

REVIEW ARTICLE

Recruitment and retention of rural allied health professionals: a scoping review

AUTHORS



McKenzie Peterson¹ OTD, OTR/L, Occupational Therapist *



Sarah Nielsen¹ PhD, OTR/L, FAOTA



Devon Olson¹ MLIS, AHIP, Research and Education Librarian

CORRESPONDENCE

*Ms McKenzie Peterson petersonmckenzie3@gmail.com

AFFILIATIONS

¹ School of Medicine and Health Sciences, University of North Dakota, 26 3rd St NE, Crosby, MN 56441, USA

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ABSTRACT:

Introduction: The purpose of this study was to understand what literature exists to comprehend demographics and predicted trends of rural allied health professionals (AHPs), person factors of rural AHPs, and recruitment and retention of rural AHPs.

Methods: A scoping review was completed and reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews. Articles were analyzed using three a priori categories of recruitment and retention, person factors, and demographics and trends.

Results: Eighty articles met inclusion criteria for the review. Most of the literature came from Australia. Most research studies were qualitative or descriptive. A priori coding of the articles revealed overlap of the a priori codes across articles; however, the majority

of articles related to recruitment and retention followed by demographics and trends and person factors. Recruitment and retention articles focused on strategies prior to education, during education, and recruitment and retention, with the highest number of articles focused on retention. Overall, there were no specific best strategies. Demographic data most commonly gathered were age, practice location, profession, sex, gender, previous rural placement and number of years in practice. While person factors were not as commonly written about, psychosocial factors of rural AHPs were most commonly discussed, including desire to care for others, appreciation of feeling needed, connectedness to team and community and enjoyment of the rural lifestyle.

Conclusion: The evidence available provides an understanding of

what research exists to understand recruitment and retention of AHPs from a recruitment and retention approach, person factor approach, and demographics and trends approach. Based on this scoping review, there is not a clear road map for predicting or

Keywords:

allied health personnel, demographics, health workforce, job satisfaction, person factors, recruitment and retention, rural health services, rural practitioners, US.

FULL ARTICLE:

Introduction

Allied health professionals (AHPs) provide diagnostic, therapeutic, and custodial healthcare services. These services are provided by a wide variety of healthcare professionals. The definition of AHP excludes physicians, nurses, and oral health professionals¹. An inequitable rural–urban distribution of AHPs impacts on not only the delivery of healthcare services, but also on the retention of rural healthcare professionals^{2–9}. Forecast model research has assessed the supply and demand of both rural and urban allied healthcare services. These models have predicted continued increases in the gap between the number of available AHPs and the healthcare needs of the US^{10,11}.

While recent literature has begun to look more closely at the barriers that rural AHPs face, researchers have focused their assertions and discussions on the policy and legislation surrounding these challenges^{11,12}. These articles also focused on the current AHP workforce status within Australia, with limited inclusion of literature examining the US or other high-income countries. Although O'Sullivan and Worley¹¹ found that there is a need for increased national level and longitudinal research regarding the AHP workforce, and Edelman et al¹⁰ offered strategies to address issues at a legislative level, it remains unclear what specific organizational, managerial, and systemic level strategies have been found to be effective for strengthening the rural AHP workforce. The existing literature has primarily been presented with a target population of high-income countries operating with universal health care. An analysis completed to support the interpretation and application of findings within the US, a high-income country operating with a mixed coverage model, would be beneficial.

Therefore, the aim of this research was to identify what literature exists related to the rural AHP workforce, answering three main questions:

- What research exists related to assessing the demographics and predicted trends of rural AHPs?
- What evidence exists pertaining to the person factors (cognitive, physical, and psychosocial) of rural AHPs?
- What studies exist related the recruitment and retention of rural AHPs?

In the preliminary literature review, it was found that the main themes examined by existing literature targeted demographics and trends regarding the AHP workforce, the person factors of rural AHPs, and the strategies targeting recruitment and retention of rural AHPs. Based on the limited research available on rural AHPs, it was determined that a scoping review would be beneficial to further research as it would allow the authors to identify key characteristics of rural AHPs, and to establish a baseline of knowledge on the available rural AHP literature¹³.

maintaining AHPs in a rural workforce. Further research is needed to support increased recruitment and retention of AHPs in rural areas.

Methods

Protocol and registration

The protocol for this scoping review was drafted following the guidelines for reporting set forth in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)¹⁴. The protocol was not publicly available prior to the publication of this article.

Eligibility information

Literature was excluded from this scoping review if it was not published in English. Other exclusion criteria were related to the target population. If the literature was focused on physicians, oral health professionals, or nursing, it was excluded from this scoping review as the need for more research in those professions has been well documented compared to that of AHPs, which is the target population of this scoping review¹⁵. However, studies including AHPs along with physician, oral health professionals, or nursing were included. Finally, literature was excluded if it was not conducted in relation to a rural context. Literature that was retained met the inclusion criteria for being published in the years 2011–2021, with a target population of rural allied health service providers, and answered at least one of the research questions.

Database and information sources

Databases included in the search were Business Source Premier (EBSCO), CINAHL (EBSCO), PubMed, and SocINDEX (EBSCO). The hand search method used a snowballing of resources from scoping and systematic reviews found in the database searches.

Searches

Database searches were completed on 3 January 2022, by a medical librarian. An example of the search strings used in the database search is included in Appendix I. The primary author completed a hand search following a snowball method on 25 February 2022.

Selection of evidence

Once database searches were completed, two researchers reviewed all abstracts to screen for inclusion in the full-text review. If there was a disagreement with the decision for inclusion or exclusion, the source in question was discussed until a convergence of views was achieved.

Data charting and items

The authors used an Excel spreadsheet to track both peer-reviewed studies and grey literature that were reviewed. Data were extracted during the full-text review by the primary author, and was then reviewed by a second researcher. Data extracted included the title, author, year, country of origin, AHPs included, purpose

and research question, methodology, results, discussion and implications, and future research suggestions. The data extraction form tracked which of the three a priori categories the source was related to. If a source fell under multiple categories, the primary, secondary, or tertiary priority of those findings was determined and documented.

