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Abstract

Rural primary care shortages may be alleviated if more nurse practitioners (NPs) practiced there. This study compares urban and rural primary care NPs (classified by practice location in urban, large rural, small rural, or isolated small rural areas) using descriptive analysis of the 2012 National Sample Survey of NPs. A higher share of rural NPs worked in states without physician oversight requirements, had a DEA (drug enforcement administration) number, hospital admitting privileges, and billed using their own provider identifier. Rural NPs more often reported they were fully using their NP skills, practicing to the fullest extent of the legal scope of practice, satisfied with their work, and planning to stay in their jobs. We found lower per capita NP supply in rural areas, but the proportion in primary care increased with rurality. To meet rural primary care needs, states should support rural NP practice, in concert with support for rural physician practice.

Keywords

primary care, rural health care, scope of practice, nurse practitioners, nurses

Introduction

Rural communities have long faced health professional shortages, and an aging population and implementation of the Affordable Care Act have heightened concern about

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a lack of primary care physicians (Bodenheimer & Pham, 2010; Colwill, Cultice, & Kruse, 2008; Huang & Finegold, 2013; Ku, Jones, Shin, Bruen, & Hayes, 2011; Nicholson, 2009; Petterson et al., 2012; Sargen, Hooker, & Cooper, 2011). Many health policy experts have proposed that nurse practitioners (NPs) and physician assistants (PAs) can play an important role in addressing primary care shortages (Auerbach et al., 2013; Fairman, Rowe, Hassmiller, & Shalala, 2011; Hooker, Brock, & Cook, 2016; Institute of Medicine, 2011; Naylor & Kurtzman, 2010). It has been estimated that up to 75% of rural primary care services could be provided by NPs and PAs (Doescher, Andrilla, Skillman, Morgan, & Kaplan, 2014; Sullivan-Marx, 2008). NPs and PAs are proportionately more likely to work in rural communities than are physicians (Grumbach, Hart, Mertz, Coffman, & Palazzo, 2003; Hooker, Benitez, Coplan, & Dehn, 2013; Hooker & Berlin, 2002) and, in many rural communities, an NP or PA serves as the only primary care provider (National Advisory Committee on Rural Health & Human Services, 2010). In addition, prior research has found that NPs and PAs are more likely than physicians to serve as providers of care for patients enrolled in Medicaid or paying for care out-of-pocket, particularly in rural areas (Benitez, Coplan, Dehn, & Hooker, 2015; Skillman, Fordyce, Yen, & Mounts, 2012).

NPs comprise the largest group of nonphysician primary care providers in the United States (19%), with more than 50,000 providing primary care services (Agency for Healthcare Research & Quality, 2012), and in rural areas, they provide much needed care, especially for underserved populations. But there has been little research on the work patterns or job satisfaction of NPs employed in rural areas. This article compares the characteristics of NPs who provide primary care in rural versus urban areas (including employment, practice, and satisfaction) in order to examine differences in NP practice that can be used to assess the factors that may maintain NP supply in rural regions.

New Contributions

Although the potential for NPs and PAs to mitigate rural primary care shortages is widely acknowledged, there have been few analyses of the practice patterns, autonomy, and job satisfaction of rural NPs. Moreover, there has been no research on differences between NPs practicing in large rural, small rural, and isolated small rural areas. This analysis of nationally representative survey data is the first to examine the practice and satisfaction of rural NPs across types of rural areas and in comparison with NPs in urban areas. Our findings reveal differences for primary care NPs across the range of rural settings and illustrate how NPs can help alleviate shortages of rural primary care providers.

Method

We analyzed data from the U.S. Health Resources & Services Administration's (HRSA's) 2012 National Sample Survey of Nurse Practitioners, which surveyed nearly 22,000 randomly selected licensed NPs from all U.S. states and Washington, D.C. The survey was fielded on paper, with an option to respond through a website. The survey

Table 1. NP Supply in Urban and Rural Areas, 2012.

