Optimising the Role of Nurse Practitioners in New Zealand

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Attestation of Authorship

"I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgments), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning".

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List of Abbreviations

ACNP	Australian College of Nurse Practitioners
AMA	Australian Medical Association
CFA	Confirmatory Factor Analysis
DHB	District Health Board
ED	Emergency Department
GP	General Practitioner
JCQ	Job Content Questionnaire
JDCS	Job Demand Control Support
MCNZ	Medical Council of New Zealand
MoH	Manatū Hauora Ministry of Health
NCNZ	Nursing Council of New Zealand
NP	Nurse Practitioner
NPNZ	Nurse Practitioners New Zealand
NPTP	Nurse Practitioner Training Programme
PCC	Person-Centred Care
PHC	Primary Healthcare
PHO	Primary Healthcare Organisation
WHO	World Health Organization

Abstract

Background

Nurse Practitioners in New Zealand are highly skilled Registered Nurses with the qualifications to work independently, make autonomous decisions, and are authorised prescribers. However, despite the existence of the role for over 20 years, it has not fully realised its potential. Consequently, Nurse Practitioners have faced challenges in receiving organisational support, hindering their ability to achieve their maximum economic and clinical impact. Key challenges facing New Zealand's health system include establishing sustainable models of care for individuals with long-term and complex health needs, addressing workforce shortages, and managing the repercussions of the COVID-19 pandemic. Therefore, it is time to develop new models of care and integrated inter-disciplinary primary healthcare teams, including Nurse Practitioners, to improve the coordination and provision of healthcare to the public. The development of new models of care will require an in-depth understanding of how Nurse Practitioners perform their role.

Aim

This research aims to identify the organisational opportunities for Nurse Practitioners to make decisions about the means and methods of performing their role.

Methods

A cross-sectional study was conducted. The study investigated the decision-making opportunities available to Nurse Practitioners, examining the potential influence of geographical location on their practice. The measurement tool utilised was the validated Job Content Questionnaire, and the Nurse Practitioners were requested to complete a 68-item self-administered online questionnaire. A convenience sample (n=169) represented 49% of the Nurse Practitioner workforce. The Job Content Questionnaire was assessed for reliability and construct validity using the co-efficient α and confirmatory factor analysis, respectively. Linear regression analyses were performed to determine the strength of the relationships between constructs measured by the Job Content Questionnaire.

Results

The study findings revealed that Nurse Practitioners perceive themselves as having more control over their decision-making when supported by their colleagues rather than supervisors. Nurse Practitioners perceive improved relationships with healthcare consumers if they feel an increase in support from their colleagues, which is mediated through the increased freedom they perceive themselves to have to make decisions about their practice. The study also found that when rural Nurse Practitioners had an increased perception of being valued and appreciated at work, they felt more secure in their jobs.

Discussion and Conclusions

These findings have implications for New Zealand's healthcare policies, emphasising the importance of supporting Nurse Practitioners so that they can practice to the fullest extent of

their capabilities and contribute to reducing healthcare access disparities within the population. Explicit inclusion of the Nurse Practitioner role in the workforce policies is necessary. The study recommends implementing a funded vocational training programme for novice Nurse Practitioners, potentially enhancing Nurse Practitioner-led practice growth in New Zealand.

Chapter One: Introduction

Introduction

The nursing profession serves as the foundation of healthcare systems worldwide. In New Zealand (NZ), Nurse Practitioners (NPs), in particular, fulfil a unique and important role within the healthcare system. NPs possess advanced clinical training, comprehensive scopes of practice, and the authority to manage patient care independently. This research aims to identify whether NPs in New Zealand, practising across diverse settings and geographical locations, have the organisational opportunities to make decisions related to practice, management, and provision of patient care. Despite the development and the establishment of the role of NPs in NZ in 2002, the growth of this workforce has been relatively slow, particularly in the first 13 years (Nursing Council of New Zealand, 2023).

Nurse Practitioners have advanced skills, including a master's degree and prescriptive authority. Nurse Practitioners practice within various healthcare contexts, from primary healthcare (PHC) to hospitals, non-government organisations, Māori or iwi providers, long-term care homes, and rural communities (Ministry of Health, 2022d). Some NPs even own and manage their general practices supported by government funding and subsidies. However, the NP role has not achieved its full potential despite its existence for over 20 years and its healthcare need.

The development of the NP role in NZ, as envisioned by the government under the *Primary Health Care (PHC) Strategy* in 2001, was to enhance healthcare access and address the inadequate health outcomes faced by the Indigenous Māori population and other marginalised communities. The *PHC Strategy* implemented population-based funding to expand nursing roles in PHC. However, NPs have encountered various challenges, ranging from a lack of recognition and understanding of their role among colleagues and managers to insufficient funding, the prevalence of biomedical models of care, and tensions among healthcare professionals (Adams, Mustafa, et al., 2022). In a healthcare setting still predominantly led by physicians, PHC in NZ has been criticised for its limited ability to switch focus from treating diseases to promoting wellness (Health and Disability System Review, 2020).