Critical appraisal of sources

Articles were appraised according to Tomlin and Borgetto’s (2011) research pyramid mode¹⁶ (see Table 1). Sources were assessed for rigor and validity during the review, but they were determined not to be of utmost importance in relation to the findings of this article; thus, only the main categories (peer reviewed, outcomes, descriptive, qualitative, experimental, or not research) will be reported in this article.

Table 1: Levels of evidence as outlined by Tomlin and Borgetto (2011)¹⁶

Not research	Experimental	Outcome	Qualitative	Descriptive
	(1) Single-subject study	(5) One-group pre/post study	(9) Study with one informant	(14) Individual case studies
	(2) Controlled clinical trial	(6) Case-control, preexisting groups	(10) Group study, less rigor	(15) Multiple case studies, normative studies, descriptive surveys
	(3) Randomized clinical trial	(7) Preexisting groups with covariates	(11) Group study, more rigor	(16) Association or correlation studies
	(4) Experimental meta-analysis	(8) Outcome meta-analysis	(12) Qualitative meta-analysis	(17) Systematic reviews of related descriptive studies

Synthesis of results

The findings of the scoping review were analyzed and coded according to each of the three research questions. The three research questions assessed demographics and trends of the AHP workforce, person factors of AHPs, and recruitment and retention strategies specific to AHPs. Recruitment and retention were further analyzed into the targeted phases: prior to tertiary education, during tertiary education, postgraduate recruitment, and retention. The evidence was organized and discussed in both table and narrative formats based on the a priori categories following the linear format of education, recruitment, reasons for leaving, and retention of the AHP workforce.

Ethics approval

Institutional review board approval was not obtained because no human subjects were involved.

Results

Selection of evidence

A total of 343 sources were identified between the database searches and subsequent hand search. After a full-text review, 80 articles were included in the scoping review (Fig1). Of the 80 sources, 42 were descriptive, 25 were qualitative, six were mixed methods, and seven were not research¹⁷. From the total number of articles, 77 were from peer-reviewed articles, with the remaining three providing valuable insights to the literature analysis justifying their inclusion within the review.

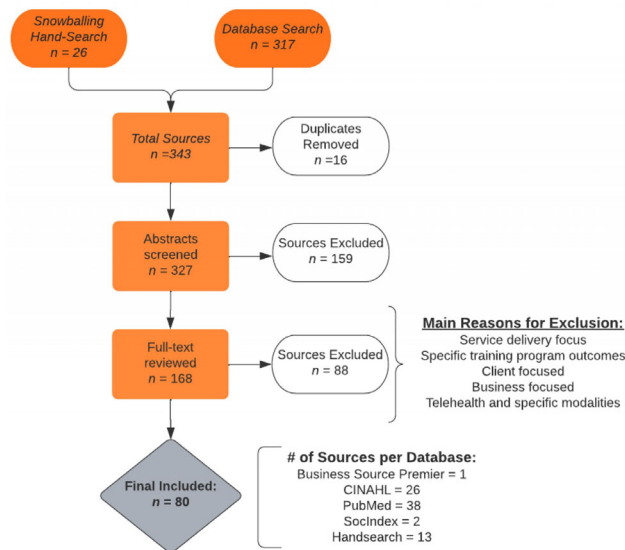


Figure 1: PRISMA-SCR flow chart.

Characteristics of evidence

The evidence included came from eight countries – Australia, the US, Canada, New Zealand, Africa, Ukraine, India, and Nepal – with

the frequency distributions shown in Appendix II. Twenty-three AHPs were represented in the articles, with inconsistent definitions of AHPs seen. Allied health professions included within the scoping

review were speech language pathology, occupational therapy, physical therapy, audiology, chiropractic, dietetics, environmental health, exercise physiology, imagery, medical laboratory, optometrist, orthotics and prosthetics, pharmacy, psychology, social work, diversional therapy, paramedic, counselor, behavioral support, nurse's aide, child life therapy, information management, and midwife. Fifty-six sources of evidence discussed multiple AHPs, and 25 sources only involved one AHP in their research. Professions that were examined in single-discipline studies included physical therapy, pharmacy, occupational therapy, social work, orthotics and prosthetics, and chiropractic.

Individual evidence

The literature included in the scoping review were analyzed into three a priori categories based on the initial research questions. The results of the analyses are presented below according to those categories.

Recruitment and retention

The most frequently published research addressed recruitment and retention, with 65 articles having key findings related to this topic, as seen in Table 2. Of those 65 articles, seven focused on the stage prior to tertiary education, 34 focused on changes made during the AHP education program, 33 addressed recruitment, and 52 focused on retention of AHPs. Various strategies were suggested for each stage of the recruitment and retention process. Strategies

encouraged in the literature regarding students prior to their AHP program included targeted recruitment, such as increased exposure to healthcare professions while in high school^{18,19} and offering quality K–12 dual enrolment programs²⁰.

During the AHP educational program time frame, suggestions involved institutional level modifications such as offering flexible delivery methods, extending rural health pipeline programs, and increasing available scholarships and supports for students. Suggestions at the educational phase also discussed additional curricular topics that should be considered when educating and encouraging future rural health practitioners^{18,19,21-24}. These curricular topics included population health and social determinants of health, with one source suggesting that a specialist generalist practitioner role be considered to better meet the needs of rural communities struggling with understaffing^{22,23}. The specialist generalist role refers to the unique skills and knowledge held by rural practitioners, as they need to maintain a broad expertise for treating such a diverse caseload²². Strategies also included ways to improve clinical placements, such as thorough pre-placement briefings and orientation, allowing students opportunities to get involved in the rural community within which they are learning, and helping with finding accommodations or funding the placement²⁵⁻³¹. Gray et al (2019)²⁹ found that promoting student self-efficacy could reduce feelings of isolation, which are also commonly reported in rural AHPs^{5,23,27,29,32-44}.

