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## Supportive Clinical Practice Environments Associated With Patient-Centered Care

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### Abstract

A lack of organizational supports in clinical settings may prevent nurse practitioners from providing patient centered care. Using a cross sectional survey design, data were collected from NPs in 1,571 practices across four states to investigate clinical practice environments and the extent to which they are associated with NP integration of patient preferences. Three-quarters of NPs reported frequent integration of patient preferences into clinical care. Overall, 371 practices (23.6%) were classified as good practice environments; the remaining 76.3% were mixed or poor environments. NPs in good environments were significantly more likely to integrate patient preferences (O.R. = 2.3,  $p < .001$ ).

### Keywords

patient centered care; nurse practitioners; patient preferences; practice environments

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## INTRODUCTION

In 2001, The Institute of Medicine released its seminal report, *Crossing the Quality Chasm*, which identified patient centered care as a core tenant of health care quality.<sup>1</sup> Patient centered care, defined as care delivery that respects and integrates the wants needs and preferences of patients into goal setting and treatment, has been linked to higher ratings of satisfaction, and improved health outcomes.<sup>2</sup> The National Quality Forum and Centers for Medicare and Medicaid Services have designated the delivery of patient centered care as a quality measure and insurance payments are increasingly linked to it.<sup>3,4</sup> Despite its value, several barriers impede the delivery of patient centered care including, a lack of clinician time and limited reimbursement incentives.<sup>5,6</sup> Level of clinician education or racial and ethnic discordance barriers impede the delivery of patient centered care including, a lack of clinician time and limited reimbursement incentives.<sup>5,6</sup> Level of clinician education or racial and ethnic discordance between patients and providers may also influence the extent to which patient preferences are integrated into care.<sup>7,8</sup> To date, much of the evidence pertaining to patient centered care delivery has focused on physicians, leaving unanswered questions about barriers to the delivery of patient centered care among other health care providers.<sup>2,9</sup> The current study purposely takes as its focus nurse practitioners (NPs). Recent estimates suggest that there are over 200,000 licensed NPs in the U.S. who provide up to one billion visits annually.<sup>10</sup> The number of NPs providing primary care is only expected to increase as more consumers seek preventative and chronic disease management services and the nation faces a persistent shortage of physicians entering primary care practice.<sup>11</sup> Despite the growth in the NP workforce, constraints in their clinical practice environments may limit their ability to provide patient centered care.<sup>12,13</sup>

### Background: The Role of Organizational Support

The clinical practice environment is characterized as the social and organizational structure operating in the workplace, which collectively impacts the job performance and productivity of employees.<sup>14,15</sup> The systems, norms and management mechanisms of clinical practices can increase or decrease specific behaviors such as patient engagement or the delivery of patient centered care.<sup>6</sup> The clinical practice environment of nurses has long been linked to patient and nurse job outcomes, both in the U.S. and internationally.<sup>16,17</sup> For the NP workforce, a growing evidence base suggests that when the practice environment of a clinical setting is favorable, NPs have greater autonomy over their practice, substantial managerial support, and excellent working relationships with physicians – all of which empower them to act on behalf of patients.<sup>18</sup> For example, a study by Poghosyan and colleagues found that a supportive clinical practice environment increased the likelihood that NPs independently cared for their own panel of patients.<sup>19</sup> In a separate study, researchers noted that clinical practices with better working relationships between NPs and administrators increased the provision of asthma medication management.<sup>20</sup> In both studies the level of clinical autonomy and care delivered by NPs was directly associated with the organizational culture of the setting where care was provided.

The current study builds on prior evidence linking health care delivery to organizational culture and seeks to:

1. determine the extent to which NPs routinely integrate patient's needs and preferences into care and;
2. evaluate if NP integration of patient's needs and preferences into care is associated with characteristics of the practice environments where they are employed.