The changing healthcare context within NZ presents a vital reason to continue exploring the NP role and its potential. The increasing ageing population, the prevalence of long-term health conditions, and health workforce shortages have contributed to this changing healthcare context. Long-term conditions (e.g., diabetes, chronic respiratory diseases, heart disease, and mental health disorders) are characterised by ongoing and recurring conditions and significantly impact a person's life. This makes it important to look beyond conventional medical care (Ministry of Health, 2022b). Nurse Practitioners possessing a holistic approach, specialised knowledge, and patient-centred care delivery have become essential assets in treating these conditions (Bonner et al., 2020; Ploeg et al., 2013; Pond et al., 2021).

The unique skill set of NPs and their advanced clinical training enable them to diagnose, treat, and manage a range of health conditions. Moreover, their focus on health education, promotion, and disease prevention empowers them to address the complex needs of patients with long-term conditions. Through ongoing care provision, symptom monitoring, referrals, and collaboration with other health professionals, NPs offer comprehensive support to patients, thus alleviating the burden on PHC medical practitioners (Adams & Carryer, 2019; Carryer & Adams, 2017; Carryer & Yarwood, 2015). International research consistently demonstrates the safety and effectiveness of NPs in meeting the healthcare needs of these populations while improving access to health services (Bonner et al., 2020; Carryer & Adams, 2017; Currie et al., 2022; Gagan et al., 2014; Harvey, 2015; Jennings et al., 2015; Pirret, 2008; Sangster-Gormley et al., 2013; Wand et al., 2011b). Yet, despite these findings, NPs continue to struggle with a lack of organisational support.

Additionally, NPs are pivotal in improving access to healthcare services, especially for marginalised and rural populations (Kooienga & Carryer, 2015; Xue & Intrator, 2016; Yasin et al., 2020). Globally, many countries face challenges related to limited rural resources, including a shortage of primary care medical practitioners (Sabety et al., 2021). This shortage creates barriers to timely access to appropriate healthcare, leading to health disparities and diminished health outcomes for these communities. Nurse Practitioners, with their unique skill set, are well-positioned to bridge the healthcare access gap (Carryer & Adams, 2017).

As New Zealand's healthcare system evolves to prioritise person-centred and integrated care while implementing new care models (Ministry of Health, 2016b), NPs can play a crucial role within these new collaborative care models. However, to fulfil this potential, they require comprehensive support from interprofessional healthcare teams to establish and maintain their roles and job satisfaction (Forbes et al., 2018). To realise the full potential of the NP workforce in NZ, it is essential to understand their functioning and the professional support they require.

This research emerges from a decade-long personal journey as an NP, specifically in residential aged care and PHC. Throughout my journey as an NP, I have experienced challenges and triumphs in this role, from a novice NP establishing a new professional role identity to an experienced NP mentoring aspiring candidates. The need to clarify the NP role has become a daily discourse, whether with patients or other healthcare professionals. Observing collaborative practice and collegial support among NPs fuelled my curiosity about their psychosocial work environment. Conducting original research as part of my professional doctorate, with the potential to enhance the future role of NPs in NZ, has been the driving force behind my persistence.

Chapter One follows this introduction, providing an in-depth exploration of the NZ healthcare system's structure and historical aspects, the prevalence of long-term conditions, and health inequity. The chapter will trace the journey of NPs in NZ, highlighting the significance of

the person-centred model of care and the critical need for NP role support. It will conclude by articulating the study's aim, research questions, and an outline of the thesis structure.

Background

Historical Overview of the Healthcare System in New Zealand

This chapter delves into New Zealand's healthcare system to provide the context in which NPs practice. The chapter will offer a historical overview of the system and provide insights into its structure, organisation, and key stakeholders. This exploration will help to understand better the challenges and opportunities NPs face in their roles. Understanding this background is crucial to appreciate the unique circumstances and dynamics that shape the NP practice in NZ. It is important to note that the healthcare system is undergoing reforms as of the time of writing. The overview presented here relates to the critical historical reforms and the early stages of the latest health system restructure.