Table 2: Literature targeting recruitment and retention^{3,5,6,8,10,11,13,15,18,21-35,37-40,42-79}

Author (year)	A priori category (numbered on clinical priority assessed)	Design (numbered based on specific level of evidence in Table 1)	Key findings
Berg-Poppe et al (2021) [ref. 3] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 2	The authors found that health provider shortage area AHPs placed higher value on professional advancement, relationships, and financial considerations.
Berry and Hosford (2015) [ref. 42] [†]	1 Person factors 2 Demographics and trends 3 Recruitment and retention	Descriptive 2	It is important for administrative professionals to know that 38.9% of participants scored moderate to high in emotional exhaustion, indicating potential risk of burnout.
Brocius et al (2019) [ref. 45] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 6	Demonstrated the success of a Grow Your Own program that both met the needs of learners and produced lasting rural workforce impacts.
Brown et al (2017) [ref. 46] [†]	1 Demographics and trends 2 Recruitment and retention	Descriptive 16	Found that the efforts being made to support rural clinical placements had a positive impact on workplace intentions.
Campbell et al (2013) [ref. 37] [†]	1 Person factors 2 Demographics and trends 3 Recruitment and retention	Descriptive 2	Differences were identified between genders in this study, with women being higher in harm avoidance, cooperativeness, and reward dependence. Differences were also noted by age group and rurality.
Campbell et al (2021) [ref. 47] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 15	Several factors were significantly associated with working in a rural or remote area: rural origin of the AHP, influence of clinical placement, and >10 weeks of clinical placements.
Campbell et al (2012) [ref. 48] [†]	1 Person factors 2 Recruitment and retention	Qualitative 11	20 extrinsic and 18 intrinsic factors were identified as having an influence on recruitment and retention. Positive extrinsic factors included rural lifestyle, diverse caseload with broad experiences, and family nearby. Intrinsic motivators included autonomy, community, connectedness, teamwork, and challenge.
Campbell et al (2021) [ref. 22] [†]	1 Demographics and trends 2 Recruitment and retention	Descriptive 15	Overall, student satisfaction with their clinical placements was high. This was attributed to high-quality clinical supervision and access to educational resources.
Chisholm et al (2011) [ref. 49] [†]	1 Recruitment and retention	Descriptive 2	Some workforce turnover and retention factors vary by geographical location, town size, profession, and career grade. The authors recommended that national data collection occur to improve the diversity and generalizability of the findings.
Cosgrave (2021) [ref. 39] [†]	1 Recruitment and retention	Qualitative 11	Authors developed 10 recommendations across the three theoretical domains: workplace/organization, role/ career, and community/place.
Cosgrave et al (2019) [ref. 28] [†]	1 Recruitment and retention	Qualitative 11	Four main themes were identified: rural familiarity and interest, social connection and place integration, community participation and satisfaction, and fulfillment of life aspirations. It was found that community and job satisfaction were linked.
Cosgrave (2020) [ref. 50] [†]	1 Recruitment and retention	Qualitative 10	Themes identified in this study were largely negatively impacting on recruitment and retention of AHPs.
Cosgrave et al (2018) [ref. 51] [†]	1 Recruitment and retention	Qualitative 11	Two main factors impacted on intention to leave for rural community mental health providers: managing the job and adapting to the workplace.
Cosgrave et al (2018) [ref. 44] [†]	1 Recruitment and retention	Qualitative 10	Professional satisfaction was affected by scope of practice, workplace relationships, and access to continuing professional development and career advancement. These varied by the practitioner stage of adjustment. Turnover intention was typically decided by 12–18 months.
Couch et al (2021) [ref. 23] [†]	1 Recruitment and retention	Descriptive 17	The five key themes found were career development, clinical load, organization and workplace structure, prior exposure, and personal factors.
Devine et al (2013) [ref. 21] [†]	1 Recruitment and retention	Descriptive 15	Authors identified four main themes related to recruitment and retention: advantages and issues of new grads in rural practice, scholarship effectiveness, recommended changes for scholarships, and support strategies for new graduates.
Durey et al (2015) [ref. 52] [†]	1 Recruitment and retention	Not research	Authors highlighted that the 'conventional pipeline' mainly targets local AHPs.
Edelman et al (2020) [ref. 10] [†]	1 Demographics and trends 2 Recruitment and retention	Descriptive 11	The continued workforce shortages highlight the importance of investing in the evaluation and reform of the existing educational pathways and governmental structures that impede timely recruitment.
Elwood (2021) [ref. 53] [†]	1 Recruitment and retention	Not Research	A lack of national workforce data raises concerns about whether the existing workforce can meet the growing demands and shifting delivery methods.
Fleming and Spark (2011) [ref. 54] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 15	Factors impacting on rural employment decision included rural internship and spouse/partner rural background, and factors negatively impacting were working in a hospital pharmacy. Rural clinical placements were more often undertaken by those with rural childhood or attending a rural university.
Fragar and Depczynski (2011) [ref. 43] [†]	1 Person factors 2 Recruitment and retention	Qualitative 10	Ageing AHPs reported concerns and work limitations that were consistent with expected ageing changes. The study found that rural practitioners were more likely to experience compassion fatigue, possibly due to losing well-known patients.
Furness et al (2019) [ref. 55] [†]	1 Recruitment and retention 2 Person factors	Qualitative 10	Rural clinical placements offer AHP students unique opportunities for students to 'think, feel, and act' like an AHP. The generalist experiences promote skill integration and can provide opportunities for skill development and confidence building.
Gallego et al (2016) [ref. 5] [†]	1 Recruitment and retention	Descriptive 15	Motivators for rural practice included need for autonomy, available child care, friends and family nearby, and partner employment opportunities. The authors identified that all of these require increased flexibility.
Gallego et al (2015) [ref. 56] [†]	1 Recruitment and retention 2 Demographics and trends	Qualitative 11	Six themes were identified as impacting on recruitment and retention: travel burden, work flexibility, professional support, access to continuing professional development, autonomy of practice, and remuneration.
George et al (2019) [ref. 57] [†]	1 Recruitment and retention	Not research	Based on the needs of rural population and inadequate practitioners, a rural generalist role may be effective to address the needs of rural practice.
Gray et al (2019) [ref. 29] [†]	1 Recruitment and retention	Descriptive 2	Key themes: adjusting to being away from home, adjusting to university culture, and differing experiences of mature age students.
Hanson and Jedlicka (2015) [ref. 58] [†]	1 Recruitment and retention	Not Research	Students benefit from social supports when on clinical placements, and thus may benefit from a greater awareness of available resources prior to going on a placement.
Haskins et al (2017) [ref. 6] [†]	1 Demographics and trends 2 Recruitment and retention	Descriptive 15	Participant perceptions and reported quality of life in rural areas were negative, largely due to environmental factors.
Hays et al (2020) [ref. 59] [†]	1 Recruitment and retention	Qualitative 10	Three main themes were identified: pharmacy workforce, practice environment, and social factors. Rural pharmacy practice had unique challenges and benefits.
Jessup et al (2021) [ref. 60] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 16	Three key lessons: gaining employment takes time (2–6 months average), rural employment may be a way to enter the job market more quickly compared to in urban settings, and learning to compromise is key in a precarious job market.
Keane et al (2013) [ref. 33] [†]	1 Recruitment and retention 2 Demographics and trends	Qualitative 15	The high clinical demands may increase intention to leave.
Keane et al (2012) [ref. 61] [†]	1 Recruitment and retention	Descriptive 11	Five main themes were identified as both push and pull factors: personal factors, workload/type of work, continuing professional development, impact of management, career progression. Key pull factors included personal factors and continuing professional development, while impact of management tended to be a push factor.
Keane et al (2011) [ref. 30] [†]	1 Demographics and trends 2 Recruitment and retention	Descriptive 2	A need to grow the young AHP workforce was identified based on the reports of upcoming attrition.
Kumar et al (2020) [ref. 13] [†]	1 Recruitment and retention	Qualitative 10	Identified five main themes regarding rural recruitment and retention: nature of rural practice, exposure to rural 'taster', social and lifestyle, job availability and characteristics, and mentor and support.
Lai et al (2018) [ref. 62] [†]	1 Recruitment and retention	Descriptive 17	Four main categories: structural, health/education system, organizational, and individual-level factors. Identified a need for clear roles, scope of practice, and responsibilities.
Lincoln et al (2014) [ref. 40] [†]	1 Recruitment and retention	Qualitative 10	Three main themes: flexible recruitment, retention strategies, and challenges to retention. Negative impacts that were reported included a lack of resources, heavy workload, and top-heavy organizational structures.
Ling et al (2018) [ref. 63] [†]	1 Demographics and trends 2 Recruitment and retention	Descriptive 16	Found that student debt was not a deterrent from rural practice, with other influences being more likely to influence students and new graduates in considering work locations.
Lyle and Greenhill	1 Recruitment and retention	Descriptive	Rural academic centers play an important role in encouraging high school students to pursue

