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Understanding the practice patterns of nephrology nurse practitioners in Australia

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Abstract

Background: Nurse practitioners (NP) have an expanded scope of practice beyond that of a registered nurse. In kidney care, nephrology NP can manage patients at various points along the chronic kidney disease (CKD) trajectory.

Objectives: To profile the characteristics, service patterns, and domains of practice of nephrology NP in Australia.

Design: A cross-sectional online secure survey.

Participants: Nephrology NP (NP students) who were members of the Renal Society of Australasia and working in Australia (n = 73).

Measurements: Data collected were demographic and practice characteristics, and domains of practice (using the modified Strong Model of Advanced Practice). The survey also sought qualitative perspectives of the enablers and barriers to sustainability nurse practitioner healthcare delivery services.

Results: Nephrology NP (n = 45) primarily worked in adult services, managing those receiving haemodialysis, peritoneal dialysis, or patients with earlier grades of CKD. Providing direct comprehensive care was the dominant domain of advanced practice although administrative activities took up considerable time each week. Support from nurse leaders and medical colleagues was identified as key enablers for sustainability of these services whereas succession planning, and workload were the main barriers.

Conclusions: This study found a highly qualified, experienced but older nephrology nurse practitioner workforce who provide an additional model of health service delivery which can meet the growing CKD burden. Internationally, this level of nurse provides an opportunity for a career pathway to maintain nurses in direct clinical roles and to expand the nephrology nursing workforce.

KEYWORDS

advanced practice nursing, nephrology, nurse practitioner, renal

INTRODUCTION

Nurse practitioners (NP) are highly qualified, experienced registered nurses who have an expanded scope of practice beyond that of other nurses. According to the International Council of Nurses (ICN), a nurse practitioner is a type of advanced practice nurse who can undertake comprehensive health assessment, diagnose, and prepare treatment plans, and in some jurisdictions to prescribe medications and/or treatments (International Council of Nurses ICN, 2020). In many countries, NP hold a Master's level qualification as an entry to this level of practice (O'Connell et al., 2014). However, there is no globally accepted understanding of the role or educational and credentialing requirements for the role (Heale & Buckley, 2015). In Australia, the nurse practitioner title is protected by legislation, and can only to be used by a registered nurse who is endorsed to practice as the level by a registering authority (Nursing & Midwifery Board of Australia NMBA, 2020).

As of 2020, over 2251 NP have been endorsed in Australia to prescribe medications, make referrals, request diagnostic and pathology investigations, and are responsible for complete episodes of care (International Council of Nurses ICN, 2020; Nursing & Midwifery Board of Australia NMBA, 2021). They work in acute hospital departments (e.g., emergency, intensive care, medical, surgical wards), mental health, community and primary healthcare, and chronic condition management (e.g., diabetes, cardiology, nephrology) in both the public and private healthcare system (Bonner et al., 2019). The value of NP has been demonstrated in terms of satisfaction with care, reduced patient waiting times, and a willingness of patients to receive nurse practitioner care for management of both acute and chronic conditions (Coleman et al., 2017; Dwyer et al., 2021).

LITERATURE REVIEW

Specifically, in kidney care, nephrology nurse practitioners (NNP) have appeared in healthcare teams because of the increasing recognition of the rising global burden of chronic kidney disease (CKD) and the complexity of care required (McCrory et al., 2018; Wierdsma et al., 2016). In the Netherlands, NNP have existed for more than 10-years, and demonstrate improved health outcomes for people with CKD (Peeters et al., 2014). In primary healthcare, NNP are useful to support the care of First Nations people with CKD (Barrett et al., 2015) or other social disadvantaged groups. McCrory et al. (2018), in a systematic review, found that the inclusion of NNP in renal healthcare teams improves outcomes in blood pressure, glycaemic control, and cholesterol management for adults with CKD. In the United States, NNP are performing kidney biopsies (Nandwana et al., 2016) although these types of advanced procedures have not been reported by other countries.

