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Preparing Nurse Practitioner Students for Rural and Underserved Practice

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Abstract

Background: Rural communities face persistent challenges pertaining to healthcare access, workforce shortages, and geographic isolation. To address these issues, the Rural Ready Nurse Practitioner (RRNP) Program was established through Health Resources and Services Administration (HRSA) Advanced Nursing Education and Workforce (ANEW) funding (Award # T94HP32889) to prepare nurse practitioners (NPs) for practice in rural and underserved areas. Purpose: The paper describes the development, implementation, and outcomes of our RRNP Program, emphasizing theoretical grounding in Rural Nursing Theory and integration of the Three R's of Rural Readiness: Relationships, Resources, and Reinforcement.

Methods: Program design involved multi-level strategies, including partnerships with rural clinical sites, integration of telehealth-based interprofessional education, and expansion of the

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Caring for Our Own Program (COOP) to support Indigenous graduate students. Data were drawn from HRSA tracking metrics and graduate self-reports.

Results: From 2021 to 2025, 31 RRNP Scholars completed the program, with 89% of graduates employed in rural and 93% employed in underserved areas. Key educational elements included annual in person Clinical Skills Days, customized medical kits, and Area Health Education Center (AHEC) Scholars Program.

Implications: The RRNP model demonstrates an evidence-based framework for preparing rural-ready nurse practitioners capable of meeting healthcare needs in (State)'s frontier and tribal communities.

Keywords: rural health, nurse practitioner education, workforce development, Rural Nursing Theory, underserved communities, Indigenous healthcare providers

Preparing Nurse Practitioner Students for Rural and Underserved Practice

Rural communities across the United States continue to experience persistent barriers to accessing primary and behavioral healthcare. These challenges are amplified in Montana, a state spanning 147,000 square miles with a population just over 1.1 million, 63% of whom reside in rural areas. Federally funded healthcare programs are the backbone of Montana's rural health care infrastructure. Montana's healthcare system includes approximately 59 hospitals, 49 of which are designated as Critical Access Hospitals (CAHs). The CAH program was established in 1997 as a part of the Balanced Budget Act (Rural Health Information Hub [RHIhub], n.d.-a). The program supports small hospitals in rural areas to serve residents who would otherwise have to travel great distances to receive healthcare services. There are 57 Federally Qualified Health Centers (FQHCs) in Montana, which are outpatient clinics that qualify for special reimbursement under Medicare and Medicaid (RHIhub, n.d.-b). Community health centers, migrant health services and health care for homeless programs are often funded by FQHCs. Indian Health Service (IHS) operate as a part of the Department of Health and Human Services and provide healthcare services to members of federally recognized American Indians and their descendants. Serving American Indian populations is a critical component of Montana's healthcare landscape.

Healthcare access in rural areas relies on the recruitment and retention of qualified health professionals. Without adequate supply of healthcare professionals, organizations are unable to provide much needed patient care. In Montana, provider shortages are acute: 51 of 56 counties are designated as Health Professional Shortage Areas (HPSAs). Despite numerous federally funded programs aimed at increasing the rural healthcare workforce, significant unmet needs persist, and provider supply remains far below demand.

Nurse Practitioners (NPs) comprise the second largest group of healthcare providers in primary care (Green et al., 2013). In contrast to the physician workforce, NPs are more likely to

work in rural communities and more likely to care for vulnerable populations such as those who receive Medicaid, are dual eligible for Medicaid and Medicare, women, Indigenous populations, persons of color, the uninsured, impoverished, and those living in rural areas (Buerhaus, 2018; Buerhaus et al., 2015; Desroches et al., 2013; Graves et al., 2016; Newhouse et al., 2011; Spetz et al., 2015; Xue et al., 2019).