To accomplish our aims, we evaluated survey responses of NPs working in over 1,500 practices who were asked how frequently they integrate patient preferences into care. The Picker Institute has identified eight dimensions of patient centered care: (a) respect for patient preferences, values and expressed needs; (b) education and communication; (c) coordination and integration of care and services; (d) provision of emotional support; (e) physical comfort; (f) involvement of family and friends; (g) continuity and transition; and (h) access to care and services. An examination of each dimension of patient centered care is beyond the scope of this project, instead here we focus solely on NP assessments of their ability to integrate patient's needs and preferences into treatment, which is arguably one of the most important dimensions for patient centered care.<sup>21,22</sup>

## Methods

### Design

We conducted a cross-sectional analysis of survey data produced from 1,783 NPs practicing across 1,571 practices in four U.S. states (California, Florida, New Jersey, and Pennsylvania) to examine the relationship between integration of patient preferences and NP practice environments.

### Sample

**Nurse Practitioners**—Nurse practitioners licensed in four states (CA, FL, NJ, and PA) were surveyed in 2016 through the RN4CAST-US. These four states comprise over 20% of the U.S. population, and include both urban and rural areas.<sup>23</sup> Lists of actively licensed NPs and their home addresses were obtained from State Board of Nursing mailing lists. Using a modified Dillman methodology, surveys and reminder postcards were mailed to the homes of a state-based random sample (50%) of actively licensed NPs, yielding a 30% response rate (n=6,539).<sup>24,25</sup> We restricted our sample to those NPs who reported working in a primary care setting and answered questions regarding the practice environment and integrating patient preferences into care (n=1,783). Our selection of sites was based on prior work that identified NP primary care settings as: physician offices, home health, community health/clinics, health departments, long-term care or hospice, school health, hospital outpatient departments, nursing offices, correctional facility or Veterans Affairs/Department of Defense clinics.<sup>26</sup> Institutional Review Board approval for the study was obtained from the Human Subjects Review Committee at the University of Pennsylvania.

### Setting

**Primary Care Practices**—Nurse practitioners were asked to identify their practice type (e.g. physician office, community health center, home health, hospital-based ambulatory), practice address, number of NPs in their organization, and daily patient volume. On average,

there were 1.1 NPs per practice (range: 1–16 NPs per practice). Rural-urban commuting area (RUCA) codes were utilized to classify practices as urban or rural.<sup>27,28</sup>

## Measures

The primary variables of interest for this investigation included the practice environment of NPs working in primary care settings and reports of NP integration of patient preferences.

### Dependent Variable (measured at the NP level)

**Integration of Patient Preferences**—Integration of patient preferences was measured at the individual NP-level by a single survey item that asked the following global question: *I integrate the cultural needs and preferences of my patients into treatment and care.* This global measure was developed and adapted from one of the Picker Institute’s previously defined dimensions of patient centered care<sup>21,22</sup> and items on the Health Care Provider Cultural Competence Instrument.<sup>29</sup> Response options included a Likert scale with the response options of: *frequently, occasionally, rarely or never.* To ease the interpretation and differentiate NPs who integrated patient needs and preferences into care from those who do not, we dichotomized the responses of NPs on this item to distinguish those who responded “*frequently*” from those who responded “*occasionally, rarely, or never.*”

### Independent Variables (measured at the practice level)

**Nurse Practitioner Practice Environment**—The NP practice environment was measured using the Nurse Practitioner Primary Care Organizational Climate Questionnaire (NP-PCOCQ), which was included in our RN4CAST-US survey.<sup>30</sup> The NP-PCOCQ is a validated measure of the NP practice environment and consists of 29 items that ask NPs to rate the degree to which they agree or disagree that certain characteristics are present in their work settings using a 4-point scale (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree).<sup>30</sup> The NP-PCOCQ has construct, discriminate, and predictive validity.<sup>31</sup> The tool has four subscales with high internal consistency reliability. The NP-Physicians Relations subscale includes seven items and measures the NP’s collegiality with physicians (Cronbach’s alpha = 0.86). The nine item NP-Administration Relations subscale measures the NP’s sense of the relationship they have with their organizational administrators (Cronbach’s alpha = 0.95). The Independent Practice and Support subscale includes nine items and measures the degree to which the NP is able to practice up to scope and is supported by the organization and staff to do so (Cronbach’s alpha = 0.82). The Professional Visibility subscale includes four items and measures the degree to which the NP role is understood within the organization (Cronbach’s alpha =0.85).