In Australia, where 10% of the adult population have CKD and a further one in three are at risk of developing this disease (Australian Institute of Health and Welfare, 2020), NNP are a valuable healthcare workforce strategy for both the public and private healthcare systems. NNP practice in cities, regional centres and remote areas. Funding for healthcare in Australia is provided through the universal health scheme (Medicare Benefits Schedule [MBS]) with access to this scheme largely restricted to medical practitioners although dentists, some allied health professionals and NP can access the cost of delivering a limited range of healthcare activities ('charge' to the government to recover costs of providing the service; Fong et al., 2017). In addition, the Australian Government subsidises the cost of medications through the Pharmaceutical Benefits Scheme [PBS]). In 2010 the Australian government provided legislated privilege to endorsed NP which include prescribing medicines under the PBS.

Since 2003, NNP services have expanded in Australia for adults and children along the trajectory of CKD to slow the progression of the disease (in CKD grades 2–4) as well as when kidney failure is reached and kidney replacement therapy (KRT; haemodialysis [HD], peritoneal dialysis [PD] or kidney transplantation) or conservative care is required (Bonner et al., 2021).

Over the last 20 years, research into the role of NP has been gaining momentum. The Strong Model of Advanced Practice, originally developed by nurse researchers and clinicians at the Strong Memorial Hospital in the United States in the 1990s, has been used to identify the domains of practice of advanced practice nurses and to differentiate between types of advanced practice nurses such as clinical nurse specialists and nurse practitioners (Ackerman et al., 1996). In 2013, G. Gardner et al. (2013) using a modified version of this model, demonstrated that nurses with additional academic qualifications working in advanced practice roles performed at a higher level of practice. G. Gardner et al. (2016), in a national survey of Australian nurses also using the modified Strong Model of Advanced Practice, found that NP have different practice patterns to those of registered nurses, clinical nurse specialists, clinical nurse consultants and nurse educators. While A. Gardner et al. (2021) identified that specific standards for practice for NNP have been articulated, and recently updated (see Bonner et al., 2021), little is known about the practice profile and patterns of NNP in Australia.

MATERIALS AND METHODS

Aim

The aim of this study was to profile the characteristics, service patterns and domains of practice of NNP across Australia and to address the following questions:

- What is the extent and nature of NNP practice?
- Are the outcomes and impact of NNP practice being evaluated? And if so, how?
- What factors contribute to the sustainability of NNP services?

Participants and procedure

To reach the target national NNP population, Australian members of the Renal Society of Australasia (RSA) who are NP or currently enrolled in

nurse practitioner programmes, were purposively invited to participate via email. New Zealand members were excluded due to different registration and competency standards. The RSA is the peak nursing specialty association for Australia and New Zealand with ~2000 members. At the time of this study, there were 73 RSA members who were eligible for this study. To ensure there was no coercion of participants, recruitment was undertaken by a research team member external to the NNP network. Survey links were emailed to all eligible NNPs, but no identifying information was collected in the survey. The survey was also promoted via RSA online newsletters. To improve response rates, three follow-up and reminder emails were sent to eligible NNPs, along with repeated promotion of the survey by the RSA between October and December 2021.

Ethics

Human ethics approval was received from Griffith University . A link to a secure online survey hosted by Griffith university was provided to the RSA to distribute to its members via the RSA eBlast and through the RSA Nurse Practitioner Special Interest Group. An information sheet outlining the aim and purpose of the study was also distributed. When opening the online survey, participants were again provided with the information sheet and by clicking to the next page indicated consent to participate in the study. The anonymity and confidentiality of participants were preserved by not gathering identifying details during data collection and reporting of aggregating data.