Eye and Greenhill (2018) [ref. 64] [†]	1 Recruitment and retention	Descriptive 14	Rural academic centers play an important role in encouraging high school students to pursue AHP careers. It was found that rural clinical schools were successful at encouraging early-career rural practice.
Martin et al (2021) [ref. 31] [†]	1 Person factors 2 Recruitment and retention	Qualitative 11	19 key competencies were identified as important for rural physical therapists, including broad concepts such as isolation, limited resources, and determinants of health, along with intrinsic factors.
Matichuk et al (2016) [ref. 18]	1 Recruitment and retention 2 Person factors	Not research	Positive factors for rural recruitment included rural origin, proximity to family, and a rural education. Positive retention factors included job satisfaction and the rural lifestyle. Beneficial person factors reported included being eager, open-minded, resourceful, brave, and a reflective practitioner.
McKinstry and Cusick (2015) [ref. 65] [†]	1 Recruitment and retention	Not research	Authors made suggestions for improving recruitment and retention in rural mental health throughout the career.
Minisini et al (2011) [ref. 66] [†]	1 Person factors 2 Recruitment and retention	Qualitative 10	Rural physical therapists take on generalist skill set and role in their communities. The authors identified a need to assess the effectiveness of current recruitment and retention strategies.
O'Sullivan and Worley (2020) [ref. 11] [†]	1 Recruitment and retention	Qualitative 11	Issues that affected retention included high clinical demands, which were influenced by the limited practitioners and increased with rurality.
Quilliam et al (2021) [ref. 34] [†]	1 Recruitment and retention 2 Demographics and trends	Qualitative 11	There is a lack of literature about mature-aged students. Barriers that were more impactful for mature-aged students included juggling responsibilities, caring for family, working, and navigating the higher education system.
Redford (2019) [ref. 67] [†]	1 Recruitment and retention	Not Research	Barriers continue to exist regarding the development of a strong rural workforce.
Ridgewell et al (2016) [ref. 68] [†]	1 Demographics and trends 2 Recruitment and retention	Experimental 2	This highlighted the need for recruitment strategies to target states with ageing client populations.
Roots and Li (2013) [ref. 69] [†]	1 Recruitment and retention	Qualitative 12	Three main themes were identified: availability of professional support, opportunities for professional growth, and nature of rural practice. It was noted that the same factors that attract people to rural practice are often the reasons they leave.
Roots et al (2014) [ref. 32] [†]	1 Recruitment and retention 2 Demographics and trends	Qualitative 11	Participants reported how rural practice goes beyond rehabilitation and highlighted the importance of understanding the impacts of the environment and other determinants of health in a rural setting.
Roots et al (2014) [ref. 70]	1 Person factors 2 Recruitment and retention	Qualitative 10	Practitioners entering rural practice need a broad range of skills, including being resourceful and creative.
Russel et al (2017) [ref. 27] [†]	1 Recruitment and retention	Qualitative 11	Geographical location was the strongest factor affecting retention. Some differences were noted between retention of various AHPs. Six retention domains were identified: geographical location, professional and organizational factors, finances and economics, regulatory factors, education, and family and personal factors.
Schmidt and Dmytryk (2014) [ref. 35] [†]	1 Recruitment and retention	Qualitative 11	This study found that mixed-sector jobs (public and private) offered broad work experiences and a diverse workload, and improved mentorship and supports for new graduates.
Shah et al (2018) [ref. 71] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 15	By offering more rural clinical placements, more physical therapists will have a chance to have a positive rural placement experience, which could have lasting effects on recruitment.
Slagle et al (2012) [ref. 8] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 15	This study demonstrates that there are key differences between urban and rural recruitment strategies. Rural respondents were more likely to report management influencing their retention.
Smedts et al (2013) [ref. 72] [†]	1 Recruitment and retention	Descriptive 2	Concerns were raised about the high number of professionals reporting an intention to leave their current job within 5 years. A link between intention to stay and professionals who provided student supervision was found.
Smith et al (2018) [ref. 73] [†]	1 Demographics and trend 2 Recruitment and retention	Qualitative 11	Three key themes: preparation and support, rural experience, and rural lifestyle and socialization. Student clinical placement satisfaction was strongly influenced by a diverse learning environment and a positive relationship with their supervisor.
Smith et al (2013) [ref. 15] [†]	1 Recruitment and retention	Descriptive 15	The main drivers for rural practice intention were lifestyle and quality of life, rural background, business and job opportunities, family reasons, and personal and professional satisfaction. Barriers included work-life balance, career advancement, and workplace conflicts.
Smith et al (2011) [ref. 74] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 2	Significant workforce shifts due to the retirement of the 'baby boomer' workforce. Noted a significant decrease in respondent satisfaction with access to continuing professional development.
Smith et al (2021) [ref. 38] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 15	This study found that students with rural origins were more likely to have undertaken rural clinical placements, and to have more cumulative placement days.
Smith et al (2018) [ref. 75] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 15	The authors found that overall placement satisfaction highly correlated with rural work intention.
Spiers and Harris (2015) [ref. 76] [†]	1 Recruitment and retention	Qualitative 10	The authors identified barriers and enablers related to the rural tertiary transition, and clinical placement transitions.
Sutton et al (2021) [ref. 25] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 15	Individuals of rural origin were four times more likely to work in a rural location. Other important factors were the number of cumulative days at a rural clinical placement and undertaking an additional rural placement.
Taylor et al (2019) [ref. 77] [†]	1 Recruitment and retention 2 Demographics and trends	Qualitative 11	Factors likely to influence practice location included rural background, family and partners, rural lifestyle, income, and job availability. Positive clinical placements are also strong influences.
Terry et al (2021) [ref. 26] [†]	1 Recruitment and retention	Descriptive 17	Five key themes were identified as impacting rural recruitment and retention: geographic and family factors, economics and resources, scope of practice, practice environment, and community factors.
Wantanabe-Galloway et al (2015) [ref. 24] [†]	1 Recruitment and retention	Qualitative 10	Identified 10 factors affecting recruitment and retention, with improved recruitment success reported when the applicant was from a rural area. Important qualities for applicants included personal initiative, networking skills, and a passion to serve.
White and Humphreys (2014) [ref. 78] [†]	1 Recruitment and retention	Qualitative 10	Students voiced concerns about accommodation, finances, and available community facilities when considering undertaking rural placements.
Winn et al (2014) [ref. 79] [†]	1 Recruitment and retention 2 Demographics and trends	Descriptive 15	Positive recruitment factors included working in an underserved area, and lifestyle options. Retention was linked to job satisfaction and available professional networks.