We computed individual NP-level mean scores for each of the four subscales of the NP-PCOCQ for those who completed more than 70% of the scale items and then aggregated the scores of all NPs from each practice to compute practice-level subscale scores.<sup>32</sup> Practices with all four subscales above the median were classified as “good,” practices with two or three subscales above the median were classified as “mixed,” and those with one or none of the subscales above the median were classified as “poor” NP practice environments.<sup>16,33</sup>

**Covariates**—Characteristics of NPs served as controls in our analysis and included age, years of experience as a registered nurse (RN) and as a NP, years in their current position, sex, ethnicity, race, whether English was their first language, and whether they worked full time. These characteristics have been shown to be significantly related to outcomes in prior research.<sup>16</sup> We also accounted for the type of practice (e.g. physician office, community health center), the location (urban vs. non-urban) of the practice, daily patient volume and state in our models.<sup>34</sup>

## Data Analysis

We conducted descriptive analyses to describe the distribution of NP and practice characteristics for our sample using means for continuous variables and frequencies and percentages for categorical variables. Nurse practitioners who frequently integrated patient preferences into care and those who did not, were compared on each independent variable using t-tests for continuous data and chi-square tests for categorical data. We used multilevel logistic regression that accounted for the clustering of NPs in practices and included independent variables with significant differences at the  $p < .20$  level to predict integration of patient preferences.<sup>19</sup> Significance was set at a  $p$ -value  $< .05$  and all analyses were conducted using STATA 15 (College Station, Texas).

## Results

### Sample Characteristics

Tables 1 and 2 depict the characteristics of the NP sample ( $n = 1,783$ ). Nurse practitioners were primarily female (91.8%) and white (86.3%) and on average 49.1 years old ( $SD = 10.9$ ) with 13.4 years of NP experience ( $SD = 9.4$ ). The demographic characteristics of the study participants were comparable to the demographics of the 2012 National Sample Survey of NPs (NSSNP).<sup>35</sup> In the NSSNP 3% of NPs were Latino, whereas in our sample 6.0% were, which is reflective of the states sampled having somewhat higher Latino populations than the U.S. as a whole.<sup>23</sup> The majority of NPs practiced in urban settings (94.2%) and worked in physician/NP offices (66.2%) with about half working in a practice with fewer than five NP colleagues (48.9%). The average number of patients seen daily was 16.9 ( $SD = 10.4$ ).

Across our sample over three-quarters of NPs reported frequently integrating patient preferences in their care. Nurse practitioners who frequently integrated patient preferences had more years of RN experience (21.0 vs. 18.7 years,  $p < .001$ ). Latino NPs (83.0%) integrated patient preferences more frequently than non-Latino white NPs (73.9%,  $p = .037$ ). Black (89.3%) and Asian NPs (84.0%) were also significantly more likely to frequently integrate patient preferences into care compared to white NPs (74.3%,  $p = .003$ ). Nurse practitioners who spoke English as a second language were also more likely to frequently integrate patient preferences than NPs who spoke English as their primary language (87.3% vs 74.8 %,  $p < .001$ ). There were no significant differences in integration of patient preferences across NPs related to their years of experience as an NP, years in their current position, sex, or whether they worked full time.

Nurse practitioners who frequently integrated patient preferences worked in larger organizations; 80.6% of those working in organizations with over 20 NPs frequently integrated patient preferences versus 71.8% of those working in organizations with <5 NPs ( $p < .001$ ). Nurse practitioners working in home health and community clinics were more likely to frequently integrate patient preferences into care than those working in physician/NP offices (86.0%, 85.9%, and 72.9% respectively,  $p < .001$ ). Frequent integration of patient preferences was more common for NPs practicing in urban areas (76.6%) than for those working in non-urban areas (64.0%,  $p = .004$ ). Nurse practitioner's integration of patient preferences into care did not differ by daily patient volume.

### Differences in Integration of Patient Preferences across Practice Settings

The organizational practice environment was assessed at the practice-level using the NP-PCOCQ<sup>30</sup> and categorized into three levels.<sup>16,33</sup> The distribution of the practice environment is displayed in Table 3. Almost half (46.1%) of NPs worked in a poor practice environment. Nurse practitioners who worked in a good practice environment were significantly more likely to integrate patient preferences into care compared to those working in a mixed or poor environment (84.0%, 77.6%, and 71.1% respectively,  $p < .001$ ).