Data collection

The Donabedian framework, which assesses the structures, processes, and outcomes necessary in the provision of quality healthcare (Donabedian, 2003) was used to study the NNP practice profile, and, with permission, a modified version the survey previously used by Douglas et al. (2018) to understand the practice profile of nurse-led clinics in Queensland, Australia. The survey was divided into five sections. The first section collected demographic characteristics to understand the age, gender, qualifications, length of nephrology nursing experience and workplace location. Section two collected information about the NNP service pattern to describe the way it was organised to deliver care such as the practice setting, purpose of the NNP service, how long the service had existed, demand for the service (i.e., waiting times for an appointment), referral patterns, prescribing medications, ordering of diagnostic investigations, and access to Australian Government funding for healthcare (i.e., MBS and PBS). NP can prescribe most medications via numerous routes of administration such as intravenous opioid analgesia or chemotherapy, although most NP prescribe medications based on their scope or specialty of practice. The third section gathered data about the NNP domains of advanced practice using the 41-item modified Strong Model of Advance Practice (G. Gardner et al., 2016). There are five practice domains: (i) direct comprehensive care, (ii) support of

systems, (iii) education, (iv) research, and (v) publication and professional leadership. Each item is scored on a 5-point Likert scale (0 = not at all, 1 = to a little extent, 2 = to some extent, 3 = to a great extent, and 4 = to a very great extent). The fourth section sought information about whether the outcomes of the service were evaluated, and if so, the types and frequency of data collected. The final section used open-ended questions to understand the enablers or barriers to the long-term sustainability of the NNP service. The online survey took ~10–20 min to complete.

Data analysis

Completed online survey responses were imported into SPSS Statistics version 27 for analysis (IBM Corp, 2020). Descriptive analysis to calculate percentages, medians and ranges for each question was undertaken. Only endorsed NNP data (i.e., those authorised by the NMBA to practice to the full scope of a nurse practitioner's practice) were included for analysis for the Strong Model of Advanced Practice items. Those not working as a NNP, or a student enroled in a nurse practitioner program were excluded as they are yet to practice to the full scope of a NP. For the open-ended questions, we used content analysis to group similar comments together (Lindgren et al., 2020).

RESULTS

Demographic characteristics

Forty-five NNP completed the survey (response rate 61.6%). The majority of NNP were aged >50 years (71.1%), female (88%), with a Master's level qualification (71.1%), and had greater than 20 years' experience in nephrology nursing (73.3%). Most participants reported being employed as a NNP (80%), there were some who were endorsed as a NNP but not yet employed (11.1%) and others who were enroled in a nurse practitioner programme (6.7%). Nearly one-third of participants (n = 12) had completed further formal qualifications such as diabetes education or palliative care, and two had completed PhD studies. Table 1 provides the demographic characteristics of participants.

Service profile

Table 2 describes the way the service was organised. NNP primarily worked in capital city located kidney services (53.3%), providing healthcare to adults (93.3%), for those receiving HD or peritoneal dialysis (37.8%) or for those with CKD grades 1−4 (33.3%). Five NNP were focused on providing conservative or supportive care. The mean length of time that the NNP service had been operational was 10.33 ± 3.1 years and each NNP provided care for a median of 20 patients per week. Some of the participants reported that the services where they were employed also had other nurses, allied health professionals, and some administrative staff.

TABLE 1 Nephrology nurse practitioner demographic characteristics

Variable	N (%)
Gender	
Female	40 (88.9%)
Male	5 (11.1%)
Indigenous status	
Neither Aboriginal or Torres Strait Islander	43 (95.6%)
Aboriginal	2 (4.4%)
Age	
30–39	2 (4.4%)
40–49	11 (24.4%)
50–59	22 (48.9%)
60–69	9 (20.0%)
Over 70	1 (2.2%)
Registered nurse experience (years)	
5–9	3 (6.7%)
10–14	1 (2.2%)
15–19	3 (6.7%)
20–24	5 (11.1%)
Over 25 years	33 (73.3%)
Nephrology nursing experience (years)	
5–9	5 (11.1%)
10–14	3 (6.7%)
15–19	4 (8.9%)
20–24	15 (33.3%)
Over 25 years	18 (40.0%)
Nephrology nursing qualifications	
Master's degree	32 (71.1%)
Graduate diploma	3 (6.7%)
Graduate certificate	4 (8.9%)
Certificate (hospital-based)	5 (11.1%)
None	1 (2.2%)
Nurse practitioner (NP) status	
NP and employed in an NP role	36 (80.0%)
NP and NOT employed in an NP role	4 (8.8%)
NP student (enroled in NP programme)	3 (6.7%)
NP retired	2 (4.4%)
Have you completed further formal qualifications to support or enhance the requirements of your scope of practice?	
Yes	13 (31.0%)
No	29 (69.0%)

