

ABSTRACT

Objectives: Dermatology is not heavily covered in the curricula of physician assistant (PA) programs or on the certification examination, even though patient visits to PAs for skin complaints are very common. If significant on-the-job training is thus required for dermatology care, then practice setting differences likely impact the quality of that informal training. This study sought to identify differences in the ability of rural and urban PAs to diagnose skin disorders.

Methods: An Internet-based survey of rural and urban primary care PAs ($n = 295$) was conducted. The survey collected demographic information and provided case scenarios with questions related to diagnosis of a skin disease or complication.

Results: Average quiz score was higher for rural PAs than for urban PAs (61.6% versus 55.4%, $P = .024$). Rural PAs more commonly treated the majority of their patients seen for skin complaints. Rural PAs reported a greater comfort level in diagnosing and treating skin disease than did urban PAs (91% versus 80%, $P < .05$). Both groups referred a comparable percentage of patients to skin specialists. Regression analysis identified several factors that accounted for the ability to predict success scores for both the rural ($P < .05$) and urban ($P < .05$) groups.

Conclusions: The stronger overall ability of rural PAs to diagnose a variety of skin diseases is likely impacted by the higher number of dermatologic cases they see. PA educators should re-evaluate the curricula devoted to skin conditions and consider elective opportunities for students with an interest in a dermatology career.

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Dermatology diagnoses among rural and urban physician assistants

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OBJECTIVES

Dermatology is not well-covered in the curricula of physician assistant (PA) programs across the nation, when compared to topics like cardiology or pulmonology.¹ Nor is it emphasized on the certification or recertification examinations: dermatologic conditions make up approximately 5% of the content of National Commission on Certification for Physician Assistants (NCCPA) exams, placing the skin among the three least commonly tested organ systems.² These are interesting findings that warrant further study, given that dermatologic conditions are common reasons for patients to visit a PA.

In a 2008 survey conducted by the American Academy of Physician Assistants (AAPA), a convenience sample of about 2,200 PAs was asked to estimate the number of visits made to them in a typical week by patients for each of 28 common disorders, conditions, and services.³ Dermatitis and skin conditions were ranked as the seventh most common reason for patient visits.³ Satyaprakash and colleagues reported that primary care PAs are often responsible for diagnosis and treatment of dermatologic conditions.⁴ Clark and colleagues identified skin complaints as the third most common reason for visits to a PA.⁵

Discussions about the quality of dermatology training that PAs receive has also been fueled by a steady increase in the number of jobs for PAs in dermatology practices.⁶ Clark and colleagues reported that for PAs in this specialty, "the bulk of dermatology training ... is received on the job from their dermatologist employer..."⁵ This finding may indicate poor coverage of dermatology in PA training programs, especially for graduates who want to practice in dermatology. If Clark's assertion about on the job training is correct, the quality of this experiential training is likely to depend on multiple variables, such as the frequency with which dermatology cases present to a practice and the availability of a supervising physician or a dermatologist for consultation and feedback.

In most urban areas, PAs can easily refer their patients to a dermatologist when necessary. In many rural settings, however, the limited availability of dermatologists can make referral difficult. Rural patients are also more commonly uninsured, which also creates barriers to care.⁷ Thus, rural providers often must manage conditions themselves that they might prefer to send to a specialist if referral was possible. This situation raises the question of how well rural PAs perform in the care of skin disorders. This study sought to identify whether differences exist in the ability to diagnose dermatologic disorders among PAs practicing in rural versus urban settings and to determine whether these PAs felt that their clinical training in dermatology was adequate.

METHODS

A Web-based survey was conducted from August to November 2008 using SurveyMonkey.com. Invitations were distributed electronically to primary care PAs in all 50 states using state association lists. *Primary care PAs* were defined according to AAPA 2008 census data as those practicing in family/general medicine, general internal medicine, general pediatrics, and obstetrics/gynecology.⁸ According to AAPA estimates, approximately 37% of PAs were practicing in these fields, out of a total of 79,980 persons eligible to practice as a PA.⁸ The survey went to 600 PAs, and 295 responded. Not all survey respondents successfully completed the entire survey.