### Association of NP Practice Environments and the Integration of Patient Preferences

Table 4 presents the results of the logistic regression model used to predict the likelihood, or odds, of NPs integrating patient preferences in care. Our fully adjusted logistic regression model accounted for NP and practice characteristics that were significant at  $p < .20$  in the bivariate analyses. Compared to NPs working in poor practice environments, those working in mixed and good practice environments were 1.4 ( $p = .037$ ) and 2.3 times ( $p < .001$ ), respectively, more likely to frequently integrate patient preferences into care.

## Discussion

Our study found that NPs in practice environments with favorable organizational support were more than twice as likely to integrate patient preferences into care. This finding has important implications as it suggests that *where NPs work* influences, at least in part, *how they work*. Clinical settings with good practice environments are characterized by adequate resources, and better relationships with other members of the health care team and administration. In these settings, NPs work more autonomously and are enabled to guide care that is tailored and relevant to the individual, family, or community.

Our study is not the first to note variation in integration of patient preferences across clinical settings.<sup>2,36</sup> Others have found that a lack of time, reimbursement or supportive practice environments each contributed to lower rates of incorporating patient preferences into care.<sup>37</sup> In their study of 34 primary care practices for example, Freidberg and colleagues found that overworked and busy physicians were less likely to elicit patient preferences during treatment planning and the decision-making process.<sup>38</sup> Health care systems or practices that enact a volume-based incentive model may do so at the expense of providers forming meaningful relationships with patients and eliciting their preferences, which may require more time. Similarly, NPs working without adequate staffing and resources, may be hard



pressed to prioritize the individual needs of their patients during the course of a 15-minute problem-focused visit.

In addition to time demands, patient centered care may also be constrained due to other organizational factors, including a lack of buy-in from administration and managers. We suspect that in good practice environments, office managers and physicians recognize NPs as valued members of the interprofessional team. Settings that enable a range of interprofessional members of the health care team in care planning, goal setting and treatment planning have been more successful in developing a patient centered culture.<sup>39</sup> Some studies however, note that this does not always occur. A recent study of over 500 NPs working in primary care found strained relationships between NPs and administrators. In these settings, there was a lack of organizational support for NPs and inconsistencies with how administrators communicated with NPs, resulting in misunderstanding of the NP role and subsequent under-utilization.<sup>13</sup> The delivery of patient centered care is dependent on each member of the health care team practicing to the top of their license. Organizations that constrain NP practice fall counter to innovative models of care delivery that emphasize maximizing the value of team members across all levels of the delivery system.<sup>40</sup>

We emphasize the organizational supports offered in NP clinical settings because unlike the size or location of practices, clinical environments represent modifiable aspects of health care organizations.<sup>6</sup> In busy primary care practices, a NP's ability to assess the individual preferences of patients and integrate this knowledge into care is likely determined by adequate resource allocation and collaborative interprofessional relationships.<sup>41</sup> Addressing these aspects of organizational culture represents actionable strategies that can help facilitate NP delivery of patient centered care.

## Limitations

Due to the cross-sectional nature of the study, we are limited in our ability to determine causality. Our survey included responses from NPs practicing in four states, however, these states comprise 20% of the U.S. population and NP demographics were comparable to the 2012 National Sample Survey of Nurse Practitioners.<sup>35</sup> Surveys of employees providing feedback on working conditions raise concerns over potentially biased response. In our case, respondent bias was minimized by sending the survey directly to the homes of NPs versus sending the survey to their site of employment.<sup>42</sup> Finally, our measure of integration of patient preferences was based on the responses of NPs, which may differ from the perceptions of patients engaged in the same clinical encounter. However, having NPs' reflect on their provision of patient centered care is an example of self-assessment, which allows them to reflect on their individual care delivery within the context of their own clinical practices.<sup>29</sup>

## Conclusion

Clinical practice environments are modifiable and targeted investments in the supports offered to NPs in their practice settings may be key factors in achieving patient centered care. Addressing the organizational and structural constraints operating in NP workplaces offers a promising mechanism to facilitate the integration of patient preferences into care.

