2026, Volume 58, Issue 10, 799-803, e-ISSN 1938-3800

Family Medicine

BRIEF REPORT

Association Between Rural Attitudes in Family Medicine Residency and Rural Employment

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HOW TO CITE: Hodge B, Power JM, DeHart G, et al. Association Between Rural Attitudes in Family Medicine Residency and Rural Employment. *Fam Med.* 2026;58(10):799-803. doi: 10.22454/FamMed.2026.0137

FIRST PUBLISHED: November 5, 2026

KEYWORDS: factors, family medicine, rural attitudes, rural employment

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ABSTRACT

Background and Objectives: Rural physician shortages remain a workforce challenge. Residency is a pivotal period for shaping rural attitudes, yet little is known about how attitudes complement postgraduation employment. Our study objective was to understand how rural attitudes at residency completion are associated with rural employment after graduation.

Methods: This cross-sectional study was conducted from 2021 to 2025. All postgraduate year-3 (PGY-3) family medicine residents (N = 85) from two Mountain Area Health Education Center programs in Western North Carolina were invited to complete the validated Student Attitudes to Rural Practice and Life Questionnaire (18 items, four factors). Fifty-three residents responded (62%) and analysis included 48 complete surveys. Employment location was verified through self-report and online searches. Independent t tests, one-way multivariate analyses of variance, and follow-up univariate analyses of variance compared rural attitude scores and factor scores by rural versus nonrural employment.

Results: Participants with rural initial employment had significantly higher overall rural attitude scores (Mean D=−6.65, SE D = 2.70, P = 0.018) and scored higher in friendliness/support (P = 0.007) and work opportunities (P = 0.005). We observed similar findings for rural current employment (Mean D=−6.82, SE D = 2.66, P = 0.014), including higher friendliness/support (P = 0.006) and work opportunities (P = 0.006). We found no differences in the isolation/socialization or enjoyable aspects of rural life factors.

Conclusions: Higher rural attitude scores at training completion were associated with increased likelihood of rural employment. Rural attitude questionnaires may help residency programs evaluate rural curriculum and shape attitudes to favor rural practice choice.

INTRODUCTION

The shortage of physicians in rural areas leads to worse health outcomes across multiple health indices. A variable associated with the supply of physicians to rural areas is the location of residency training, with rural training sites retaining more graduates in rural areas.[1,2] Less is known about how the attitudes of residents during their training affect decisions about future rural practice. Research has demonstrated that individual characteristics, including background, medical school experiences, residency training, and financial/social considerations, interact to influence whether a physician ultimately chooses rural practice.[3]

Fifty-six percent of family medicine graduates practice within 100 miles of their residency program; research supports rural curricula, rotations, mentorship, and community immersion as all contributing to eventual placement.[4,5] Rural training programs (RTPs) have demonstrated the strongest workforce

impact, with long-term rural placement rates two to three times higher than nonrural programs.[6] Despite these successes, the number of RTP graduates remains insufficient to meet national rural workforce needs. Further evaluation of the factors that influence eventual rural employment could help shape curricular changes, improving outcomes of our training programs.

This exploratory study sought to understand how resident attitudes, shaped by curricular content, training setting, and rural clinical rotation during residency, may influence rural employment. While educators emphasize knowledge, skills, and attitudes in medical training, little exists in the literature studying resident attitudes and its influence on future workforce. Specifically, this study explored how family medicine resident attitudes—the factors of friendliness, enjoyability of rural life, isolation, and work opportunities unique to rural practice—are most affected by rural exposure. We hypothesized that more favorable rural attitudes would be associated with greater likelihood of rural employment after residency.