[†] Research, peer reviewed. [‡] Not research, peer reviewed.
AHP, allied health professional.

Demographics and trends

The evidence included in this study assessed a wide variety of demographics, with the most common demographics collected being age, practice location, profession, sex, gender, rural clinical placement, rural background, and number of years in practice, as displayed in Table 3. Operational definitions were not used in the data and several terms were used interchangeably, including sex and gender, and career, profession, occupation, and discipline.

While many studies included demographics in their research, sources that only addressed demographics examined factors such as: socioeconomic status and financing of one's education, gender

differences between AHPs, shifts in employment status, general environmental scans of a range of AHPs, longitudinal practice trends, AHP prevalence by region, generational differences, practice characteristic differences, and service differences influenced by practice location and practice sector^{40,46-53,68,74}. By selecting up-to-date research, it was identified that more recent studies are no longer examining broad generational characteristics identifying workforce practitioner differences based on age. Rather, demographics were more focused on specific differences, such as the increase in female practitioners, specifically within the orthotic/prosthetic workforce or in practice sector impacts on practice, with some researchers examining the potential for inter-sector collaboration for increased practitioner supports^{46,50,68,69}.

Table 3: Most common demographic factors assessed^{2-4,6,8,10,17,19,20,22,25,30,32-34,36-38,41,42,45-47,54,56,60,63,68,71,73-75,77,79-85}

