function, which searches for articles across all university online databases. Google scholar was also used to identify additional studies. The search was limited to articles containing keywords in the title, abstract, and keywords sections. Examples of keywords used were *health disparities*, *race*, *ethnicity*, *minorities*, *nurse practitioners*, and *underserved*. We did not limit our search to a particular timeframe and searched for studies published in any year to assure that we included the most relevant material. However, most studies used in this article were published between 2000 and 2016. In addition, we searched for research studies conducted among registered nurses (RNs) in acute care settings and primary care physicians as more empirical studies were conducted with these providers than with NPs. We used similar search strategy by replacing ''nurse practitioner'' keyword with ''nurse'' or ''physician'' keywords. Evidence produced from these studies was also extracted.

Titles of articles were screened followed by evaluation of abstracts. We did not limit our search to empirical studies alone because our focus also was to understand policy issues documented in reports that might affect NP workforce and its potential to contribute to reduction of racial and ethnic health disparities. Although we found many policy reports emphasizing the untapped potential of the NP workforce as a solution for reducing health disparities, we found a small number of empirical studies. Such lack of empirical evidence limits our ability to

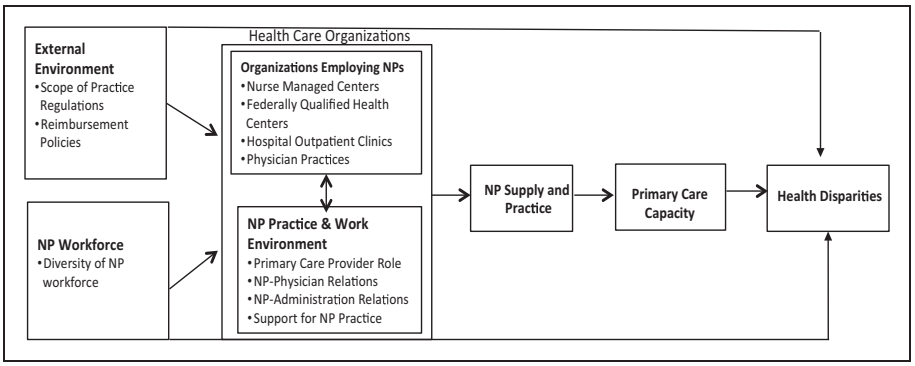


**Figure 1.** The nurse practitioner health disparities model.

conduct a systematic or a narrative review. We also included reviews of literature and research and policy reports. Each author reviewed a set of retrieved articles. We had regular discussions about the studies and the factors that emerged from the review of the studies. We achieved consensus on the final studies used to develop the results, which consist of policy recommendation papers, research studies (including original research), reviews, and reports.

## Results

Several factors emerged from the reviewed literature as potentially affecting racial and ethnic health disparities through their impact on NP supply and practice and the overall capacity of primary care. They include state NP scope of practice (SOP) regulations, public and private payer reimbursement policies, diversity of the NP workforce, and organizational structures and work contexts of health-care delivery settings that employ NPs. Figure 1 (nurse practitioner health disparities model) depicts the possible mechanisms through which these factors could influence racial and ethnic health disparities.

Each factor is listed in Table 1.

**Table 1.** Factors Limiting Nurse Practitioners' Contributions to Reducing Racial and Ethnic Health Disparities.

| |
|---|
| Restrictive state scope of practice regulations |
| Delivering care |
| Prescribing medications |
| Admitting patients |
| Ordering tests |
| Disparate reimbursement policies |
| Medicare's "incident to" billing (NPs bill under physician's name) |
| Variable medicaid reimbursement rate for NPs across states |
| Inconsistent credentialing and recognition of NPs by commercial insurers |
| Lack of diversity in Np workforce |
| Lack of diversity in RN workforce, which is a pipeline for NP workforce |
| Lack of diversity in NP workforce |
| Barriers due to organizational structures and work context |
| Organizational support and resources |
| Organizations' recognition of NPs as primary care providers |
| Work relations between NPs, other clinicians, and leadership |