METHODS

This study was a retrospective cohort study using cross-sectional survey design to examine associations between rural attitudes and employment location among family medicine residents. Data were derived from responses to the validated Student Attitudes to Rural Practice and Life (SARPL) questionnaire administered electronically to postgraduate year-3 (PGY-3) family medicine residents in two Mountain Area Health Education Center (MAHEC) programs between 2021 and 2025, along with employment information collected postgraduation.[7] MAHEC is a nonprofit organization established in 1974 to improve the training, retention, and quality of health care professionals in Western North Carolina, with a particular focus on rural and underserved communities. Based in Asheville, North Carolina, MAHEC serves a 16-county area in which many surrounding counties are predominantly rural and integrates clinical care, graduate medical education, and health professions training to strengthen the regional health care workforce. Our primary objective was to examine associations between rural attitude scores and subsequent employment location.

This secondary analysis was exempt from ethical approval by the Institutional Review Board at UNC Health Pardee (IRB# 5525–36), because all data were de-identified so identities of human subjects could not be directly ascertained through identifiers linked to the subjects.

We gathered employment data through a combination of methods, including self-reporting and systematic online and phone inquiries. Employment location is collected immediately after graduation and updated annually thereafter. We used the Rural Health Grants Eligibility Analyzer, created by the Health Resources and Services Administration (HRSA), to determine rurality.[8] This approach incorporated multiple geographic criteria, including nonmetropolitan counties, select census tracts within metropolitan counties based on Rural-Urban Commuting Area codes, population density, and measures of geographic isolation (eg, road ruggedness). Using this method allowed rural classification at both the county and subcounty (census tract) levels, capturing the heterogeneity of rurality across the region. Accordingly, sites classified as rural could include a range of contexts from micropolitan communities to more geographically isolated rural areas.

We calculated the rural attitude score from the 18 items on the SARPL questionnaire (Table 1).[7] Response options ranged from 1 (strongly disagree) to 6 (strongly agree) for each item; higher responses generally indicated more favorable rural attitudes. Five items were reverse-worded such that higher responses indicated less favorable rural attitudes and were reverse-coded. Four factors have been identified within the SARPL (Table 1).[7] Higher factor scores indicated more favorable rural attitudes within each factor, with the exception of the isolation and socialization factor, which contained all the original survey's reverse-worded questions. Therefore, lower scores on this factor indicated more favorable rural attitudes. To our knowledge, no SARPL analysis examining rural attitude scores has been used in other family medicine residencies, and this is a novel approach in the utilization of this tool.

We used independent samples *t* tests to compare rural attitude scores between participants who had rural versus nonrural initial and current employment. We used one-way multivariate analyses of variance (MANOVA) to determine whether rural and nonrural groups differed across all rural attitude factor scores for initial and current employment. Missing data were excluded listwise. Analyses were conducted in SPSS Statistics version 29 (IBM).

RESULTS

Total response rate among PGY-3 residents on the SARPL questionnaire was 62%; five additional residents were excluded from the analysis due to incomplete SARPL, bringing the total analytical sample to $N = 48$. Resident demographics are described in Table 2. We conducted Shapiro-Wilk tests to evaluate the assumption of normality for each dependent variable across rural and nonrural groups for both initial and current employment. Results indicated that rural attitude and individual factor scores were normally distributed ($P>0.05$ for all groups). We used independent samples *t* tests to examine differences in rural attitude score. Results showed that rural attitude score was significantly higher among participants who had a rural initial employment compared to those who did not ($P = 0.018$), and among those who had a rural current employment compared to those who did not ($P = 0.014$).

We used a MANOVA to examine the effect of initial employment (rural vs nonrural) on rural attitude factor scores ($N = 48$; nonrural $n = 31$, rural $n = 17$). The assumption of homogeneity of covariance matrices was met (Box's M $P = 0.353$). The multivariate effect of initial employment location was statistically significant (Wilks $\Lambda = 0.785$, $F[4,43] = 2.95$,