The survey recipients were asked to describe their primary clinical setting by the type of practice and whether it was located in a rural or urban setting. Demographic information collected included gender, age, and the number of years engaged in clinical practice as a PA. Recipients additionally were asked to estimate the average number of patients with skin disease that they evaluated per week, the percentage of patients with a skin disease that they independently diagnosed per week, and the percentage of patients on average that they referred to dermatology per week. Respondents were also asked to rank their comfort level with diagnosis and treatment of skin diseases and to comment on the relative amount of dermatology training offered during their PA educational program.

In order to assess knowledge of the diagnosis of skin disease, the survey included 10 patient case scenarios with a question asking the recipient to identify a specific skin disease or complication. Each case scenario consisted of a brief synopsis of the patient's chief complaint, history of present illness, medical history, and a photograph of the skin lesion in question. The skin disorders presented in the case scenarios represented conditions or related complications listed in the NCCPA blueprint. The case scenarios and photographs were peer reviewed by a panel of three physician assistants, each of whom possessed more than 5 years of experience in clinical practice and PA education. The panel included PAs from three different practice settings: dermatology, family medicine, and emergency medicine. The criteria used to evaluate the case scenarios included quality of the photograph, degree to which the specific condition can be diagnosed visually without additional testing, and consistency of historical information with a characteristic presentation of the disorder. Only cases in which each of the three PAs identified both the case scenario and photograph as *satisfactorily meets all criteria* were selected for the survey. Correct and incorrect answers were compared and analyzed for any significant differences in the ability of PAs to diagnose these dermatologic conditions accurately.

Statistical analysis All analyses and graphs were performed using Sigma Stat 3.5, Sigma Plot 10.0, and SPSS 15.0. Simple descriptive statistics such as frequency and percentage were calculated for all categorical variables. Mean, median, standard deviation, minimum, and maximum were calculated for all continuous variables. The Kolmogorov-Smirnov normality distribution test was performed for all variables. The variable "test scores" did not have a normal distribution in

TABLE 1. Average percent of correct answers on the survey quiz

Group	N	Missing	Median (%)	Mean (%)
Rural PAs	132	0	60	61.6
Urban PAs	132	0	60	55.4
Mann-Whitney U statistics = 7332.000				
T = 18870.000; n (small) = 132, n (big) = 132				
P = .024				