The Montana State University (MSU) Mark and Robyn Jones College of Nursing (MRJCON) Rural Ready Nurse Practitioner (RRNP) initiative emerged in response to healthcare workforce gaps. Development and implementation of the RRNP program was grounded in the middle range rural nursing theory (Long et al., 1997; Long & Weinert, 1989; Long & Weinert, 2022) and informed by the three Rs of rural readiness: relationships, resources, and reinforcement. We will present an overview of the MRJCON RRNP program as well as descriptive statistics representative of program graduates currently in practice. We received exempt status from Montana State University Institutional Review Board (MSU IRB Protocol Approval: 2025-2488-EXEMPT). All participants in the RRNP have consented to have their information presented in scholarly journals and presentations as de-identified and aggregated data.

Methods

Theoretical Foundation

Rural nursing theory, developed by Drs. Kathleen Long and Clarann Weinert and further refined by Drs. Charlene Winters and Helen Lee, provides a conceptual foundation for understanding rural healthcare delivery as well as providing a theoretical framework for the development and deployment of the RRNP program at MSU. Authors Long, Scharff, and Weinert (1997) described the role of the rural nurse generalist as well as the advanced education of such generalists at MSU. Rural FNPs must be educated navigate significant uncertainty with confidence and possess the flexibility to respond to whatever walks through the door next. Role diffusion is a concept that has been explored within the context of rural nursing theory in an unpublished master's thesis completed by then MSU faculty member Jane Scharf. Scharff (1987) noted the rural nurse must be a jack of all trades within the realm of numerous health care disciplines. The role diffusion concept is applicable to the rural NP as well and serves as a theoretical and practical component of the education of NPs in rural settings. Rural nursing theory aligns with the RRNP program focus on the three Rs of rural practice, relationships, resources, and reinforcement.

Program Development

Using rural nursing theory and the three Rs of rural practice, we set out to design a program to build on already existing DNP program strengths and bolster areas identified as critical to practice success in rural and underserved populations. Participation in RRNP requires prior admission to the Doctor of Nursing Practice (DNP) program at MSU MRJCON. The RRNP program supports approximately twenty scholars per academic year with students at varying points across three- or four-year tracks. Recruitment efforts emphasize students from rural and frontier communities to improve workforce retention. As we assessed program outcomes after our first

year, the program shifted from sending urban based students to rural sites to instead supporting rural-based students in their home communities and augmenting clinical experience with specialty rotations in more urban centers within geographic referral region of each student.

The RRNP initiative also leverages the long-standing Caring for Our Own Program (COOP) at Montana CON. Originally focused on undergraduate Indigenous nursing students, COOP now extends support to graduate learners through RRNP, offering culturally responsive advising, mentoring, and wraparound support to promote recruitment, retention, and success.

Each RRNP Scholar also participates in the Montana Area Health Education Center (AHEC) Scholars Program, a two-year enhancement experience designed to strengthen healthcare professional's readiness for rural and underserved practice. The AHEC Scholars engage in 40 hours each of didactic and experiential learning annually, emphasizing behavioral health, social determinants of health, and telehealth simulations with interprofessional teams.

A hallmark feature of RRNP is the annual day-long Skills Day, developed collaboratively with clinical partners and students to meet identified educational and clinical needs. Topics include trauma simulation, FAST ultrasound exams, diagnostic imaging interpretation, suturing, and mental health interventions. These sessions foster peer connection and collaboration in the distance-based DNP program. Each Scholar also receives a customized medical kit, including a LED otoscope/ophthalmoscope, EKO stethoscope, DermLite, and Doppler, to support clinical readiness.

Results

Participants

Our first RRNP graduates completed in 2021, and the most recent cohort graduated in 2025. The majority of our graduates are female (90.3%, n = 28) and white (80.6%, n = 25). Among our alumni, there is a notably high proportion of Indigenous graduates. Montana is home to seven federally recognized reservations and twelve tribal nations, with 6.6% of the population identifying as Indigenous. The demographic characteristics of RRNP graduates are summarized in Table 1.