TABLE 1. Factors Contained in the SARPL Questionnaire

Rural attitudes factor	Questionnaire item
Friendliness and support	Staff are more supportive of each other in rural areas.
	People in rural areas are very friendly.
	In rural areas, new people are welcomed into the community.
	Rural workplace settings are friendly environments.
	There is a great sense of community in rural areas.
Isolation and socialization	Professional isolation is a problem when working in rural areas.
	There are limited places to go to socialize in rural areas.
	There are poor recreational facilities in rural areas.
	Working in a rural area means being too isolated from family.
	Working in a rural area means being too isolated from friends.
Enjoyable aspects of rural life	There are things I enjoy doing in rural areas.
	There are people in rural areas that I could be friends with.
	Living in a rural area provides an enjoyable lifestyle.
Work opportunities unique to rural practice	Working in a rural area provides more opportunity to practice a variety of skills.
	There are more opportunities for career advancement in rural areas.
	Rural practice provides greater opportunity for autonomy in work practice.
	Employment in a rural area is very desirable.
No factor	There are good opportunities for employment in rural areas in my profession

Abbreviation: SARPL, Student Attitudes to Rural Practice and Life

TABLE 2. Participant Characteristics (N = 48)

Demographic characteristic	n (%)
Race	
White	47 (97.9)
Other race	1 (2.1)
Ethnicity	
Hispanic or Latino	0
Not Hispanic or Latino	48 (100)
Age, in years	
25–29	17 (35.4)
30–34	28 (58.3)
35–39	3 (6.3)
Gender identity	
Male	25 (52.1)
Female	23 (47.9)
Gender nonbinary	0

P = 0.031). We conducted univariate follow-up analyses of variance (ANOVAs) using a Bonferroni-corrected α level of .0125 to control for Type I error inflation to understand which factor scores were driving this effect. We found statistically significant differences between the initial employment groups on friendliness and support (P = 0.007) and work opportunities factor scores (P = 0.005). Those with rural initial employment had significantly higher friendliness and support factor scores, as well as higher work opportunities factor scores, than those with nonrural initial employment (Table 3). We observed no statistically significant differences between the employment groups for the isolation or enjoyable aspects of rural life factors.

We also used a one-way MANOVA to determine the effect of current employment location on the four factor scores (N = 48; nonrural n = 30, rural n = 18). The assumption of homogeneity of covariance matrices was met (Box's M P = 0.303). The multivariate effect of current employment location was statistically significant (Wilks Λ = 0.790, F[4,43] = 2.86, P = 0.034). We conducted univariate follow-up ANOVAs using a Bonferroni-corrected α level of .0125 to control for Type I error inflation. We found statistically significant differences between the current employment groups on two of the four factors: friendliness and support (P = 0.006), and work opportunities (P = 0.006). Those with rural current employment had significantly higher friendliness and support factor scores, as well as higher work opportunities factor scores, than those with nonrural current employment (Table 3). We observed no statistically significant differences between the employment groups for isolation or enjoyable aspects of rural life factor scores.

DISCUSSION

This study contributes new insights by measuring rural attitudes among PGY-3 family medicine residents. Findings suggest that higher rural attitude scores, particularly in the factors of friendliness and support and work opportunities, are associated with greater likelihood of future rural employment location, supporting our hypothesis. We found no difference in perception of isolation and socialization factors between residents practicing in rural versus urban areas. One possible explanation is that isolation might be a perceived barrier that doesn't ultimately influence rural employment choice. Advances in technology such as improved digital connectivity

TABLE 3. Differences in Rural Attitude Scores Between Residents With Rural Versus Not Rural Initial and Current Employment Based on Independent Samples *t* Test (t Statistic) or Univariate Analysis of Variance (F Statistic) Results