TABLE 1 (Continued)

Variable	N (%)
If yes	
Graduate certificate	5 (41.5%)
Master's degree	4 (33.2%)
PhD or current candidate	2 (16.6%)
Vaccination certificate	2 (16.6%)
Other certificates	1 (8.3%)

TABLE 2 Service profile

Variable	N (%)
State or territory of work	
Queensland	13 (28.9%)
Victoria	12 (26.7%)
New South Wales/Australian Capital Territory	9 (20.0%)
South Australia/Northern Territory	6 (13.3%)
Western Australia	4 (8.9%)
Tasmania	1 (2.2%)
Location	
Capital city	24 (53.3%)
Other metro/regional >100,000 population	10 (22.2%)
Large rural centre 25–100,000 population	3 (6.7%)
Smaller rural centre 10–25,000 population	4 (8.9%)
Remote area 5–10,000 population	0 (0.0%)
Very remote <5000 population	4 (8.9%)
Patient population	
Adults	42 (93.3%)
Both adults and children	3 (6.7%)
Main area or focus of clinical practice	
Dialysis (either haemodialysis (HD) or peritoneal dialysis (PD))	17 (37.8%)
Chronic kidney disease (Grade 1–4)	15 (33.3%)
Conservative or supportive care	5 (11.1%)
Other (below)	5 (11.1%)
Transplantation	3 (6.7%)
Other	
Director of Health Services	1 (2.2%)
Generalist, chronic disease	1 (2.2%)
Not currently employed as nurse practitioner	1 (2.2%)
Renal access (HD and PD)	2 (4.4%)

TABLE 3 Patient service pattern

Variable	N (%)
On average, how long does a new patient wait to access the service?	
No waiting time	9 (36.0%)
Days	3 (12.0%)
Weeks	7 (28.0%)
Months	6 (24.0%)
On average, how long does a patient wait for follow-up appointment?	
No waiting time	10 (40.0%)
Days	2 (8.0%)
Weeks	8 (32.0%)
Months	5 (20.0%)
Patient attendance patterns are mostly	
Single visit only	4 (16.7%)
Drop-in centre	4 (16.7%)
Ongoing appointments	22 (91.7%)
Who refers patients to the service?	
Medical specialists	22 (91.7%)
Allied health professionals	8 (33.3%)
Community nursing service	5 (20.8%)
General practitioner	12 (50.0%)
Other nurse practitioners (NP)	12 (50.0%)
Patient self-referral	8 (33.3%)
Other health professional	8 (33.3%)
Who does the service refer patients to?	
Medical specialists	18 (75.0%)
Allied health professionals	18 (75.0%)
Community nursing service	16 (66.7%)
General practitioner	17 (70.8%)
Other NP	13 (54.2%)
Other health professional	7 (29.2%)
Other staff in your service	
Nurse practitioner	13 (28.6%)
Clinical nurse	7 (15.4%)
Clinical nurse consultant/nurse practitioner candidate	4 (8.8%)
Other registered nurse	9 (19.8%)
Administration officer	11 (24.4%)
Allied health	12 (26.7%)

Table 3 describes the patient service patterns. On average, 36% of participants reported no waiting time for patients to be able to access the service, and that patients tended to attend on an ongoing basis (91.7%). Medical specialists, allied health professionals, other nephrology nurses, and other NP were the main referrers of patients into the service. In some services, patients could self-refer to the NNP. Less than half NNP reported having access to MBS items (43.2%) although the majority were able to access PBS items (81.8%). Overall, 85.7% identified that their scope of practice allowed them to practice effectively with 86% of endorsed NNPs prescribed medication, requested diagnostic investigations (79.1%), and referring to other clinicians (83.7%; see Table 4).