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## References

1. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington (DC): The National Academies Press; 2001.
2. Epstein RM, Street RL. The Values and Value of Patient-Centered Care. *Ann Fam Med*. 2011;9(2):100–103. doi: 10.1370/afm.1239 [PubMed: 21403134]
3. National Quality Forum. Priority Setting for Healthcare Performance Measurement: Addressing Performance Measure Gaps in Person-Centered Care and Outcomes. 2014 [https://www.qualityforum.org/Publications/2014/08/Priority\\_Setting\\_for\\_Healthcare\\_Performance\\_Measurement\\_\\_Addressing\\_Performance\\_Measure\\_Gaps\\_in\\_Person-Centered\\_Care\\_and\\_Outcomes.aspx](https://www.qualityforum.org/Publications/2014/08/Priority_Setting_for_Healthcare_Performance_Measurement__Addressing_Performance_Measure_Gaps_in_Person-Centered_Care_and_Outcomes.aspx)
4. Centers for Medicare and Medicaid Services. Overview of the CMS meaningful Measure Initiative. 2018; <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/CMS-Quality-Strategy.html>.
5. Shaller D Patient-Centered Care: What Does It Take? 2007 [https://www.commonwealthfund.org/sites/default/files/documents/\\_\\_\\_media\\_files\\_publications\\_fund\\_report\\_2007\\_oct\\_patient\\_centered\\_care\\_\\_what\\_does\\_it\\_take\\_shaller\\_patient\\_centeredcarewhatdoesittake\\_1067\\_pdf.pdf](https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_fund_report_2007_oct_patient_centered_care__what_does_it_take_shaller_patient_centeredcarewhatdoesittake_1067_pdf.pdf)
6. Sinaiko AD, Szumigalski K, Eastman D, Chien AT. Delivery of Patient Centered Care in the U.S. Health Care System: What is standing in its Way? 2019 [https://www.academyhealth.org/sites/default/files/deliverypatientcenteredcare\\_august2019.pdf](https://www.academyhealth.org/sites/default/files/deliverypatientcenteredcare_august2019.pdf)
7. Epstein RM, Fiscella K, Lesser CS, Stange KC. Why the nation needs a policy push on patient-centered health care. *Health Aff*. 2010;29(8):1489–1495, 10.1377/hlthaff.2009.0888
8. Shen MJ, Peterson EB, Costas-Muniz R, et al. The effects of race and racial concordance on patient-physician communication: A systematic review of the literature. *J Racial Ethn Health Disparities*. 2017 10.1007/s40615-017-0350-4
9. Chang A, Ritchie CJ. Patient-centered models of care: Closing the gaps in physician readiness. *J Gen Intern Med*. 2015;30(7):870–872. doi: 10.1007/s11606-015-3282-x [PubMed: 25801696]
10. American Association of Nurse Practitioners. NP Fact Sheet. 2019; <https://www.aanp.org/about/all-about-nps/np-fact-sheet>.
11. Buerhaus PI, DesRoches CM, Dittus R, Donelan K. Practice characteristics of primary care nurse practitioners and physicians. *Nurs Outlook*. 2015;63(2):144–153. doi: 10.1016/j.outlook.2014.08.008 [PubMed: 25261383]
12. Poghosyan L, Shang J, Liu J, Poghosyan H, Liu N, Berkowitz B. Nurse practitioners as primary care providers: Creating favorable practice environments in New York State and Massachusetts. *Health Care Manage Rev*. 2015;40(1):46–55. doi: 10.1097/HMR.000000000000010 [PubMed: 24727678]
13. Poghosyan L, Aiken LH. Maximizing nurse practitioners' contributions to primary care through organizational changes. *J Ambul Care Manage*. 2015;38(2):109–117. doi: 10.1097/JAC.000000000000054 [PubMed: 25748259]
14. Kanter RM. The impact of hierarchical structures on the work behavior of women and men. *Social Problems*. 1976;23(4):415–430.
15. Litwin GH, Stringer RA. Motivation and Organizational Climate. Division of Research, Graduate School of Business Administration, Harvard University; 1968.
16. Aiken LH, Clarke SP, Sloane DM, Lake ET, Cheney T. Effects of hospital care environment on patient mortality and nurse outcomes. *J Nurs Adm*. 2008;38(5):223. doi: 10.1097/01.NNA.0000312773.42352.d7 [PubMed: 18469615]