### *State SOP Regulations*

The education and training for NPs which prepares them to diagnose and treat patients in addition to prescribe and order necessary medications, tests, or procedures to meet patients' needs is guided a common accreditation agency in the country (American Association of Nurse Practitioners, 2016). However, the SOP regulation for NPs, which falls under different state agencies including state boards of nursing, boards of medicine, pharmacy, and others vary from state to state (American Association of Nurse Practitioners, 2016; Barton Associates, 2017). Twenty-two states and the District of Columbia currently support NP full SOP, characterized by NPs' legal capacity to independently evaluate, diagnose, and treat patients without any regulated involvement from a physician (Robert Wood Johnson Foundation, 2017). The remaining states either reduce or restrict NP SOP by requiring NPs to have collaborative or supervisory relationships with physicians to practice. For instance, these states, NPs are not allowed to practice independently or prescribe medications without a physician's cosignature (Barton Associates, 2017). These restrictions are particularly prevalent in states where a nonnursing profession is involved in the development of NP regulations (Lugo, 2010). In 22 states, boards of nursing share the responsibility of regulating NP practice with the boards of medicine or boards of pharmacy, and the NP SOP is more restricted in these states compared with states where boards of nursing are the sole authority regulating NPs (Lugo, 2010). These inconsistent patterns in setting

NP regulations lead to wide variations in the independent practice of NPs across the states and potentially affect the ability of this workforce to help the country to meet the growing need for health-care services.

Restrictive SOP regulations for NPs can limit the supply of NPs, particularly in areas where they are the most needed, without improving quality or outcomes of care. The restrictive laws may present barriers toward optimal recruitment of NPs whereas favorable regulations may attract NPs to these states and help states to achieve better health outcomes. A 2016 study compared two states with restrictive SOP and two states with full NP SOP and found that the states with restrictive SOP had poorer health outcomes than states with full NP SOP (Sonenberg & Knepper, 2017). These states also had higher percentages of rural and Black populations and had more people receiving care through medicaid and medicare than states with full NP SOP. The authors concluded that in order to improve the outcomes of these patients, NP SOP restrictions should be removed. While this descriptive study provides important insights, other rigorous empirical studies are needed.

Another study demonstrated that full NP SOP states overall had more geographically accessible primary care NPs and NPs practicing in rural areas than primary care physicians (Graves et al., 2016). Given that many racial and minority patients live in geographically underserved areas (Gaskin, Dinwiddie, Chan, & McCleary, 2012), the removal of regulatory restrictions on NP SOP could increase access to care for these patients. For example, one study showed that states with less restrictive NP SOP regulations had a 2.5-fold greater likelihood of patients receiving primary care from NPs than states with restrictive SOP laws (Kuo, Loresto, Rounds, & Goodwin, 2013).

In another study, researchers gathered evidence on the impact of NP SOP on health-care utilization and concluded that the states allowing NPs to have greater SOP authority exhibited an increase in the number and growth of NPs and expanded NP care delivery, especially among rural and vulnerable populations (Xue, Ye, Brewer, & Spetz, 2016). Thus, evidence is supportive of removing the regulatory restrictions on NP SOP to enhance access to high-quality primary care.

### *Reimbursement Policies*

Health-care payers including medicare, medicaid, and private payers have varied mechanisms and policies for reimbursing NPs. Payers determine how and what services NPs are paid for and whether they will recognize NPs as PCPs. While both private and public payers typically must adhere to state SOP laws in their policies, some payers often impose additional restrictions (Yee, Boukus, Cross, & Samuel, 2013).

For example, Medicare reimburses NPs 85% of the physicians' fee schedule (Centers for Medicare & Medicaid Services, 2002), which might prompt physicians and other employers to use medicare's ''incident to'' billing mechanism. This billing mechanism allows organizations to bill for NP services under the physician's national provider identifier rather than using NP's national provider identifier. Such billing practice is financially beneficial for primary care practices which allows practices to receive 100% of the physician fee schedule for NP services whereas if NPs bill under their national provider identifier, the practice receives 85% of the physician fee schedule for the same services. The Centers for Medicare and Medicaid Services have specific requirements for such billing; for example, a physician must initiate certain services, a physician must be available, or patients must receive care based on the physician's care plan; however, it is not clear how practices follow these requirements (Poghosyan, Nannini, Smaldone, et al., 2013).