	Urban areas	Rural areas (overall)	Subrural areas		
			Large rural areas	Small rural areas	Isolated small rural areas
Currently licensed NPs (unweighted)	10,955	1,882	1,066	489	327
Currently licensed NPs (weighted)	131,095	21,954	12,463	5,680	3,811
NPs per 100,000 population	51.8	38.0	42.1	35.7	31.4
Number working in primary care NP position	47,118	13,028	6,807	3,600	2,621
Percentage working in primary care NP position	35.9	59.3	54.6	63.4	68.8

Note. NP = nurse practitioner.

Source. Authors' analysis.

yielded nearly 13,000 responses, with a response rate of 60%, and responses were weighted to produce unbiased national estimates (U.S. HRSA, 2014). Survey questions addressed NPs' demographics, licensure, education (both RN and NP), clinical practice setting, job title, field of clinical specialty, physician supervision and collaboration, and satisfaction with multiple aspects of their practice and profession.

We accessed a restricted-use version of the data set for this analysis, which included NPs' residence and practice ZIP codes. We assigned NPs to urban, large rural, small rural, and isolated small rural areas based on location of practice (or residence, if practice was not available) using the ZIP code Version 3.1 of the Rural–Urban Commuting Area (RUCA) codes (Morrill, Cromartie, & Hart, 1999; University of North Dakota, 2014). The RUCAs are a rural–urban classification based on population density and population work commuting patterns.¹

Primary care NPs were those providing direct patient care who reported that the specialty of the practice/facility at their main NP position was internal medicine, family practice, geriatrics, general pediatrics, adolescent medicine, obstetrics and gynecology, women's health, school health, or a combination of these specialties. These specialties account for approximately 48% of employed NPs (Spetz, Fraher, Li, & Bates, 2014).

Descriptive analyses used the weights provided. Rao–Scott chi-squared tests and *t* tests identified significant differences. All analyses used SAS statistical software version 9.4.

Results

NPs were concentrated in urban areas (Table 1), with 51.8 NPs per 100,000 population in urban areas and 38 per 100,000 in rural areas. The per capita concentration of NPs declined with rurality, while the proportion of NPs employed in primary care increased.

Table 2. Practice Settings and Hours Worked per Week by NPs Employed in Primary Care, by Urban/Rural Setting, 2012.

	Urban areas	Large rural areas	Small rural areas	Isolated small rural areas	<i>p</i> ^a
Works in more than one practice location	24.7%	25.5%	21.7%	27.8%	.359
Mean hours per week (all positions)	38.8	39.9	40.2	40.8	.013
Takes evening or weekend call	35.4%	34.9%	31.6%	34.7%	.643
Time in management/supervision	7.0%	6.1%	6.5%	7.7%	.124
Has own panel of patients	55.6%	68.0%	66.4%	79.2%	<.0001
Mean patients seen weekly	66.1	70.7	76.7	71.3	<.0001
Mean patients in panel (for those with a panel)	597.4	813.5	807.1	902.5	.0002
Has hospital admitting privileges	14.0%	16.4%	21.3%	25.3%	<.0001
Has DEA number	74.2%	81.2%	79.2%	85.2%	<.0001

Note. NP = nurse practitioner; DEA = drug enforcement administration. For categorical variables, an overall chi-square test was used and an *F* statistic was used for the variables in which a mean value is reported.

^a*p* Values compare variables across the four geographies.

Source. Authors' analysis.

Within urban areas, only 35.9% of NPs were working in a primary care position, compared with 59.3% in all rural areas and 68.8% in isolated small rural areas.

There were many similarities in the demographic characteristics of rural and urban primary care NPs. They were similar in age (average 48.4 vs. 49.2 years, *ns*) and gender (6.4% men, for rural vs. 5.5%, for urban, *ns*). Rural NPs were less racially/ethnically diverse (4.6% non-White among rural vs. 14.4% among urban, $p < .001$). The vast majority of both rural (79.3%) and urban (80.9%) primary care NPs entered the profession via a master's degree program.