Score	Employment	Rurality[a]	N	Mean (SD)	Test statistic[b]	*P*[c]
Rural attitudes score	Initial	Not rural	31	73.94 (8.62)	$t = -2.46$	.018
		Rural	17	80.59 (9.55)		
	Current	Not rural	30	73.73	$t = -2.57$	.014
		Rural	18	80.56		
Friendliness and support factor	Initial	Not rural	31	22.35 (2.39)	F = 7.98	.007
		Rural	17	24.47 (2.65)		
	Current	Not rural	30	22.30 (2.41)	F = 8.48	.006
		Rural	18	24.44 (2.57)		
Isolation and socialization factor	Initial	Not rural	31	19.94 (4.11)	F = 1.19	.280
		Rural	17	18.53 (4.53)		
	Current	Not rural	30	20.00 (4.17)	F = 1.40	.243
		Rural	18	18.50 (4.40)		
Enjoyable aspects of rural life factor	Initial	Not rural	31	13.52 (2.50)	F = 2.57	.115
		Rural	17	14.71 (2.37)		
	Current	Not rural	30	13.47 (2.53)	F = 2.97	.092
		Rural	18	14.72 (2.30)		
Work opportunities unique to rural practice factor	Initial	Not rural	31	17.61 (2.00)	F = 8.82	.005
		Rural	17	19.47 (2.21)		
	Current	Not rural	30	17.60 (2.03)	F = 8.30	.006
		Rural	18	19.39 (2.17)		

[a]Rural locations were grouped with "partially rural" designations, which reflect locations identified by the HRSA Rural Health Grants Eligibility Analyzer as meeting rural eligibility criteria.
[b]Differences in rural attitude score were examined using independent samples *t* test (*t* statistic), while differences in individual factor scores were examined using univariate analysis of variance (*F* statistic).
[c]**Significance** was based on the *t* statistic for independent samples *t* test and the *F* statistic for univariate analysis of variance (ANOVA). A Bonferroni-corrected α level of .0125 was applied to ANOVAs to control for Type I error inflation.
Abbreviations: HRSA, Health Resources and Services Administration; SD, standard deviation

and the rise of telehealth may mitigate traditional professional isolation in rural areas. Notably, residents with rural employment location scored significantly higher in overall rural attitudes, suggesting a possible reinforcing effect of exposure on attitude during training.

These results complement prior research indicating that rural exposure during training correlates with rural workforce outcomes.[1,2] Our findings are consistent with studies that have highlighted rural rotations and curricula as drivers of rural perceptions and eventual employment. Attitude assessment with a validated tool has the potential to assess resident rural interest, evaluate formative curricular elements, or outline key factors for enhancing experiences. Factors associated with rural employment include perceived friendliness and work opportunities, which when highlighted can inform curricular activity. Based on these findings, immersive, rural rotation experiences that include nonclinical integration and community engagement could help foster attitudinal changes and potential for rural employment.

Limitations of this study included the number of programs involved, the demographics of the surveyed population, curricular variation, selection bias, and our chosen rural definition. For example, if residents came to the program because of a preexisting interest in rural life and practice, the residency may have acted as a protector of rural attitudes rather than a transformer of them. Because the study focused on two programs with common aspects of their curriculum, the findings may not be generalizable across other residencies. Additionally, the demographic makeup of residents was not representative of the diversity found in other residency programs, and selection bias may influence these findings; residents who opted into rural placements may have entered training with more favorable views toward rural practice. Rurality is inherently challenging to define because it exists along a continuum and varies depending on the classification system used (eg, county-level vs census tract–level measures). In this study, we used the HRSA Rural Eligibility Analyzer definition, which captures rural areas at a granular level but may classify some locations as rural that are not intuitively perceived as such.[9] This definition also includes partially rural areas and could dilute the analysis. This definition may limit comparability with studies using alternative rurality definitions.

Future research may explore whether a threshold rural attitude score exists that could indicate the likelihood of rural employment, as well as whether changes in rural attitudes throughout residency have predictive value. The next iteration of this study ideally will examine changes in rural attitudes

over time, using PGY-1 data as a baseline. Approaching the study with PGY-1 baseline data would provide insight into whether the residency curriculum has influence on rural attitudes. Additional investigations may determine whether targeted interventions within residency can further shape rural attitudes among residents who may not have initially preferred rural practice.

CONCLUSIONS

PGY-3 family medicine residents with higher rural attitude scores had an increased likelihood of subsequent rural employment, suggesting that rural attitude assessments could be a tool to evaluate the rural curricular components of a program. Higher rural attitude scores for friendliness and support and work-related opportunities were prominent factors among residents who took rural positions after training.

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