Table 1

Demographic Characteristics of RRNP Graduates (2021–2025)

Characteristic	n	%
Age		
25-35	15	48.4
36-45	15	48.4
46-55	1	3
Gender		
Female	28	90.3
Male	3	9.7
Ethnicity		
Non-Hispanic	30	96.8

Characteristic	n	%
Hispanic	1	3
Race		
White	25	80.6
American Indian	6	19.4
Practice Foci		
FNP	25	80.1
PMHNP	6	19.4

Note. Percentages may not total 100 due to rounding. Data derived from ANEW graduate tracking dataset (2025). Rural Ready Nurse Practitioner = RRNP, Family Nurse Practitioner = FNP, Primary Mental Health Nurse Practitioner = PMHNP.

To date we have graduated 31 RRNP Scholars with 93.5% (n=29) licensed and practicing as Nurse Practitioners. Two of our graduates are not currently employed as Nurse Practitioners however are using their doctoral degrees as a foundation to advance in research related fields.

Program Outcome: Rural Practice

A key outcome of the RRNP program is to increase the number of NPs in rural and underserved areas across our state. To measure practice rurality, we assigned Rural-Urban Commuting Area (RUCA) codes to graduate practice sites based on the practice sites zip code. A RUCA code of 1-3 was classified as Metropolitan (50,000 or more people with 10-30% primary commuting flow in or to the urban core; United States Department of Agriculture, 2025). A RUCA Code of 4-6 represents Micropolitan (10,000 to 49,999 people), RUCA 7-9 represents Small Town (2,500 or fewer people), and a RUCA of 10 represents Rural (fewer than 2,500 people), although in some cases a RUCA of 10 is identified as Frontier (United States Department of Agriculture, 2025). For the purposes of our assessment, we identified practice sites as rural if they had a RUCA code of 4 or higher, in compliance with HRSA grant guidelines. Of the 29 RRNP graduates employed as an NP, 89.7% (n = 26) are working in rural areas. 93.1% (n = 27) are working in primary care and/or mental healthcare provider shortage areas. Employment and practice outcomes are shown in Table 2.

Table 2

Employment and Practice Characteristics of RRNP Graduates (2021–2025)

Characteristic	n	%
Employed		
As an NP	29	93.5
Other	2	6.5
Employment Location Rurality	n = 29	
RUCA 1-3	3	10.3
RUCA 4-10	26	89.7
Employment in a Primary Care HPSA	n = 29	
Yes	27	93.1

No	2	6.9
Employment in a Mental Health HPSA	n = 29	
Yes	27	93.1
No	2	6.9

Note. Percentages may not total 100 due to rounding. Data derived from ANEW graduate tracking dataset (2025). Health Professional Shortage Area = HPSA, Rural Ready Nurse Practitioner = RRNP, Rural-Urban Commuting Area = RUCA.

Qualitative Participant Feedback

Scholars consistently reported that program component, including financial support, rural clinical placements, interdisciplinary learning, and statewide professional networking, enhanced their confidence and preparation for practice in rural and underserved communities. Two representative scholars' reflections are included below with permission from the scholars. These reflections illustrate the program's impact:

> The ANEW scholarship made it possible for me to attend Montana State University and pursue my degree as a Family Nurse Practitioner with a dedicated focus on rural health. This support opened doors for me to complete my clinical hours in rural Montana, allowing me to gain hands-on experience with the unique challenges and strengths of small, geographically isolated communities. Through this training, I developed a deeper understanding of the importance of accessibility, continuity of care, and trust in rural healthcare settings.
>
> Because of the ANEW scholarship, I was able to graduate without the burden of student loans. This financial freedom allowed me to accept a position based on passion rather than financial necessity. I am now working at One Health Sweet, a federally qualified health center serving City A and City B, Montana. ANEW also connected me to an invaluable network of professionals committed to improving rural healthcare. I regularly consult with ANEW mentors and peers from across the state, and their insight continues to shape my practice and support my growth as a rural health provider. I am forever grateful for the ANEW scholarship program and can say with confidence that if I had not participated in ANEW, I would not be where I am today." - RRNP Scholar Alum
>
> The interdisciplinary nature of ANEW's reach and education has made me aware of resources for providers and patients in our state that I would otherwise have missed. The opportunities to learn from a diverse assortment of professionals, and to serve in outreach clinics, has helped me be better prepared to meet the needs of rural residents in our large, sparsely populated state. And it's just been a heck of a lot of fun. -RRNP Scholar