Among NPs employed in primary care, there were some similarities across urban and rural areas in their workloads, and some notable differences, as presented in Table 2. Rural NPs worked slightly more hours on average, particularly those in isolated small rural areas ($p = .013$). More than two thirds of rural NPs and nearly 80% in isolated small rural areas had their own patient panels, compared with 55.6% of urban NPs ($p < .001$). Rural NPs saw more patients weekly, on average ($p < .001$) and, for those with their own panel, reported notably larger panel sizes ($p < .001$). It is thus not surprising that primary care NPs in rural areas—especially those in isolated small rural areas—were also more likely to have a DEA number ($p < .001$) and hospital admitting privileges ($p < .001$).

There also were notable rural–urban differences in payment methods. Table 3 shows rural primary care NPs were more likely to bill for services using their own National Provider Identification number ($p < .001$), more likely to be paid an annual salary ($p = .002$), and less likely to be paid hourly ($p < .001$) than urban NPs. There was no significant difference in NP annual earnings across urban and

Table 3. Salaries and Payment Methods of NPs Working in Primary Care, by Urban/Rural Practice Setting, 2012.

	Urban areas	Large rural areas	Small rural areas	Isolated small rural areas	<i>p</i>
Billing using own NPI number	38.5%	50.7%	54.4%	48.8%	<.0001
Paid by annual salary	57.6%	62.9%	66.3%	60.3%	.002
Paid by the hour	35.2%	26.6%	23.8%	30.1%	<.001
Paid a percentage of billing	5.2%	6.9%	5.4%	7.9%	.177
Average total annual earnings ^a	\$84,988	\$83,323	\$85,512	\$86,365	.525
Satisfied or very satisfied with salary and benefits	71.5%	69.0%	73.5%	75.0%	.364

Note. NP = nurse practitioner; NPI = National Provider Identification.

^a27 NPs (307.7 weighted) were excluded because their annual reported incomes of \geq \$1 million were determined to be outliers. All of these observations were more than 12 standard deviations from the overall unweighted mean.

Source. Authors' analysis.

rural practice settings ($p = .525$) or the share satisfied or very satisfied with their earnings ($p = .364$).

As shown in Figure 1, high percentages of both urban and rural NPs were satisfied or very satisfied with their principal position overall, and NPs in isolated small rural areas were significantly more satisfied than other rural NPs ($p = .009$). Rural NPs were more likely to report they are satisfied with their patient load than urban NPs, even though they had a greater workload.

Rural NPs were more likely than urban NPs to be in states without supervision requirements, particularly NPs practicing in isolated small rural areas. Compared with urban NPs, rural NPs more often agreed or strongly agreed that their skills are fully used ($p = .041$) and that they practice to the full extent of their state's legal scope of practice ($p = .012$). The highest shares agreeing with these statements practiced in isolated small rural areas. NPs in isolated small rural areas were also more satisfied with input into organizational policies than were other NPs ($p = .002$; not shown). Finally, rural NPs—particularly in isolated small rural areas—were significantly less likely to plan to leave their position within 1 to 2 years. They were also significantly less likely to plan to leave their position than other rural NPs ($p = .022$). The shares planning to retire within the next 2 years were similar across area types (not shown).

Conclusions

While rural and urban NPs practicing primary care were similar in many ways, rural NPs worked more hours and reported characteristics indicating greater practice autonomy, especially among NPs working in isolated small rural areas. These findings are