The medicaid payment policy for NPs varies by state (National Governors Association, 2012). While all states explicitly authorize medicaid reimbursement for NPs, in many states NPs are not explicitly authorized to be a medicaid PCP. Moreover, even if NPs are recognized as PCPs, there is a wide variability in how medicaid pays for their care. Medicaid may pay NPs from 75% to 100% of the physician fee with additional payment for rural areas (Chapman, Wides, & Spetz, 2010). Commercial insurance plans have complicated mechanisms to reimburse for NP services. Some insurance plans directly pay NPs using either physician or lower rates; other insurance plans directly pay NPs' employers (Chapman et al., 2010). However, in 2012, 25% of the largest health maintenance organizations, which offer both low-cost commercial as well as public health plans and in which members are usually required to access services from an approved list of participating providers, do not credential NPs as PCPs (Hansen-Turton, Ware, Bond, Doria, & Cunningham, 2013). Even if NPs are credentialed commercial plans usually pay for their services at a percentage of physicians' rates. Reduced reimbursements from medicaid and low-cost insurance plans may constrain the ability of NPs to provide necessary care for minority patients since many have these types of coverage (Henry J. Kaiser Family Foundation, 2015).

### *Diversity of NP Workforce*

Reduction of racial and ethnic health disparities may also be accomplished through increasing diversity in the health-care workforce (The Sullivan Commission, 2004; Villarruel, Bigelow, & Alvarez, 2014). A racially and ethnically diverse health-care workforce has been

linked to improvements in health outcomes including patient satisfaction, utilization of services, and increased adherence to treatment plans (Institute of Medicine, 2010; Meghani et al., 2009). Although more nursing workforce research is needed as most studies have been conducted among physicians (Gilliss, Powell, & Carter, 2010). Despite the established relationship between a diverse health-care workforce and minority health outcomes, the nursing profession has traditionally faced challenges in attracting individuals from underrepresented racial and ethnic groups. According to estimates from the 2008 national nurses survey, nurses from underrepresented backgrounds comprised 16% of the total RN population (HRSA, 2008). In 2015, the proportion of racial and ethnic minority RNs slightly increased reaching to 19.5% (The National Forum of State Nursing Workforce Centers, 2015). Similarly, NP workforce is largely homogeneous in terms of race and ethnicity. According to estimates from the most recent 2012 national sample survey of nurse practitioners, approximately 86% of NPs were white and non-Hispanic (HRSA, 2012). The number of minority advanced practice RNs stands in stark contrast to the demographics of the U.S. populace. According to the 2010 United States Census Bureau, data, racial and ethnic minorities are expected to steadily grow between 37% in 2010 and 57% in population in 2060 (U.S. Census Bureau, 2010). A lack of diversity among advanced practice RNs raises concerns about the ability of these nurse providers to meet the cultural and linguistic demands of 21st century patients, families, and communities.

### *Organizations Employing NPs and Work Context*

Many NPs are employed in organizations located in communities with high proportion of minorities, which face barriers to their ability to deliver necessary health-care services to patients. In particular, nurse-managed health centers and federally qualified health centers represent important care resources in minority communities, and NPs provide large share of primary care services in these settings (Hansen-Turton, Bailey, Torres, & Ritter, 2010). Nurses, mainly advanced practice RNs including NPs, often run and manage nurse-managed health centers, which provide a wide range of services to patients including complex disease management to individuals irrespective of their ability to pay (American Association of Colleges of Nursing, 2014). Federally qualified health centers, which are government-funded clinics focused on caring for underserved populations, are another safety net health-care site operating in many low-income minority urban and rural communities (Centers for Medicare & Medicaid Services, 2016) and employ about 8,000 NP providers (HRSA, 2012). Despite their role as safety net providers, both nurse-managed health centers and federally qualified health centers face funding insecurity. Nurse-managed health centers often require grant support or subsidy from private foundations to cover their expenses and deliver care to patients (Pohl et al., 2010). A 2010 study by Pohl et al. found that many nurse-managed health centers often operate at a deficit and an institution (often a school of nursing) heavily subsidizes them. Others have noted that federally qualified health centers also face similar fiscal uncertainty due to reductions in federal appropriations (Brooks Carthon, Barnes, & Sarik, 2015). Cuts in funding have derailed plans to expand federally qualified health centers, and as a result, development of new health centers have stalled (Henry J. Kaiser Family Foundation, 2012). The current economic environment poses a threat to the operation and expansion nurse-managed health centers and federally qualified health centers raising concerns over disruptions to access to care in low-resource minority communities.