Author (year)	Design (see Table 1)	Age	Practice location	Profession	Sex	Gender	Rural clinical placement	Rural background	Number of years in practice
Adams et al (2016) [ref. 80] [†]	Descriptive 15		X	X		X			X
Adams et al (2019) [ref. 81] [†]	Descriptive 15	X		X	X				X
Bacopanos and Edgar (2016) [ref. 2] [†]	Descriptive 15	X	X	X		X			X
Bath et al (2015) [ref. 82] [†]	Descriptive 2	X	X	X	X				
Berg-Poppe et al (2021) [ref. 3] [†]	Descriptive 2	X	X	X		X	X		
Berry and Hosford (2015) [ref. 42] [†]	Descriptive 2		X	X	X				X
Brocius et al (2019) [ref. 45] [†]	Descriptive 6	X	X	X		X			
Brown et al (2017) [ref. 46] [†]	Descriptive 16			X		X	X		
Campbell et al (2013) [ref. 37] [†]	Descriptive 2	X	X	X		X	X	X	X
Campbell et al (2021) [ref. 47] [†]	Descriptive 15	X		X	X		X	X	
Campbell et al (2021) [ref. 22] [†]	Descriptive 15	X		X	X		X	X	
Rispel et al (2019) [ref. 83] [†]	Descriptive 15	X		X		X			
Edelman et al (2020) [ref. 10] [†]	Descriptive 11			X					
Fleming and Spark (2011) [ref. 54] [†]	Descriptive 15	X		X		X	X	X	
Foo et al (2017) [ref. 4] [†]	Descriptive 15	X	X	X		X			X
Gallego et al (2015) [ref. 20] [†]	Descriptive 2	X		X		X			
Gallego et al (2015) [ref. 56] [†]	Qualitative 11	X	X	X				X	
Haskins et al (2017) [ref. 6] [†]	Descriptive 15	X	X	X					X
Jessup et al (2021) [ref. 60] [†]	Descriptive 16		X	X			X	X	
Jessup et al (2021) [ref. 19] [†]	Descriptive 16		X	X		X			
Keane et al (2013) [ref. 33] [†]	Qualitative 15	X		X		X		X	
Keane et al (2011) [ref. 30] [†]	Descriptive 2	X	X	X	X			X	
Ling et al (2018) [ref. 63] [†]	Descriptive 16		X	X					
Nancarrow et al (2017) [ref. 41] [†]	Descriptive 15	X	X	X		X			
Playford et al (2020) [ref. 84] [†]	Experimental 2		X	X	X		X	X	
Quilliam et al (2021) [ref. 34] [†]	Qualitative 11			X					
Ridgewell et al (2021) [ref. 17] [†]	Descriptive 16	X	X	X		X			
Ridgewell et al (2016) [ref. 68] [†]	Experimental 2	X	X	X		X			
Roots et al (2014) [ref. 32] [†]	Qualitative 11			X				X	X
Shah et al (2018) [ref. 71] [†]	Descriptive 15			X			X		
Slagle et al (2012) [ref. 8] [†]	Descriptive 15		X	X					
Smith et al (2018) [ref. 73] [†]	Qualitative 11	X		X		X	X		
Smith et al (2011) [ref. 74] [†]	Descriptive 2	X		X		X	X	X	X
Smith et al (2021) [ref. 38] [†]	Descriptive 15	X	X	X			X	X	
Smith et al (2018) [ref. 75] [†]	Descriptive 15	X		X		X			
Sutton et al (2021) [ref. 25] [†]	Descriptive 15			X		X	X	X	
Taylor et al (2019) [ref. 77] [†]	Qualitative 11	X	X	X			X	X	X
Whitford et al (2012) [ref. 36] [†]	Descriptive 2	X	X	X		X	X	X	
Winn et al (2014) [ref. 79] [†]	Descriptive 15	X		X	X		X		X
Yisma et al (2021) [ref. 85] [†]	Descriptive 15		X	X					

[†] Research, peer reviewed. [‡] Not research, peer reviewed.

Person factors

Out of the 80 pieces of evidence included in this review, only 11 addressed the person factors of rural AHPs. Most of the evidence

regarding person factors was qualitative ($n=6$), with a mix of descriptive, mixed methods, and non-research as well¹⁷. The literature that addressed person factors is presented in Table 4.

Table 4: Literature addressing person factors^{18,20,31,37,42,43,48,55,66,70,86}

Author (year)	A priori category	Design (see Table 1)	Key findings
Anzenberger et al (2011) [ref. 86] [†]	1 Person factors	Descriptive 16	Rural intent students were more intrinsically motivated. Key indicators for pharmacy students to consider rural practice included interest in operating a privately owned pharmacy, and their expectations of rural life.
Berry and Hosford (2015) [ref. 42] [†]	1 Person factors 2 Demographics and trends 3 Recruitment and retention	Descriptive 2	It is important for administrative professionals to know that 38.9% of participants scored moderate to high in emotional exhaustion, indicating potential risk of burnout.
Campbell et al (2013) [ref. 37] [†]	1 Person factors 2 Demographics and trends 3 Recruitment and retention	Descriptive 2	Differences were identified between genders in this study, with women being higher in harm avoidance, cooperativeness, and reward dependence. Differences were also noted by age group and rurality.
Campbell et al (2012) [ref. 48] [†]	1 Person factors 2 Recruitment and retention	Qualitative 11	20 extrinsic and 18 intrinsic factors were identified as having an influence on recruitment and retention. Positive extrinsic factors included rural lifestyle, diverse caseload with broad experiences, and family nearby. Intrinsic motivators included autonomy, community, connectedness, teamwork, and challenge.
Fragar and Depczynski (2011) [ref. 43] [†]	1 Person factors 2 Recruitment and retention	Qualitative 10	Ageing AHPs reported concerns and work limitations that were consistent with expected ageing changes. The study found that rural practitioners were more likely to experience compassion fatigue, possibly due to losing familiar, longstanding patients.
Furness et al (2019) [ref. 55] [†]	1 Recruitment and retention 2 Person factors	Qualitative 10	Rural clinical placements offer AHP students unique opportunities for students to 'think, feel, and act' like an AHP. The generalist experiences promote skill integration and can provide opportunities for skill development and confidence building.
Gallego et al (2015) [ref. 20] [†]	1 Person factors 2 Demographics and trends	Descriptive 2	Intrinsic and extrinsic factors were identified as having an influence on work location. Personal motivators for rural practice included community connection, rural lifestyle, and rural upbringing or training.
Martin et al (2021) [ref. 31] [†]	1 Person factors 2 Recruitment and retention	Qualitative 11	19 key competencies were identified as important for rural physical therapists. These competencies included broad concepts such as isolation, limited resources, and determinants of health, along with intrinsic factors.
Matichuk et al (2016) [ref. 18]	1 Recruitment and retention 2 Person factors	Not research	Positive factors for rural recruitment included rural origin, proximity to family, and a rural education. Positive retention factors included job satisfaction and the rural lifestyle. Beneficial person factors reported included being eager, open-minded, resourceful, brave, and a reflective practitioner.
Minisini et al (2011) [ref. 66] [†]	1 Person factors 2 Recruitment and retention	Qualitative 10	Rural physical therapists take on generalist skill set and role in their communities. The authors identified a need to assess the effectiveness of current recruitment and retention strategies.
Roots et al (2014) [ref. 70]	1 Person factors 2 Recruitment and retention	Qualitative 10	Practitioners entering rural practice need a broad range of skills, including being resourceful and creative.

[†] Research, peer reviewed.
AHP, allied health professional.

Authors of the literature included in this scoping review have investigated cognitive, physical, and psychosocial factors that influence an individual's decision and abilities to successfully practise in rural communities. The literature available does touch on all three of the person components, but the psychosocial domain has the most robust findings. The methods of assessing person factors varied across studies, with some having used valid and reliable assessments such as the Maslach Burnout Inventory and the Rural and Remote Allied Health Motivation and Personality survey, while other studies used focus groups to discuss personal qualities and skills that were beneficial for rural practitioners^{53,71}.