Strong Model of advanced practice

The results for the five domains of advanced practice are presented in Table 5. Not surprisingly, most activities undertaken by NNP was to provide direct comprehensive care such as conducting history taking, physical assessment, formulating a plan of care, providing patient and caregiver education, and assessing response to treatment. This was followed by support of systems, education, research, and publication and professional leadership. Each week, more than 22 h was delivering direct comprehensive care. Participants in this study also identified a considerable amount of time was taken performing administrative (non-nursing) support of systems duties. Supporting Information: Table 1 provides further detail of the responses to the Strong Model of Advanced Practice.

Outcomes of NNP service delivery

Evaluating healthcare service delivery is important to improving the quality of patient care as well as providing evidence to sustain innovative models of care (see Table 6). Just over half the NNP participants reported having specific performance targets for their service (52.4%) and had evaluated their service in the last 12 months using audits (35.6%), annual reports (33.3%) or business cases (8.9%). Only three NNP used formal research methods to evaluate their service. Indicators measured were patient-reported outcomes (26.7%), clinical targets (24.4%), and service utilisation (22.2%). Evaluation was mostly used for local quality improvement, to monitor for patient outcomes, and to justify the service provided by NNP. Less than half of the participants (40%) knew how the service was funded.

Enablers and barriers of sustainability

The open-ended questions at the end of the survey sought qualitative comments about the enablers and barriers perceived by the NNP to

TABLE 4 Nephrology nurse practitioner practice profile

	Yes/yes, with no restrictions	Yes, with limitations	No
Can you access Medicare (MBS)	19 (43.2%)		25 (56.8%)
Can you access Medicare (PBS)	36 (81.8%)		8 (18.2%)
Are you able to prescribe medications?	13 (30.2%)	24 (55.8%)	6 (14.0%)
Are you able to request pathology diagnostics?	38 (88.4%)		5 (11.6%)
Are you able to request radiology diagnostics?	34 (79.1%)		9 (20.9%)
Are you able to make referrals?	12 (27.9%)	24 (55.8%)	7 (16.3%)
Scope of practice allows practice effectively as a NNP	36 (85.7%)		6 (14.3%)

Abbreviations: MBS, Medicare Benefits Schedule; NNP, nephrology nurse practitioners; PBS, Pharmaceutical Benefits Scheme.

TABLE 5 Strong Model of advanced practice domains

	Advanced practice activities[a] Mean (SD)	Work time in domains (h) Mean (SD)
Direct comprehensive care	3.02 (0.61)	22.89 (7.98)
Support of systems	1.88 (0.61)	5.94 (4.35)
Education	2.01 (0.69)	4.71 (3.67)
Research	1.89 (0.83)	3.12 (4.12)
Publication and professional leadership	1.68 (0.82)	2.18 (1.74)

Abbreviation: SD, standard deviation.
[a]Activities scored from 0 (not at all) to 4 (to a very great extent).

continuing the service although these questions did not generate many responses (18 participants gave brief responses; see Supporting Information: Table 2). There were three enabling factors. First 'being recognised as an important part of the system', which underpins the notion that recognition of the importance and contribution is a major driver for NNPs. Next 'acceptance and appreciation by other professionals' indicating that NNPs knew that other members of the multidisciplinary team as well as nurse leaders had explained to them that their role was necessary. The final enabler was 'demonstratable patient outcomes'. One participant for instance wrote that *the outcomes speak volumes, and the patients value the service which is a key factor*. The barriers for the service were: (i) 'sustainability of the service largely due to funding and succession planning', (ii) 'service not offered when NNP on leave', and (iii) 'NNP workload'. For example, one participant wrote *economic considerations are usually the driver for service planning and design —justification of our existence is ongoing*.

DISCUSSION

This study identified key features of the NNP practice profile. While NNP have extensive clinical experience working in this specialty, a large proportion of NNP were over 50 years of age which is a much older cohort of NP than other specialty NP in Australia (Currie et al., 2016). The potential loss of this senior experienced nursing

workforce due to impending retirement is problematic given the growing burden of CKD in the Australian population. In the United States, the largest issue seen in nephrology is recruiting and retaining NNP (J. Davis & Zuber, 2021). Strategies are also urgently needed in Australia to delay the retirement of this workforce while at the same time developing robust succession plans such as direct mentorship of registered nurses to build the capacity and experience of these nurses to undertake nurse practitioner Master's programmes.