17. Aiken LH, Sloane DM, Bruyneel L, Van den Heede K, Sermeus W, Consortium RC. Nurses' reports of working conditions and hospital quality of care in 12 countries in Europe. *Int J Nurs Stud*. 2013;50(2):143–153. doi: 10.1016/j.ijnurstu.2012.11.009 [PubMed: 23254247]
18. Poghosyan L, Nannini A, Clarke S. Organizational climate in primary care settings: Implications for nurse practitioner practice. *J Am Assoc Nurse Pract*. 2013;25(3):134–140. doi: 10.1111/j.1745-7599.2012.00765.x [PubMed: 24218200]
19. Poghosyan L, Liu J, Norful AA. Nurse practitioners as primary care providers with their own patient panels and organizational structures: A cross-sectional study. *Int J Nurs Stud*. 2017;74:1–7. doi: 10.1016/j.ijnurstu.2017.05.004 [PubMed: 28577459]
20. Poghosyan L, Norful AA, Liu J, Friedberg MW. Nurse practitioner practice environments in primary care and quality of care for chronic diseases. *Med Care*. 2018;56(9):791–797. doi: 10.1097/MLR.0000000000000961. [PubMed: 30015724]
21. Berghout M, van Exel J, Leensvaart L, Cramm JM. Healthcare professionals' views on patient-centered care in hospitals. *BMC Health Serv Res*. 2015;15(1):385. doi: 10.1186/s12913-015-1049-z. [PubMed: 26373841]
22. Gerteis M *Through the Patient's Eyes: Understanding and Promoting Patient-centered Care*. 1993.
23. U. S. Census Bureau. National Population Totals and Components of Change: 2010–2018. 2019; <https://www.census.gov/data/tables/time-series/demo/popest/2010s-national-total.html>.
24. Dillman DA. *Mail and Telephone Surveys: The Total Design Method*. New York: John Wiley & Sons, Inc.; 1978.
25. Cimiotti JP, Li Y, Sloane DM, Barnes H, Brom HM, Aiken LH. Regulation of the nurse practitioner workforce: Implications for care across settings. *J Nurs Regul*. 2019;10(2):31–37. doi: 10.1016/S2155-8256(19)30113-9
26. Spetz J, Fraher E, Li Y, Bates T. How many nurse practitioners provide primary care? It depends on how you count them. *Med Care Res Rev*. 2015;72(3):359–375. doi: 10.1177/1077558715579868 [PubMed: 25854959]
27. U. S. Department of Agriculture Economic Research Service. Rural-Urban Commuting Area Codes. 2016; <https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes/>.
28. Hart LG, Larson EH, Lishner DM. Rural definitions for health policy and research. *Am J Public Health*. 2005;95(7):1149–1155. doi: 10.2105/AJPH.2004.042432 [PubMed: 15983270]
29. Schwarz JL, Witte R, Sellers SL, et al. Development and psychometric assessment of the healthcare provider cultural competence instrument. *Inquiry*. 2015;52:1–8. doi: 10.1177/0046958015583696
30. Poghosyan L, Nannini A, Finkelstein SR, Mason E, Shaffer JA. Development and psychometric testing of the Nurse Practitioner Primary Care Organizational Climate Questionnaire. *Nurs Res*. 2013;62(5):325–334. doi: 10.1097/NNR.0b013e3182a131d2 [PubMed: 23995466]
31. Poghosyan L, Chaplin WF, Shaffer JA. Validation of nurse practitioner primary care organizational climate questionnaire: A new tool to study nurse practitioner practice settings. *J Nurs Meas*. 2017(1):142–155. doi: 10.1891/1061-3749.25.1.142 [PubMed: 28395705]
32. Poghosyan L, Liu J. Nurse practitioner autonomy and relationships with leadership affect teamwork in primary care practices: A cross-sectional survey. *J Gen Intern Med*. 2016;31(7):771–777. doi: 10.1007/s11606-016-3652-z [PubMed: 26951282]
33. McHugh MD, Kutney-Lee A, Cimiotti JP, Sloane DM, Aiken LH. Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Aff*. 2011;30(2):202–210. doi: 10.1377/hlthaff.2010.0100
34. Lebrun LA, Shi L, Zhu J, et al. Racial/ethnic differences in clinical quality performance among health centers. *J Ambul Care Manage*. 2013;36(1):24–34. doi: 10.1097/JAC.0b013e3182473523 [PubMed: 23222010]
35. Health Resources & Services Administration. Highlights from the 2012 National Sample Survey of Nurse Practitioners. 2014 <https://bhw.hrsa.gov/sites/default/files/bhw/nchwa/npsurveyhighlights.pdf>
36. Benkert R, Templin T, Schim SM, Doorenbos AZ, Bell SE. Testing a multi-group model of culturally competent behaviors among underrepresented nurse practitioners. *Res Nurs Health*. 2011;34(4):327–341. doi: 10.1002/nur.20441 [PubMed: 21656784]