Cognitive skills and abilities identified in the literature included managing potential ethical conflicts, understanding the needs of rural communities, using technology to support clients, and being reflective practitioners to enhance their skills^{21,67}.

While physical skills were rarely discussed, one article focused on age-related changes that impact on more experienced therapists, including musculoskeletal changes, visual decline, increased fatigue, and decreased fine motor dexterity⁴³. Other skills included skill integration specific to rural practice, and proactively managing one's own health and resilience^{21,62}.

The most discussed person factors present in the literature addressed psychosocial features. The features identified were either rural community focused or individual-level practitioner skills and traits. The community-focused traits included a desire to care for others, appreciation of feeling needed by the community, feelings of connectedness to the multidisciplinary team and surrounding community, and an enjoyment of a rural lifestyle^{23,33,62-66}. Individual-level characteristics highlighted both positive traits and potential barriers to overcome. Positive traits for rural practitioners consisted of resourcefulness, flexibility, bravery, confidence, assertiveness, cooperation, and integrity^{21,23,33,67,71}.

Research also found that rural practitioners tended to be self-directed and novelty seeking, with lower harm avoidance than their urban counterparts^{21,53,71}. Additionally, research identified several barriers that rural practitioners often had to overcome, such as emotional exhaustion, depersonalization, being overwhelmed, and a potential lack of community acceptance^{33,53,71}.

Discussion

Summary of evidence

Education plays an important role in influencing AHP workforce outcomes because it fosters the development of future practitioners^{19,29,30,56,65}. There are several ways educational programs can encourage students to consider future rural practice. Structural supports that schools can offer include flexible delivery options, established gathering spaces to support social connection, and financial supports through scholarships and grants to ease extraneous burdens that can impede student success^{26,32,41,56}. There are also curricular topics that are beneficial for increasing a student's understanding of the multitude of influences that affect an individual's health. These include population health, social determinants of health, interprofessional practice, and the AHP role in mental health^{19,22,23}. These topics are particularly relevant for rural practitioners, who probably have an extended scope of practice^{14,57}. Educational programs should also consider and educate students as to the core competencies that practitioners identify as valuable for successful rural practice²¹. Core competencies identified by Martin et al (2021) included intrinsic factors such as flexibility, independence, and resourcefulness³¹. Lastly, rural clinical placements are beneficial for students because they allow students to experience the realities of rural practice and gain hands-on skill integration⁵². Immediately following rural clinical placements, students self-reported interest

in future rural practice was 70–84%^{46,48,55,66}. Time spent on clinical placements is important for students and employers to consider what skills, abilities, and person factors are most valuable for their future employment. Studies have demonstrated that person factors can be both positive and negative, depending on a wide range of extrinsic and intrinsic influences. One example of this is how a person views personal accomplishments, because it can be motivating for some practitioners, but can be a negative influence if it is absent or less valued by the practitioner^{33,53}. Educational programs can also support this by having clear communication with their clinical placement sites in order to assess what skills and abilities the site looks for in employees, then sharing that with students so they can be prepared for the workforce²¹.

Recruitment of AHPs is a vital part of growing the healthcare workforce, and it benefits from the use of specific strategies to bolster the outcomes^{37,39,48,66}. Demographic research demonstrated that while AHP workforce is growing, it continues to grow at the same rate as population growth. This means that there continues to be an inadequate AHP-to-population ratio^{60,70,87}. It is important to consider the multitude of experiences, values, and needs of healthcare professionals when attempting to fill a job opening. The available literature discussed the importance of using targeted recruitment in order to increase exposure to rural healthcare professions when students start seriously considering their future career paths^{18,19}. At the individual level, practitioner values and demographics should be considered to assess the fit, both introspectively by the applicant, and by the hiring team^{21,33,67,73,79}. Any recruitment strategies used by rural clinics should be flexible and would be most beneficial if they were tailored to each applicant^{3,6,34,43,73}. The organizational-level strategies focused on supporting new employees by offering financial and professional supports^{8,12,19,23,43,52,59,63,71}. A key strategy to support new staff, particularly individuals with no close ties to the community in which they will be working, is to ensure that there are opportunities for the new staff to engage with the team and the surrounding community, which offers social supports and can decrease personal and professional isolation^{6,12,23,43}.

In the time following the recruitment of an AHP, certain experiences or lack of support may increase the likelihood of that professional leaving the job. While research demonstrates that job turnover is multi-faceted, certain personal, professional, and environmental factors were reported as main influences for leaving one's job, also referred to as 'push factors'²⁻⁶. Professional push factors included a lack of career advancement opportunities, seeking better remuneration, and retirement, which vary with the sector and location of one's employment^{3,6,40,45,74}. Some studies found that respondents had concerns about environmental factors such as poor housing or accommodations, decreased safety, and a lack of schooling options for their children, which left rural practice with a negative connotation^{6,12,38,74}. Push factors that were reported related to personal reasons were widespread, but included issues with management, high clinical demands, and a lack of support accessing clinical professional development^{24,38,43,57,61}. It is necessary for communities to track the ageing client population, as they will probably need greater healthcare services⁵⁷. With the subsequent increase in workload demands that place more stress on practitioners, it is important for administrative professionals to work preemptively to target recruitment, thereby mitigating risks of burnout and turnover^{43,53,65,75,77}. While the issues identified above are

important to address throughout the employment process, they are especially important to target in the first 12–18 months, as some literature found that most employees knew if they would be leaving a job within that time frame³⁵.

Based on the knowledge of these common push factors, there have been many strategies recommended at the systemic, organization, and individual levels. The systematic level focuses on broad-scale changes that would be beneficial for AHPs, such as decreasing bureaucracy that impedes practitioners in successfully opening or maintaining private practice clinics or reducing the processes that slow down the introduction of new practitioners into the workforce^{52,65}. One unique system-level practice model that was implemented in Australia was the public-private partnership model³⁵. This model was beneficial because it provided both the public and private sectors with greater supports for rural practitioners, and it overcame limitations that impede rural service delivery in a traditional model³⁸. Strategies that address the organizational level included contextual factors such as career advancement opportunities, retention incentives, and allowing flexible employment options to meet employee work-life needs^{2,12,18,65,75}. The individual-level supports addressed the person needs by establishing mentorship and support networks, promoting the key person factors of self-efficacy, autonomy, and diversity; and increasing access to continuing professional development^{5,12,18,19,22,23,37,39,48,53,58,61,67,71,78,79}.