This study also found that those NNP who responded to the survey were managing patients along the trajectory of CKD—from earlier grades where the focus is on slowing the progression to kidney failure, through to those receiving KRT or those requiring conservative care. For patients in kidney failure, these are often some of the most complex people to manage as they are known to have multiple comorbidities and complex treatment regimens including being prescribed between 5 and 15 daily medications (J. Davis & Zuber, 2021). These patients do require advanced and specialised knowledge provided by renal services (Levin et al., 2013) which this survey identified NNP provide.

Direct clinical care was the primary focus of activity by NNPs in this study. This finding supports the earlier study undertaken by G. Gardner et al. (2016) whereby direct clinical care consumed a majority of the employed hours of NP compared with those in other advanced practice roles. Coordination and collaboration of care activities was a high priority reflecting the scope of practice of the

TABLE 6 Nephrology nurse practitioner service outcomes

Variable	N (%)
Types of service evaluation performed in the last 12 months	
None	2 (9.1%)
Audit	16 (72.7%)
Business case	4 (18.2%)
Annual reporting	15 (68.2%)
Formal research	3 (13.6%)
Other	1 (4.5%)
Does the service have any specific performance targets or key performance indicators?	
No	10 (47.6%)
Yes	22 (52.4%)
Types of outcome data collected	
None	3 (13.6%)
Patient health outcomes/clinical targets	11 (50.0%)
Patient-reported outcomes (e.g., quality of life)	12 (54.5%)
Health service utilisation	10 (45.5%)
Costing	4 (18.2%)
Other	3 (13.6%)
Methods of data collection	
None	2 (9.1%)
Paper-based audit tool	11 (50.0%)
Patient charts	9 (40.9%)
Electronic healthcare record	15 (68.2%)
Other (database, REDcap, etc.,)	4 (18.2%)
Purpose of data collection	
Not applicable	2 (9.1%)
Monitor patient outcomes	13 (59.1%)
Justify health service	11 (50.0%)
Local quality improvement	14 (63.6%)
Research purposes	9 (40.9%)
How is the service funded?	
Do not know	23 (57.5%)
Activity based funding	1 (2.5%)
Government/MBS/public health	12 (30%)
Pharmaceutical	5 (5%)
Main renal budget	1 (2.5%)
Part of nephrology service, no extra funding	1 (2.5%)

Abbreviation: MBS, Medicare Benefits Schedule.

NNP who would frequently need to refer patients to other medical and healthcare practitioners as part of the multidisciplinary care needs of people with kidney failure. The ability of NNP to work in an integrated care arrangement ensures the provision of wholistic care and addresses the complex needs of this patient cohort (Heale et al., 2018).

The other domains of activity, namely support of systems, education, and research, were more likely to be undertaken than the activities dedicated to publication and professional leadership. These results differed slightly to the workforce survey undertaken by G. Gardner et al. (2016) where the NP identified greater focus on education over support of systems, and professional leadership over research. The variation in these results may be due to the NNP extensive experience which should lend itself to focusing on provisions of education to patients and family members as well as other nephrology nurses and medical students. In our results, we also found that workload was identified as a key barrier to role sustainability which may also impact the allocation of time to the various domains of activity. Of concern is the hours spent undertaking administrative duties which exceeds all the advanced practice domains except for direct comprehensive care. To mitigate being overwhelmed in providing care for these highly complex patients, some administrative time between each clinical consult is needed for review of pathology and other investigations independent of clinical consultations (Heale et al., 2018). However, appropriate administrative support is also needed for NNP, which ensures that a highly educated and well-paid workforce is maximised in providing direct patient care.