New Zealand's healthcare system serves a population of 5.2 million, as reported by Statistics New Zealand (2022). It is primarily funded through public sources and offers universal coverage. The Manatū Hauora (Ministry of Health) governs NZ's health system and is the central government's lead advisor to the Minister of Health. The Manatū Hauora plays a crucial role in policy formulation, development, and overall healthcare system management nationwide. Its responsibilities include providing guidance, leadership, and regulations to ensure the delivery of safe and high-quality health and disability services to the NZ population. Healthcare and disability services in NZ are delivered by a combination of public, private, and voluntary non-governmental organisations. Te Whatu Ora (Health New Zealand) oversees and operates all public hospitals and public health services, which are provided free of charge. However, a service fee is required when consulting with a doctor in community-based general practice (Ministry of Health, 2023).

The foundations of New Zealand's public health system can be traced back to the *Social Security Act* of 1938, which aimed to establish a national health service similar to that of the United Kingdom. The ambitious vision was to ensure universal access to an integrated healthcare service, eliminating barriers to care based on income or location. This included bringing all healthcare professionals under the government and state employment. However, the government's goal of full integration was not fully realised, as negotiation with the medical professional association resulted in the retention of private practices for medical practitioners. As a result, 40% of hospital specialists maintain parallel private practices (Goodyear-Smith & Ashton, 2019). Regular reviews of the health system, as highlighted by Cumming (2022), have identified the need for a stronger focus on preventative care and equitable access to primary healthcare (PHC). The fragmented nature of health services across multiple healthcare organisations, diverse health professionals, and user charges has increased health inequities and limited access to healthcare services. Consequently, between 1980 and 2020, the health system

underwent seven significant reforms, accompanied by changes in funding and planning systems, resulting in a divide between policymakers, managers, and healthcare professionals (Gauld, 2016).

In 1984, following the global economic crisis and the election of the Labour Government, NZ underwent significant changes in its health sector. During this period, 14 Area Health Boards (AHBs) were established to oversee public hospitals and public health services. However, hospital-based services and PHC developed independently of each other. Most primary health practices, solo or in group settings, were owned by GPs who received government subsidies and patient co-payments (Goodyear-Smith & Ashton, 2019). These payment systems have created barriers to access for a significant portion of the population, which persist to this day. These barriers have disproportionately affected Māori, Pacific, and socioeconomically deprived populations, contributing to health inequities (Gauld, 2016). Market-oriented health reforms were introduced in 1993, which led to the abolition of AHBs and the implementation of a funder and provider split. Four Regional Health Authorities were designated funders, while 23 Crown Health Enterprises became the providers. Unfortunately, these reforms also did not achieve their intended financial targets and negatively impacted public health services resulting in limited access to elective hospital procedures (Adams & Carryer, 2021; Nicholls et al., 2020).

The reform of the primary health system began in NZ in 2000 with the introduction of the *New Zealand Health Strategy* and the *New Zealand Health & Disability Strategy*. These strategies outlined the principles, goals, and objectives to improve health equality and overall health status (Ministry of Health, 2000, 2001). As part of the reform, 21 DHBs were established to plan and fund healthcare services for their respective populations. The government acted as the primary funder, distributing funding through the Ministry of Health to the DHBs. Funding allocation to the DHBs was based on a population formula representing need. This funding covered public hospitals, various community-based services, and Primary Health Organisations (PHOs), which, in turn, subsidised GP services. Historically, approximately 80% of the total health expenditure was allocated to public hospital services. In comparison, the remaining 20% was privately funded through patient co-payments for GP visits, prescribed medicines, and private hospital and outpatient specialist services. Private hospitals and specialists primarily provided non-urgent services, with public hospitals predominantly handling trauma care. DHBs were incentivised to focus on community-based services over inpatient care in public hospitals (Gauld et al., 2019; Nicholls et al., 2020).

The reforms continued with the introduction of the *Primary Healthcare (PHC) Strategy* in 2001, which aimed to enhance the role of PHC within the healthcare system, becoming relevant for developing NP practice. This strategy recognised the importance of PHC in achieving better health outcomes and improving access to health services. As part of the strategy, not-for-profit PHOs were established to strengthen the PHC sector and facilitate the

delivery of services to local communities. The primary objectives of the strategy were to address and eliminate health inequities, ensure access to quality healthcare for improving, maintaining, and restoring people's health, coordinate care across different service areas, promote continuous quality improvement through reliable information, and develop the PHC workforce (King, 2001). The *PHC strategy* emphasised the development of the nursing workforce, recognising its critical role in implementing the strategy's goals. King (2001) argued for the establishment of career frameworks and employment arrangements to support the advancement of nursing practice, a development that set-in motion advanced nursing practice and the registration of the first NP in NZ in the same year (Adams & Carryer, 2021). The vision of the *PHC Strategy* for NPs was to address health inequities and improve access to healthcare services, particularly for Indigenous Māori and marginalised communities (Adams, Mustafa, et al., 2022).