Discussion

The RRNP Program demonstrates a robust and replicable model for preparing nurse practitioners to enter rural and underserved practice settings. Program outcomes, particularly the high proportion of graduates practicing in rural (89.7%) and health professional shortage areas (93%), affirm targeted educational strategies paired with contextualized support mechanisms can meaningfully address rural workforce gaps. The finding aligns with national data showing nurse practitioners are more likely than physicians to practice in rural and low-resource settings and are critical to sustaining access in communities with limited or aging physician supply (Buerhaus et al., 2018; Graves et al., 2016).

The integration of rural nursing theory provided a conceptual grounding that distinguished RRNP from traditional NP education models. Rural nursing theory acknowledges the complexity, unpredictability, and broad scope of rural practice. Rural practice requires adaptability, independence, and strong relational skills. Rural Ready Nurse Practitioner program features such as Skills Days, customized medical equipment kits, and telehealth-informed interprofessional education operationalize theoretical concepts such as role diffusion, resourcefulness, and rural context-specific decision-making. These educational elements intentionally cultivate the rural NP's ability to function effectively in environments characterized by limited resources, geographic isolation, and role generalization.

The RRNP Program's outcomes also highlight the pivotal role of rural origin and Indigenous identity in predicting post-graduation rural practice. The elevated proportion of Indigenous graduates is particularly meaningful given the significant workforce shortages within Montana's tribal health systems and the longstanding call for increasing representation of American Indian/Alaska Native (AI/AN) healthcare providers. The program's partnership with (Flagship Program) and its culturally responsive support structures may provide an explanatory pathway for this outcome and offer a framework for expanding Indigenous NP recruitment nationwide.

A unique strength of the RRNP model is its evolution from sending urban-based graduate students to rural placements toward supporting rural-based students within their home communities. The shift aligns with the evidence that students who train in rural communities, especially those who originate from rural areas, are more likely to stay in rural practice after graduation. Maintaining clinical training within a learner's community of origin reduces barriers, supports family and cultural ties, and enhances the authenticity of the educational experience.

At the same time, several limitations warrant consideration. The RRNP graduate sample size (n = 31) reflects a relatively small program typical of rural-serving institutions, which may limit generalizability. Workforce outcomes also rely partly on self-reported data, which could introduce reporting bias. Additionally, longer-term retention beyond initial employment is still being established; longitudinal tracking over five or more years is needed to assess sustained impact. Despite these limitations, the consistency of rural practice outcomes and strong alignment with national evidence suggests the program is effectively addressing Montana's unique workforce needs.

Looking forward, expansion of specialty rural clinical rotations, deeper integration with tribal health partners, and intentional development of behavioral health capacity among FNPs and PMHNPs represent priority areas for strengthening the program's statewide and regional impact. The RRNP model may also help guide rural-serving NP programs in other frontier states including Idaho, Alaska, and the Dakotas, where geographic barriers and workforce shortages parallel those in Montana.

Practice Implications

The outcomes of the RRNP Program yield several important implications for rural nursing practice, educational program design, and statewide workforce planning.

Rural Nursing Education Must Be Intentional, Context-Specific, and Theory-Informed. The application of rural nursing theory within RRNP provides a powerful demonstration of how middle-range theory can be operationalized in graduate nursing education. Embedding concepts such as rural context, isolation, self-reliance, role diffusion, and community connection within curricula prepares NPs with the cognitive flexibility and clinical judgment necessary to succeed in unpredictable rural environments. Graduate programs in other frontier states may benefit from adopting similar theoretical grounding.