37. Hart PL, Mareno N. Cultural challenges and barriers through the voices of nurses. *J Clin Nurs*. 2014;23(15–16):2223–2233. doi: 10.1111/jocn.12500 [PubMed: 24373028]
38. Friedberg MW, Van Busum K, Wexler R, Bowen M, Schneider EC. A demonstration of shared decision making in primary care highlights barriers to adoption and potential remedies. *Health Aff*. 2013;32(2):268–275. doi: 10.1377/hlthaff.2012.1084
39. The American Geriatrics Society Expert Panel on Person-Centered Care. Person-centered care: A definition and essential elements. *J Am Geriatr Soc*. 2016;64(1):15–18. doi: 10.1111/jgs.13866 [PubMed: 26626262]
40. Auerbach DI, Chen PG, Friedberg MW, et al. Nurse-managed health centers and patient-centered medical homes could mitigate expected primary care physician shortage. *Health Aff*. 2013;32(11):1933–1941. doi: 10.1377/hlthaff.2013.0596
41. Parand A, Dopson S, Renz A, Vincent C. The role of hospital managers in quality and patient safety: a systematic review. *BMJ Open*. 2014;4(9):e005055. doi: 10.1136/bmjopen-2014-005055
42. Lasater KB, Jarrín OF, Aiken LH, McHugh MD, Sloane DM, Smith HL. A methodology for studying organizational performance: A multistate survey of front-line providers. *Medical Care*. 2019;57(9):742–749. doi: 10.1097/MLR.0000000000001167 [PubMed: 31274782]

### Highlights

- Organizational support offered to NPs varies across practice environments
- Organizational supports are linked to NPs' ability to provide individualized care
- More supportive practice environments may promote patient centered care

**TABLE 1.** Characteristics of NPs and Differences between NPs Who Frequently Integrate Patient Preferences into Care and NPs Who Do Not

| NP Characteristics                   | Total Sample (n=1,783) | NPs Who Frequently Integrate (n=1,354; 75.9%) | NPs Who Do Not Frequently Integrate (n=429; 24.1%) | <i>p</i> |
|--------------------------------------|------------------------|---|--|----------|
| Age, years, mean (SD)                | 49.1 (10.9)            | 49.7 (10.8)                                   | 47.0 (10.9)  | .019     |
| Years RN, mean (SD)                  | 20.5 (12.8)            | 21.0 (12.9)                                   | 18.7 (12.4)  | <.001    |
| Years NP, mean (SD)                  | 13.4 (9.4)             | 13.4 (9.3)                                    | 13.1 (9.5)   | .430     |
| Years in current position, mean (SD) | 8.1 (7.5)              | 8.1 (7.6)                                     | 8.1 (7.0)  | .895     |
| Sex, n (%)                           |                        |   |  | .180     |
| Female                               | 1,636 (91.8)           | 1,238 (75.7)                                  | 398 (24.3)   |          |
| Male                                 | 140 (7.9)              | 113 (80.7)                                    | 27 (19.3)  |          |
| Ethnicity, n (%)                     |                        |   |  | .037     |
| Non-Latino                           | 1,446 (81.1)           | 1,068 (73.9)                                  | 378 (26.1)   |          |
| Latino                               | 106 (6.0)              | 88 (83.0)                                     | 18 (17.0)  |          |
| Race, n (%)                          |                        |   |  | .003     |
| White                                | 1,539 (86.3)           | 1,144 (74.3)                                  | 395 (25.7)   |          |
| Black                                | 75 (4.2)               | 67 (89.3)                                     | 8 (10.7)   |          |
| Asian                                | 765 (4.2)              | 63 (84.0)                                     | 12 (16.0)  |          |
| English first language, n (%)        |                        |   |  | <.001    |
| Yes                                  | 1,619 (90.8)           | 1,211 (74.8)                                  | 408 (25.2)   |          |
| No                                   | 158 (8.9)              | 138 (87.3)                                    | 20 (12.7)  |          |
| Job status, n (%)                    |                        |   |  | .417     |
| Fulltime                             | 1,251 (70.2)           | 955 (76.3)                                    | 293 (23.7)   |          |
| Part time                            | 506 (28.4)             | 377 (74.5)                                    | 129 (25.5)   |          |