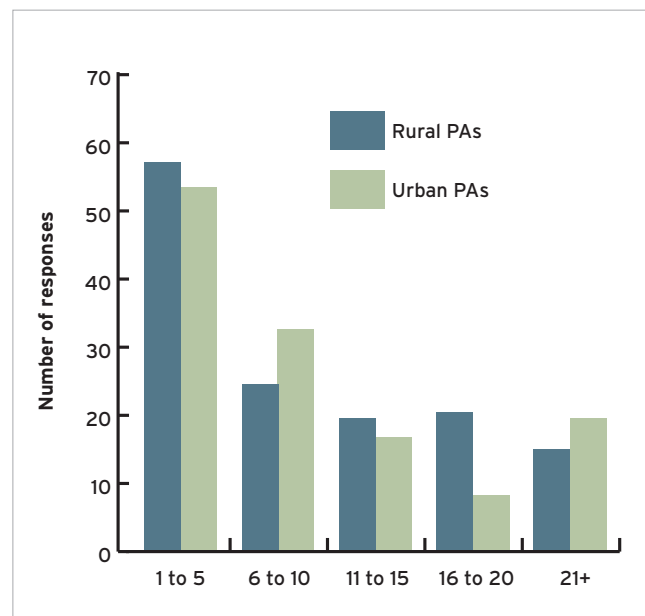


FIGURE 1. Years of experience

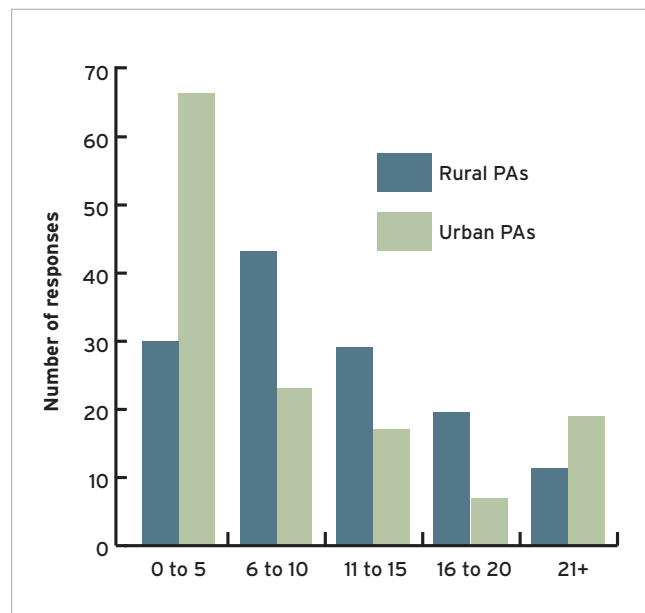


FIGURE 2. Average number of cases per week

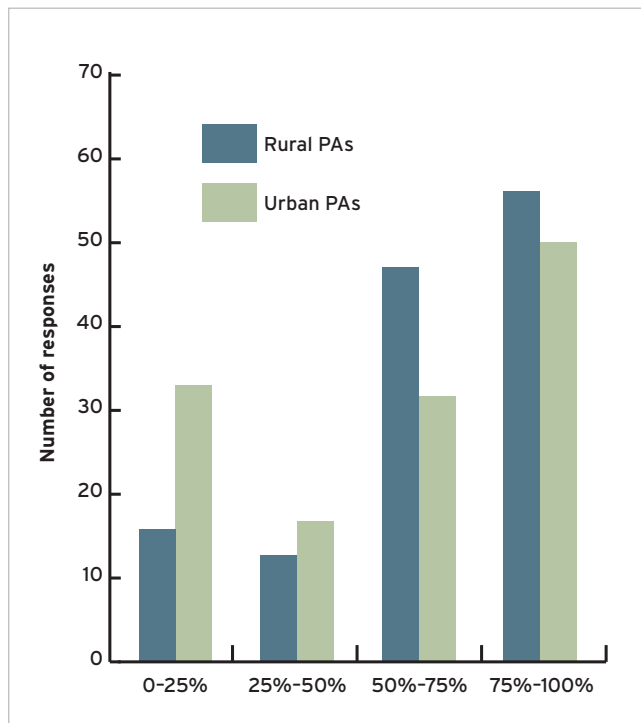


FIGURE 3. Average number of cases diagnosed and treated per week

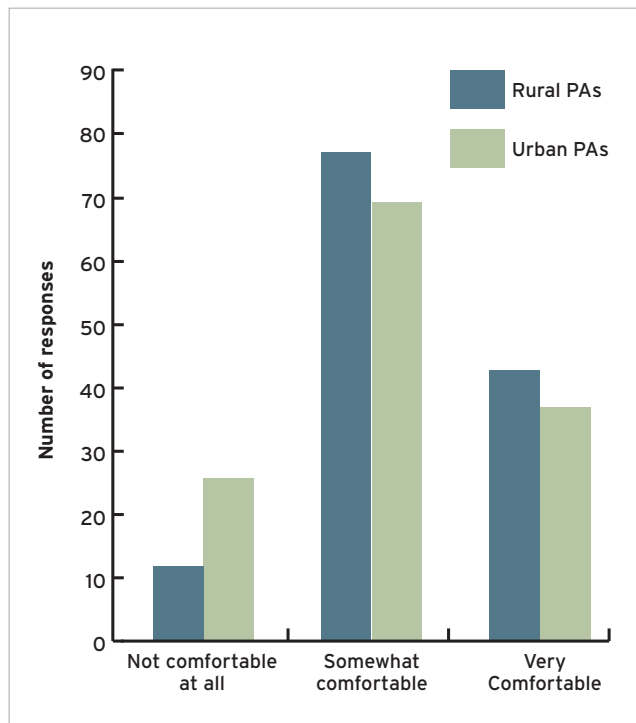


FIGURE 4. Level of comfort with diagnosis and treatment of dermatologic conditions

which many respondents' scores clustered around the mean, and there were too many outliers. Based on statistical principles, instead of using an independent t-test to compare the average scores, the authors used a Mann-Whitney rank sum test to compare the median scores on case study question results between two groups of PAs, those self-identified as primarily practicing in a rural versus urban setting. The desired sample size was set, and the first 132 survey submissions for each group was stored and analyzed. Comparisons of categorical variables between the two groups were performed using the chi-square test with the Yates continuity correction. Spearman rank correlation was used to determine association between various variables and scores on the 10 cases in the survey. In addition, a multiple linear regression model was completed with test scores as the dependent variable, and variables like rural/urban, perception of training, age, gender, and years of experience served as predictor variables. All statistical tests were analyzed for both groups (rural vs. urban). A value of $P < .05$ was considered to represent a statistically significant difference for all tests.

“As expected, clinical exposure to dermatologic conditions is correlated with the physician assistant’s diagnostic ability.”

RESULTS

The respondents analyzed ($n = 264$) included 132 who were self-reported as rural PAs and 132 who were self-reported as urban PAs. All analyzed surveys came from respondents who successfully completed the entire survey instrument. The average score for the 10-question case scenario quiz was 61.6% (median score 60.0%) for rural PAs and 55.4% (median score 60.0%) for urban PAs. The difference in quiz scores between rural and urban PAs was statistically significant ($P = .024$) (Table 1).