Nurse-managed health centers and federally qualified health centers are not the only organizations employing NPs. NPs deliver primary care across a wide range of primary care practices that utilize NPs in care delivery. Evidence is clear that major differences exist in the parameters of NP practice from one organization to another, even within the same state (Laurant et al., 2005). For example, NPs' ability to have their own patient panels and provide continuous primary care as independent PCPs varies from across settings (Poghosyan, Nannini, Smaldone, et al., 2013). Practices typically use NPs in episodic care delivery, in team-based care models, or as independent PCPs. For example, NPs who are employed in community health centers are more likely to have their own patient panel and practice as independent PCPs compared with NPs in physician offices or clinics affiliated with hospitals (Poghosyan & Aiken, 2015).

Health-care organizations employing NPs also create a different work environment for NPs that might affect NP practice and ability to deliver high-quality care to patients. For decades, researchers have given substantial attention to the quality of work environments in health-care settings because of their direct and indirect impact on quality of care and provider and patient outcomes (Aiken et al., 2011; Kanai-Pak, Aiken, Sloane, & Poghosyan, 2008). Unfavorable work environments, characterized by lack of collegiality between different types of providers, lack of support and resources necessary for care delivery, and poor relationships between clinicians and leadership, have been linked to high levels of stress, burnout, missed care, and other adverse outcomes (Aiken et al., 2011; Brooks Carthon, Lasater, Sloane, & Kutney-Lee, 2015). Researchers also assessed the outcomes of minority patients and linked them to

quality of nurse work environments and showed that in hospitals serving higher concentration of Black patients compared with hospitals with lower concentration of black patients, patients are dissatisfied with the quality of care (Brooks Carthon, Lasater, Rearden, Holland, & Sloane, 2016; Brooks Carthon, Kutney-Lee, Jarrín, Sloane, & Aiken, 2012), and one of the factors explaining patient dissatisfaction is poor nurse work environments (Brooks Carthon, Kutney-Lee, Sloane, Cimiotti, & Aiken, 2011). These findings suggest that nurses play an important role in perceptions of care quality and that the work environment represents a pathway through which minority patient outcomes may be influenced.

Research shows that NP work environments are often characterized by a lack of understanding of NP role and poor relationships between NPs and physicians or NPs and administrators. These organizational challenges are experienced both by newly hired NPs as well as by NPs who have been practicing in their organizitions for longer periods of time (Poghosyan, Norful, & Martsolf, 2017). NPs often feel their role is invisible and that they do not receive a similar level of support as physicians (Bryant-Lukosius, DiCenso, Browne, & Pinelli, 2004; Poghosyan, Nannini, Stone, et al., 2013) although NPs and physicians often have similar PCP roles. For example, physicians may have dedicated medical assistant support whereas NPs might not receive the same help to care for patients (Poghosyan Nannini, Stone, et al., 2013). This lack of support causes NPs to take on tasks typically delegated to medical assistants or RNs, leading to the underutilization of NPs' advanced skills. One study estimated that lack of staff support for NPs could increase the cost of care for patients by 9% to 12% and lead to delays in appointment scheduling (Liu, Finkelstein, & Poghosyan, 2014). Ineffective communication between NPs and physicians characterized by a lack of respect, collegiality, or support for NP practice within organizations are factors that may exacerbate barriers to NP care provision (De Milt, Fitzpatrick, & McNulty, 2011; Poghosyan et al., 2015; Weiland, 2008).

On the other hand, favorable relationships characterized by knowledge sharing and similar visions of prioritizing care and teamwork are factors that facilitate a positive work environment for NPs (Hallas, Butz, & Gitterman, 2004; Poghosyan & Liu, 2016; Poghosyan, Boyd, & Knutson, 2014). Managerial promotion of NP professional and practice development as well as involving NPs in organizational governance were found to facilitate positive and supportive work environment (Ackerman, Mick, & Witzel, 2010; Poghosyan, Nannini, Stone, et al., 2013). In summary, although we did not find emperical studies directly linking NP work environments and organizational structures to racial and ethnic health disparities and outcomes, the reviewed studies provide insights on how the environments of organizations employing NPs might exacerbate racial and ethnic health disparities. They also point to gaps in evidence and needs for future research.