Evaluation of nurse practitioner models of service delivery is a necessity for the provision of quality healthcare. In this study population, nearly all NNP reported undertaking some form of patient evaluation over the last 12 months. Outcome data collected was reported as being related to clinical outcomes, patient-reported outcomes, and health service utilisation. This study did not capture the specific outcomes collected, although other international studies have reported that blood pressure and other clinical outcomes are well managed by NNP (McCrory et al., 2018; Wierdsma et al., 2016). Future research in Australia is needed to identify the impact of these nurses. Previous studies have identified high level of patient satisfaction and improvement in self-management when healthcare is provided by NNP (Bonner et al., 2020; Coleman et al., 2017).

An additional relevant finding from this study was that a large proportion of participants were not aware of how the service was funded. The lack of business acumen by NP has been reported elsewhere (Raftery et al., 2021), however business decision-making service cannot be ignored by NNP. It is crucial that NNP advocate in their departments for sustainable funding of this position as this will lead to greater acceptance of the contribution of the position to meeting value-based healthcare delivery for people with CKD, alignment of workload to patient numbers like other medical and

allied health professionals, and also support succession planning. The understanding of funding models and business decision making should also reduce the amount of time NNP spend advocating for their role (Smith et al., 2019).

Smith et al. (2019) examined the macro, meso, and micro enablers and barriers affecting rural NP, identifying that when they receive support from their medical, nursing, and allied health colleagues, NP are more effective. This enabler was also found in this study, and several NNP identified that they were more likely to be supported from medical colleagues rather than nursing leaders. Despite the potential contribution that NP can make to reforming healthcare service delivery, evidence suggests that this workforce is still meeting considerable barriers (Scanlon et al., 2016). This study found that barriers for NNP were due to workload (managing large numbers of patients), not being replaced when on leave (implying undervaluing the service provided) and having to justify the cost effectiveness of the service by frequently being asked to provide business cases and other evidence which is rarely required from other healthcare professionals.

LIMITATIONS

This study does have limitations. First, and although we recruited from the RSA, where most NNP are members, we could have also recruited from other professional nursing organisations. While this study used the survey developed by Douglas et al. (2018), we were unable to directly compare the results of our study with this one due to the different categories of nurses involved. Finally, the results of this study may not be generalisable to other countries where the NNP scope of practice could be different.

IMPLICATIONS FOR CLINICAL PRACTICE

The findings of this study will be of interest not only in countries which have similar advanced practice nephrology nurses who undertake similar functions but also in those countries looking to expand this level of nurse in the future. Our results indicate that NNPs are providing direct clinical care across the continuum of CKD. The benefit and importance of growing and nurturing a nurse practitioner (or advanced practice) workforce is clear, however an ageing workforce and a lack of succession planning is problematic for nursing leaders. The ageing kidney nursing workforce is a concern in many countries, and strategies to train and retain these highly qualified clinical experts as the 'bedside' are urgently needed. In addition, advanced practice positions such as the NNP are an opportunity to offer a career pathway to maintain kidney nurses in direct clinical roles and to expand the nursing workforce. Lastly, the complex and advanced level of care provided by NNPs, and the division of labour found in this study, highlights the need for further organizational and administrative support within renal services, to optimize the provision of this model of health service delivery.

CONCLUSION

This study identified that NNP spent most of their work hours providing high level clinical care. While there were several enablers, sustainability was of considerable concern for this specialised advanced nursing workforce. Improved understanding of business models may help with the establishment of the NNP to be core component of the nephrology workforce in the future.

AUTHOR CONTRIBUTIONS

Ann Bonner: Conceptualisation, methodology, formal analysis, writing–original draft. **Bettina Douglas**: Conceptualisation, methodology, writing–review & editing. **Leanne Brown**: Methodology, formal analysis, writing–original draft. **Barbra Harvie**: Conceptualisation, methodology, writing–review & editing. **Anthony Lucas**: Writing–review & editing. **Melinda Tomlins**: Writing–review & editing. **Kerri Gillespie**: Data curation, formal analysis, project administration, writing–review & editing.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICAL STATEMENT

The study was approved by Griffith University Research Ethics Committee (GU Ref No: 2021/593). The study conformed to the National Statement on Human Experimentation by the National Health and Medical Research Council, Australia. A secure online survey was used, and participants were provided with information about the study and by clicking to the next page indicated consent to participate in the study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.