Based on the surveys analyzed ($n=264$), male PAs represented 17% of the respondents from rural areas and 15% of those from urban areas. The average ages of survey respondents were similar in both groups, and no statistical differences were found. For the study population, 27% were 21 to 30 years, 30% were 31 to 40 years, 22% were 41 to 50 years, 17% were 51 to 60 years, and 4% were 61 years or older. The following comparisons are also reported: experience in years (Figure 1), average number of dermatologic cases seen per week (Figure 2), average number of dermatologic cases the PA feels able to independently diagnose and treat per week (Figure 3), comfort level in diagnosing and treating dermatologic conditions (Figure 4), percentage of dermatologic cases referred by the PA to a specialist per week (Figure 5), and opinion on amount of dermatology education provided in the respondent’s PA training program (Figure 6).

There was no correlation between perception of training in dermatology and scores on the 10 cases from the survey in

either the rural or the urban group. There were good correlations between scores and the following variables in both the rural and urban groups, respectively): average number of dermatologic cases seen per week ($r = 0.618$, $P < .001$; $r = 0.633$, $P < .001$); average number of dermatologic cases the PA feels able to independently diagnose and treat per week ($r = 0.626$, $P < .001$; $r = 0.696$, $P < .001$); and comfort level in diagnosing and treating dermatologic conditions ($r = 0.585$, $P < .001$; $r = 0.621$, $P < .001$). With a regression analysis, the variables gender, average number of dermatologic cases seen per week, and average number of dermatologic cases the PA feels able to independently diagnose and treat per week appeared to account for the ability to predict success scores ($P < .05$) for the rural group. For the urban group, variables like gender, average number of dermatologic cases the PA feels able to independently diagnose and treat per week, and comfort level in diagnosing and treating dermatologic conditions were good predictors for success scores ($P < .05$).