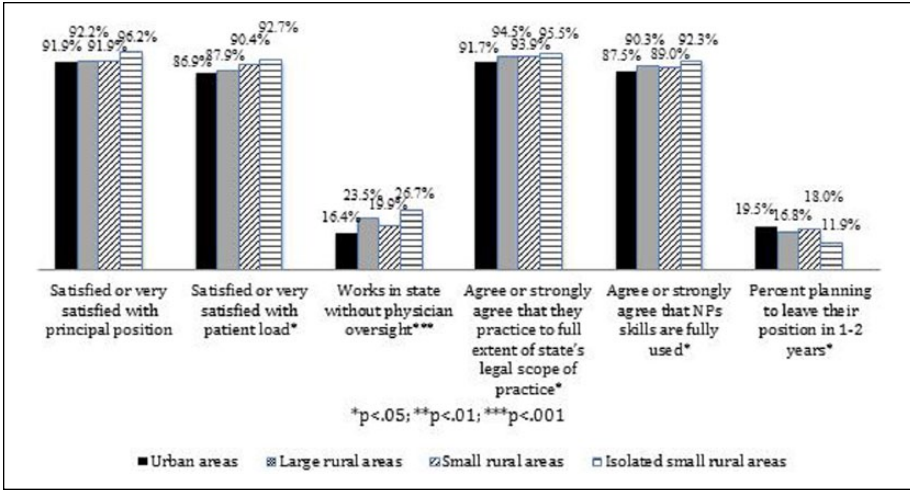


Figure 1. Job satisfaction, physician oversight, utilization of skills, and intentions to quit for NPs working in primary care, by urban/rural practice setting, 2012.

Note. NP = nurse practitioner. Satisfaction with principal position was significantly different for isolated small rural areas as compared with other areas.

Source. Authors' analysis.

consistent with prior research that reports that rural NPs have higher patient volumes and are more likely to be the principal care provider for patients than are NPs in urban areas (Martin, 2000).

It has been argued that regulations requiring NPs to practice in collaboration with or under supervision of a physician negatively affect NPs' ability to meet patient care needs, including in rural areas (Ewing & Hinkley, 2013; Van Vleet & Paradise, 2015). In 22 states and Washington, D.C., NPs can provide care and prescribe medication without physician collaboration or supervision (American Association of Nurse Practitioners, 2015). Prior research found greater growth between 1998 and 2010 in the number of Medicare patients receiving services billed by NPs among states with the least restrictive scope of practice regulations (Kuo, Loresto, Rounds, & Goodwin, 2013). A study that specifically examined the relationship between scope of practice regulations and likelihood of NPs being in rural locations found a similar, but statistically insignificant, relationship (Kaplan, Skillman, Fordyce, McMenamin, & Doescher, 2012). It is possible that requirements for physician collaboration or supervision inhibit NPs' ability to practice in rural areas (where physician shortages are common) and, when NPs can practice, they are more likely to provide primary care, work more hours, and see more patients than urban NPs. Future research should explore whether this finding applies in both rural and urban areas, and whether specific components of scope of practice regulations are more important in allowing NPs to practice effectively in rural areas.

Regulations are only one factor that may influence NPs' practice in rural areas and their satisfaction with practice. Work environments that encourage professional

collaboration and positive work–life balance, autonomy, and respectful management are known to improve retention (Lindeke, Jukkala, & Tanner, 2005; Misfeldt et al., 2014; Poghosyan, Liu, Shang, & D’Aunno, 2015). More NPs might consider rural practice if the positive characteristics, including greater practice autonomy and comparable salaries, were used as recruiting tools (Keith, Coburn, & Mahoney, 1998). These same factors might also apply to PAs’ decisions about rural employment, and future research should assess whether they report similar practice autonomy and satisfaction.

Our findings indicate that NPs offer substantial potential to help alleviate shortages of rural primary care, particularly in isolated rural areas. NPs who work in these regions are highly engaged in delivering primary care, are very satisfied with their work, and are less likely to plan to leave their position than are urban NPs. States should encourage NPs to help meet rural primary care needs, in concert with continuing policies to support rural physician and PA practice.

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Authors’ Note

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Note

1. The RUCA codes assigned to each category were the following: Urban = 1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1; Large Rural = 4.0, 4.2, 5.0, 5.2, 6.0, and 6.1; Small Rural = 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, and 9.2; Isolated Small Rural = 10.0, 10.2, 10.3, 10.4, 10.5, and 10.6. Any NP practice ZIP locations that did not link to the RUCA codes were attributed to RUCA codes by comparing the practice city, U.S. Postal Service city-ZIP lookup, and the RUCA codes associated with the city ZIP codes.

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