## Discussion

We conducted a thorough investigation of literature to better understand factors that may affect the potential of the NP workforce to contribute to the reduction of racial and ethnic health disparities. We grouped the factors into the nurse practitioner health disparities model to aid their conceptualization and demonstrate the mechanisms through which each factor may impact racial and ethnic health disparities. Identifying these factors is important because federal and state policymakers, private insurers, and health-care administrators can modify them through targeted policy and practice interventions. In addition, identifying these factors may promote the generation of research questions for future empirical investigations to produce timely evidence to aid efforts to eliminate racial and ethnic health disparities, a national priority. The removal of these barriers holds promise for increasing access to care for minority patients. We found that restrictive NP SOP policies, disparate reimbursements policies, lack of workforce diversity, and poor organizational structures and work context in the employment settings of NPs can produce unwanted health consequences for minority patients by restricting NP practice and supply in minority communities and limit the overall capacity of the primary care system in the most needed areas of the country. Our findings have important policy, practice, and research implications.

### *Implications for Policy*

Restrictive SOP regulations may discourage NPs from practicing in all parts of the state; however, they ultimately may deprive areas with the greatest need (e.g., minority communities, etc.), which depend on a physician workforce that does not gravitate to these areas despite funding and policy incentives (Xu et al., 1997). In recent years, many states have eased the SOP restrictions on NP practice to address the misdistribution of primary care services, and the states still with restrictive SOP can follow these states to assure their residents, particularly racial and ethnic minorities have access to primary care services.

The low representation of racial and ethnic minority RNs and NPs in the current nursing workforce may also create challenges for effectively targeting and eliminating racial and ethnic health disparities. Health-care professionals from underrepresented backgrounds bring diverse perspectives to care for patients, enhance culturally competent care, and are more likely to work in

minority communities (Betancourt, Green, Carrillo, & Ananeh-Firempong, 2003). They are often able to mitigate feelings of alienation and frustration with the health-care system as many members of minority communities express such frustration (Meghani et al., 2009). Many racial and ethnic minorities have experienced overt discrimination or bias from the health-care system and providers, often leading to mistrust and in some instances avoidance of health-care services (Armstrong et al., 2008; Williams & Wyatt, 2015). Policies should be targeted toward increasing the pool of RNs from underrepresented backgrounds, which serves as the pipeline for the NP workforce, and increasing the diversity of the NP workforce as recommended by the Institute of Medicine (2010) to offer opportunities to improve the quality of care for minorities and enhance the trust and rapport building between these providers and their patients.

Reimbursement policies also create challenges for effective utilization of NPs to care for minority patients. Disparate reimbursement policies, where NPs are reimbursed at lower rate than primary care physicians delivering the same services, or NPs' billing for their services under physician's national provider identifier create several challenges for the NP workforce and patients. First, this kind of billing system does not allow tracking and evaluation of NP care. Second, it limits the American public's right to see quality care indicators for providers who actually delivered the care. Third, this billing practice does not create financial incentives for organizations to hire and retain NPs as independent PCPs especially in practices where NPs are most needed. Lastly, it creates challenges to care for minority patients who might require large quantities of care and continuous monitoring and follow-up. Practices with many NPs might not accept minority patients given third-party payers' low-payment rate for NPs. Thus, focusing on reforming reimbursement policies to allow all providers, including NPs, to be accountable for the care they deliver and creating financial incentives for practices serving minority patients may attract and retain the NP workforce to care for minority patients.

## *Implications for Practice*

The expansion of NP practice ultimately depends on the willingness of organizations to hire and retain NPs and promote their care. Many NPs employed in primary care practices lack their own patient panel to deliver comprehensive care. This not only limits NP practice but also challenges the quality and continuity of primary care. A key aspect of primary care is to provide care that extends beyond episodes of illness, which is critical to achieve positive patient outcomes, particularly among patients with chronic illness. Studies consistently show that continuity of primary care improves patient outcomes (Cabana & Jee, 2004; Fan, Burman, McDonell, & Fihn, 2005). NPs who practice as independent PCPs in their employment settings are able to deliver comprehensive continuous care to their patients. Such utilization of NPs in minority practices will harness NPs' advanced skill sets and allow them to effectively use their full SOP to care for patients. Only when primary care practices utilize NPs as independent PCPs can they operate at a more productive level, enabling practices to reduce racial and ethnic health disparities. Thus, organizations should assign NPs their own patient panel.