Rural-Origin and Indigenous Students Are Essential Workforce Pipelines. Rural Ready Nurse Practitioner data reaffirm that recruiting students from rural and tribal communities is among the most effective strategies for increasing rural workforce retention. Programs should prioritize:

- admission pathways for rural- and frontier-based applicants,
- culturally responsive academic support systems,
- financial assistance that reduces reliance on high-wage urban positions to repay loans, and
- clinical immersion within home communities.

COOP's expansion into graduate nursing illustrates a sustainable approach for supporting Indigenous NP learners and improving workforce representation in tribal health systems.

Rural Clinical Readiness Requires Investment in Hands-On Skills and Equipment. Skills Days and individualized medical kits address two critical rural practice realities:

- rural providers must be prepared to perform a wide range of procedures due to limited specialty access, and
- many rural facilities lack consistent access to high-quality diagnostic tools. Providing graduates with equipment such as DermLites, Dopplers, and telehealth-ready stethoscopes improves clinical readiness, diagnostic accuracy, and confidence, particularly for new providers entering isolated practice settings
- Interprofessional, Telehealth-Enabled Education Strengthens Rural Care Delivery

Telehealth competency is no longer optional for rural practice. RRNP's integration of telehealth simulations and interdisciplinary collaborations through AHEC Scholars prepares graduates for team-based care models, remote consultations, and expanded digital care delivery—core strategies for reducing access barriers in geographically large states like Montana.

Academic Community Partnerships are Central to Rural Workforce Sustainability. Collaborations with critical access hospitals, FQHCs, tribal health departments, and rural preceptors proved essential for high-quality clinical placements. These partnerships should be maintained and expanded to:

- develop specialty rotations (behavioral health, emergency care, women's health),
- strengthen mentorship pipelines,
- improve preceptor development, and
- align educational outcomes with local workforce needs.

Sustained HRSA ANEW funding remains foundational for long-term viability of such partnerships.

Statewide Workforce Planning Should Prioritize NP Integration in Rural and Frontier Areas. The high percentage of RRNP graduates practicing in shortage areas underscores the capacity of NPs to fill persistent gaps in primary and behavioral healthcare. Policymakers should consider:

- continuing to support full practice authority for NPs,
- incentivizing rural-based preceptors,
- expanding loan repayment and scholarship programs, and
- incorporating rural NP pipeline programs into statewide staffing strategies.

Ongoing Retention Tracking Will Strengthen Longitudinal Workforce Impact. Establishing a five-year post-graduation tracking mechanism will provide more robust data on long-term workforce retention. These data can inform both academic program adjustments and statewide workforce projection models.

Conclusion

The RRNP Program's evolution illustrates a sustainable model for preparing nurse practitioners for rural and underserved practice. Recruitment and retention outcomes demonstrate students from rural or Indigenous backgrounds are significantly more likely to remain in rural communities after graduation (Spetz et al., 2017). The integration of annual Skills Days, participation in AHEC Scholars program, supplemental education and individualized medical kits enhances readiness and transition to practice.

The RRNP Program's success in graduating a high percentage of Indigenous nurse practitioners is particularly meaningful for Montana's tribal communities. Montana's seven

reservations and twelve tribal nations represent over 6% of the state's population. Indigenous graduates strengthen health equity and cultural competency within tribal and frontier settings.

The outcomes of RRNP hold implications for rural nursing education and workforce policy. Integration of rural nursing theory reinforces the importance of context-specific education, rural mentorship, and telehealth competency development. Sustained HRSA funding and academic–community partnerships remain essential for continued rural workforce growth. While program outcomes are strong, limitations include small sample size and reliance on self-reported data. Future work will expand partnerships with tribal health organizations and frontier facilities and track retention longitudinally over five years.

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