DISCUSSION

The survey results reveal that a large majority of the respondents (42%) possess 5 years or less of clinical experience, indicating a large cohort of recent graduates. The survey pool did include more experienced PAs, however, with 22% reporting 6 to 10 years of experience and 35% reporting 11 or more years of experience.

More rural PAs (78%) than urban PAs (62%) reported diagnosing and treating 50% to 100% of patients seen for skin complaints, which represents a statistically significant finding ($P < .01$). Rural PAs also reported a greater comfort level in diagnosing and treating skin disease; 91% of rural PAs versus 80% of urban PAs say they are “somewhat comfortable” to “very comfortable,” which represents a statistically significant finding ($P < .05$). Good correlations were also seen between comfort level in diagnosing and treating dermatologic conditions and the type of practice setting (rural or urban). Despite differences in comfort level and percentage of patients diagnosed and treated for skin disease, both groups reported nearly the same percentage of patients referred to a skin specialist per week, which generally represented less than one-fourth of all visits for skin complaints. And as expected, a greater exposure to dermatologic conditions, which could be reproduced in a training program, is correlated with higher performance in diagnostic abilities. Finally, whether the PAs practiced in urban or rural areas, their perception of training in dermatology did not have any connection to their knowledge and diagnostic skills with dermatology cases.

LIMITATIONS

Several limitations exist within the survey instrument and population studied. For the survey instrument, respondents were asked to self-identify their primary practice location as rural or urban, and no additional steps were taken to validate respondent self-reports. Respondents were asked to estimate several study variables, including average number