Limitations

The findings of this study were limited by the set date range and the necessary restriction to English-only publications. Additionally, only snowballing hand searches were completed, despite the author identifying that citation mining hand searches would have been beneficial to broaden the research on person factors. The research questions limited the evidence that could be included, because articles that focused on service delivery and specific specialty services had to be excluded. Research findings may be skewed for certain AHP groups because there was more research related to professions such as physical therapy, occupational therapy, and social work, with less for other disciplines. Another limitation was that the emphasis on rural practice had to be clearly identified in order to be included in the scoping review, which may have inadvertently left out key research.

Future research

Research would benefit from further investigation of AHP demographics and more workforce trend predictions, with particular emphasis on examining the potential impact of practitioner life stage on attrition. While there is much research on specific recruitment and retention strategies, the evidence would be bolstered by the investigation into long-term outcomes of specific recruitment and retention strategies. Collaboration with state licensure boards would be a potential avenue for increased data collection in rural areas to provide specific and useful information to rural practitioners.

Conclusion

The evidence largely demonstrates that there is no clear road map of what leads a person to take up rural practice, but there are a multitude of common factors found among rural practitioners^{33,79}. These factors are important for students, practitioners, and hiring managers to be aware of when considering employment in rural

practice. Specific strategies used for recruitment and retention should be flexible and individualized to the needs and preferences of each practitioner. With continued staffing shortages in rural areas, it is important for practitioners and healthcare businesses to intentionally ensure that valuable time and resources are being used for training new staff appropriately, with the hope that it will lead to long-term employment.

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Conflicts of interest

The authors have no conflicts of interest to declare.

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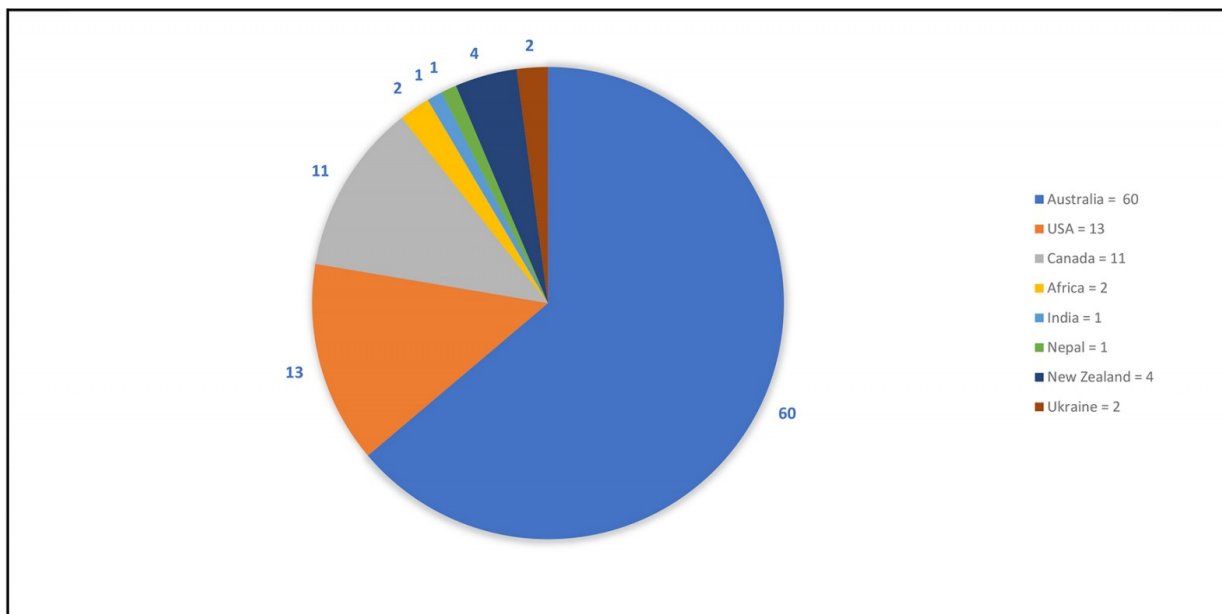
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Appendix I: Database specific search methods

Database	Search string	Filters used	Number of results
PubMed	((('Professional Practice Location'[Mesh]) OR ('Career Choice'[Mesh]) OR ('Workforce'[Mesh]) OR ('Personnel Loyalty'[Mesh]) OR ('Personnel Selection'[Mesh]) OR ('Job Satisfaction'[Mesh]) OR ('Allied Health Occupations/statistics and numerical data'[Mesh]) OR ('Attitude of Health Personnel'[Mesh]) OR access[Title/Abstract] OR retention[Title/Abstract] OR recruitment[Title/Abstract] OR workforce[Title/Abstract] OR precarity[Title/Abstract] OR capacity[Title/Abstract] OR ((career[Title/Abstract] OR job[Title/Abstract] OR employment[Title/Abstract]) AND (choice[Title/Abstract] OR preference[Title/Abstract] OR motivation[Title/Abstract] OR satisfaction[Title/Abstract]))) AND (('Occupational Therapists'[Mesh]) OR ('Physical Therapists [Mesh]) OR ('Allied Health Occupations'[Mesh]) OR 'ancillary healthcare'[Title/Abstract] OR 'allied health'[Title/Abstract] OR 'occupational therap*'[Title/Abstract] OR 'physical therap*'[Title/Abstract] OR 'speech language patholog*'[Title/Abstract] OR rehabilitation[Title/Abstract]) AND (rural[Title/Abstract] OR frontier[Title/Abstract] OR remote[Title/Abstract] OR ('Rural Population'[Mesh]) OR ('Rural Health Services'[Mesh])))	English language only	1379

Appendix II: Frequency of countries included in the literature



*Articles may include multiple countries.