Organizations also play a vital role in creating structures that promote effective care delivery by NPs. Environments in which NPs work may be major barriers to achieving reductions in health disparities. When NP work environments are suboptimal in structure and function, NPs may be unable to effectively utilize their skills and knowledge to provide high quality, cost-effective patient care, especially in practices that are located in minority communities that are known to have scarce resources and inadequate infrastructure for care delivery. Focusing on promoting NP practice within the organizations employing NPs can be an effective strategy to increase the capacity of primary care. Administrators can take action to improve work relations within their organizations and provide NPs with adequate support.

## *Implications for Research*

The nurse practitioner health disparities model demonstrates the possible mechanisms through which each component of the model may influence racial and ethnic health disparities. While studies conducted with RNs or primary care physicians provide important insights to increase awareness of possible challenges that may limit the potential of NPs to maximally contribute to health disparities reduction efforts, NP-specific empirical studies are needed to guide policy and practice decisions. Researchers can use the nurse practitioner health disparities model to guide future research studies focused on testing the relationships identified in the model in empirical studies. Such studies can produce valuable and timely evidence for reforms and innovations. For example, future research studies could test the long-term impact of removing regulatory restrictions on NP practice on the supply of NPs within the states and in minority communities. If such studies show that removing regulatory restrictions on NPs indeed increases the supply of NPs in underserved areas, then policymakers in the 29 states can use this evidence to encourage removal of the regulatory restrictions in their states. Similarly, more research is needed to understand the degree to which minorities are cared for in primary care practices with poor organizational

structures and NP work environments and the effect of these differences on racial and ethnic health disparities. If differences in organizational structures and NP work environments are found to be associated with health disparities, then interventions could be targeted to practices serving minority patients. Such findings will inform administrators and policymakers seeking ways to reduce disparities through workforce management and organizational transformation strategies. This evidence is invaluable for developing interventions to improve NP work environments, enhance care delivery, and reduce persistent racial and ethnic health disparities facing our nation. Similarly, researchers can study how to attract nurses from minority groups to advanced practice nursing roles or how to motivate these providers to deliver care in minority practices. Answers to such research questions can be of interest to many organizations, including the national institutes of health, which regularly seek innovative research to reduce racial and ethnic health disparities. Racial and ethnic health disparities are one of the biggest challenges facing the United States, and evidence is needed to support comprehensive strategies to eliminate the barriers identified in our model to effectively utilize NPs to meet the primary care needs of millions of minority patients. In this article, we only focused exploring the potential of NP workforce to reduce racial and ethnic health disparities, future research should focus on exploring how NPs can reduce health disparities among other populations such as those living in low-income or rural communities.

### *Limitations*

The review has several limitations. Lack of empirical studies conducted among NPs limits our ability to only select empirical studies. In addition, while we found many policy reports on the critical role of NPs in reducing health disparities, we did not find empirical studies particularly looking at how NP care reduces racial and ethnic health disparities. Our model can guide the production of future empirical work. Also, the lack of empirical studies did not allow us to conduct a systematic or integrative review with rigorous methodologies. Although we conducted a thorough search for studies, it is possible that we might have missed other studies. Despite these limitations, the results and the nurse practitioner health disparities model have significant potential to be used in future research, practice, and policy efforts to assure effective utilization of NPs to reduce racial and ethnic health disparities.

## Conclusions

In this article, we assessed the existing evidence on factors affecting the NP workforce and identified the potential mechanisms through which these factors may impact racial and ethnic health disparities. We found that restrictive SOP regulations, disparate reimbursement policies, lack of diversity in nursing workforce, and organizational structures and work contexts in the settings employing NPs may challenge NPs' maximum contributions to reducing racial and ethnic health disparities. Policymakers, administrators, and clinicians should focus on these factors and take actions to addresses these challenges. Future work can empirically test the mechanisms in the nurse practitioner health disparities model to provide evidence for actions to reduce health disparities.

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