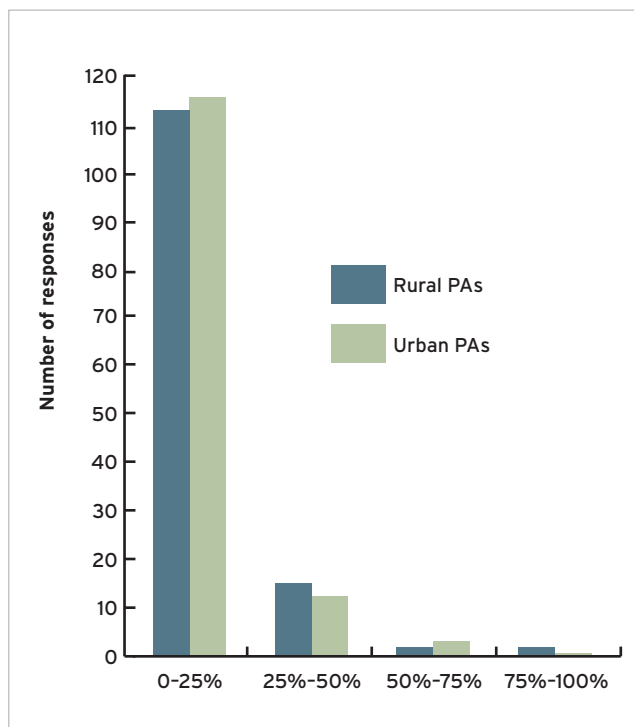


FIGURE 5. Percentage of cases referred per week

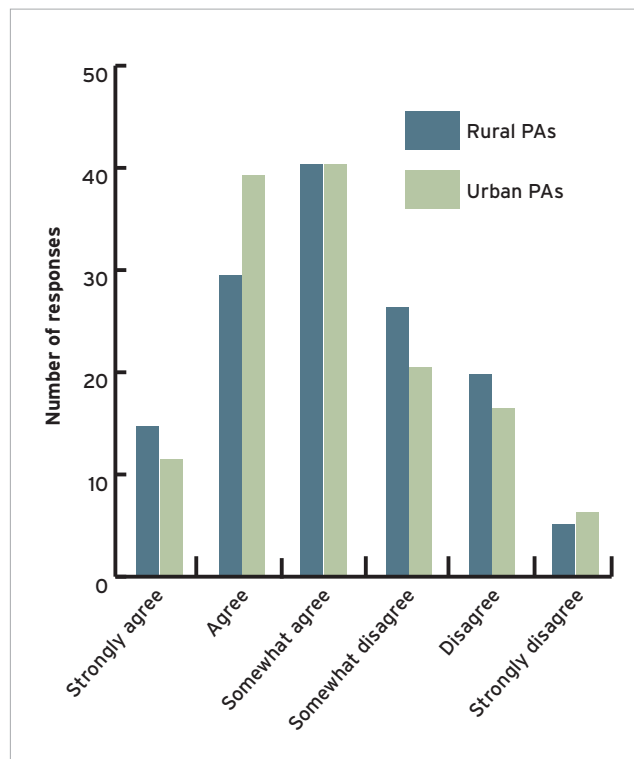


FIGURE 6. Response to the statement on the survey: "My graduate PA program offered an adequate amount of dermatologic education."

of patients seen for skin complaints, percentage of patients with skin conditions the PA was able to diagnose and treat independently, and percentage of patients referred to a skin specialist. Choice of a Web-based survey tool may have contributed to the relatively higher percentage of respondents who reported 5 years or less of experience, consistent with prior research identifying age bias in responses to Internet-based surveys.^{9,10} Characteristics of the respondents' computers, such as display quality or screen size, may have influenced the quality of images used in the case scenarios. Additionally, the case scenarios and questions represent, at best, only a small sampling of the many conditions that PAs encounter in practice. A larger series of case

“The frequency of patient visits to PAs for dermatologic conditions suggests that PAs may need better training in dermatology.”

scenarios would likely enhance the external validity of results, but the researchers were concerned about the effects that an overly long survey would have on the quantity of responses. Finally, the sample was not large enough to allow for adequate subgroup analyses by type of primary care discipline.

CONCLUSION

The results of this survey suggest that rural PAs have developed stronger overall diagnostic ability for the identification of a variety of skin diseases. The results presented in **Table 1** support the assertion that PAs practicing in rural areas diagnose and treat a higher frequency of dermatologic cases than their urban counterparts.

It is likely that rural patients more often see a primary care provider for skin complaints, allowing rural PAs to increase their experience with dermatologic conditions. Additional differences in diagnostic abilities between rural and urban PAs may be explained by patient population characteristics, access to continuing education, availability of a dermatologist for consultation, and level of physician supervision.

Fewer specialty practices are located in rural areas compared to urban areas; and, according to Donald Kollisch of the Rural Health Scholars Program at Dartmouth College, the ratio of patients to providers in rural areas is about twice as high as in urban areas.¹¹ Thus, rural providers end up working longer hours to perform a greater variety of health services and are less able to refer difficult cases to specialists.

Interestingly, rural and urban PAs in our survey reported a comparable percentage of referrals to skin specialists. Prior reports have demonstrated that rural patients are less likely than urban patients to pursue referrals, and this would be a topic worthy of further study. *U.S. News and World Report* recently reported that 1 out of 5 patients ignores a referral.¹² Barriers that likely contribute to failure to pursue a referral may include lack of education, lower socioeconomic status, lack of health insurance, poor understanding of the rationale for referral, fear of a serious diagnosis, failure to complete preauthorization procedures, and transportation issues. These barriers are likely more common among rural than urban patient populations.

As PAs are engaged in treating an aging population and our awareness of environmental and workplace exposures that promote skin disease increases, it seems appropriate that PA educational programs re-evaluate the quantity and quality of instruction and supervised clinical training offered to students in dermatology. The frequency of patient visits to PAs for dermatologic conditions and the increase in market demand for PAs in dermatology practices would seem to support greater educational attention to this organ system. Alternatively, programs could consider offering elective experiences in dermatology settings to students with interest. A greater availability of postgraduate educational activities focused on the successful diagnosis and management of skin disease could also enable PAs to better serve their communities in both rural and urban areas. **JAAPA**

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