Note. Totals may not equal 100% due to missing.

**TABLE 2.**

Practice Characteristics of NPs and Differences between NPs Who Frequently Integrate Patient Preferences into Care and NPs Who Do Not

| Practice Characteristics                         | Total Sample (n=1,783) | NPs Who Frequently Integrate (n=1,354; 75.9%) | NPs Who Do Not Frequently Integrate (n=429; 24.1%) | p     |
|--|------------------------|---|--|-------|
| <b>Number of NPs in your organization, n (%)</b> |                        |   |  | <.001 |
| <5   | 872 (48.9)             | 626 (71.8)                                    | 246 (28.2)   |       |
| 5–20   | 415 (23.3)             | 330 (79.5)                                    | 85 (20.5)  |       |
| >20  | 474 (26.6)             | 382 (80.6)                                    | 92 (19.4)  |       |
| <b>Main practice site, n (%)</b>                 |                        |   |  | <.001 |
| Physician/NP Office                              | 1,180 (66.2)           | 860 (72.9)                                    | 320 (27.1)   |       |
| Community Clinic                                 | 214 (12.0)             | 184 (86.0)                                    | 30 (14.0)  |       |
| Home Health                                      | 71 (4.0)               | 61 (85.9)                                     | 10 (14.1)  |       |
| Hospital-based Ambulatory                        | 104 (5.8)              | 82 (78.8)                                     | 22 (21.2)  |       |
| <b>Practice site location, n (%)</b>             |                        |   |  | .004  |
| Urban  | 1,679 (94.2)           | 1,286 (76.6)                                  | 393 (23.4)   |       |
| nonurban   | 100 (5.6)              | 64 (64.0)                                     | 36 (36.0)  |       |
| <b>Patients seen daily, mean (SD)</b>            | 16.9 (10.4)            | 17.1 (10.8)                                   | 16.4 (8.7)   | .527  |

Note. Totals may not equal 100% due to missing.

**TABLE 3.**

Practice-Level Practice Environment, Overall and for NPs who Do and Do Not Frequently Integrate Patient Preferences into Care

| Practice Environment, n (%) | Total Practices (n=1,571) | NPs Who Frequently Integrate (n=1,372; 76%) | NPs Who Do Not Frequently Integrate (n=433; 24%) | P     |
|-----------------------------|---------------------------|---|--|-------|
| Poor                        | 725 (46.1)                | 607 (71.1)                                  | 247 (28.9)                                       | <.001 |
| Mixed                       | 475 (30.2)                | 410 (77.6)                                  | 118 (22.4)                                       |       |
| Good                        | 371 (23.6)                | 337 (84.0)                                  | 64 (16.0)  |       |



**TABLE 4.**

Odds Ratios Estimating the likelihood of NPs Frequently Integrating Cultural Needs and Preferences

| NP and Practice Characteristics         | Adjusted Model |         |       |
|---|----------------|---------|-------|
|   | Odds Ratio     | 95% CI  | P     |
| <b>Practice Environment<sup>d</sup></b> |                |         |       |
| <b>Mixed</b>                            | 1.4            | 1.0–1.8 | .037  |
| <b>Good</b>                             | 2.3            | 1.6–3.3 | <.001 |

*Note.* Covariates that were significant at the  $p < .20$  level in the bivariate analyses were included in the adjusted logistic model to predict NP integration of patient needs and preferences (NP characteristics included gender, race, ethnicity, English speaking, years as a nurse; practice characteristics included number of NPs in the organization, practice site, urban/rural, and state).

<sup>d</sup>reference category is poor practice environments