The PHC reforms led to the establishment of over 80 PHOs by 2008. However, concerns were raised regarding PHOs' precise role, funding distribution, the extent to which a population-based approach to service delivery was implemented, and the lack of progress in transforming care models. In 2013, the alignment of roles between DHBs and PHOs was achieved by establishing alliances, enabling joint planning and shared accountability among DHBs, PHOs, and allied health providers to achieve common goals. Subsequently, in 2015, voluntary amalgamations reduced the number of PHOs to 32, often aligning their boundaries with those of DHBs. This facilitated coordinated service delivery planning and resource allocation to priority geographical areas (Cumming, 2016).

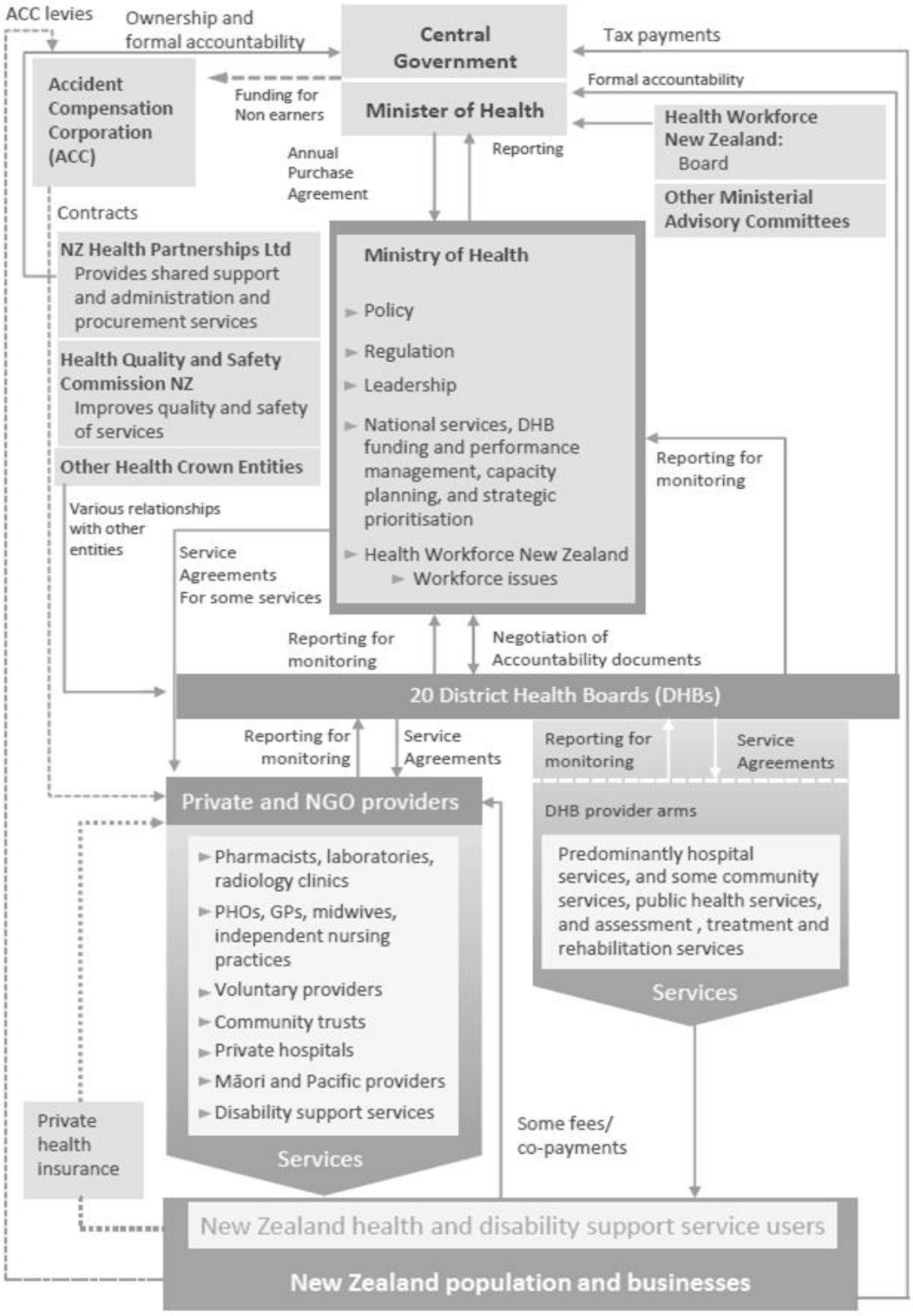
The commissioning health model, which has been in place for 20 years, has brought about greater stability and improvements in the delivery of PHC services. It has also enhanced accountability for achieving critical outcomes, such as immunisation and screening rates. PHC services were funded based on the number of enrolled patients, utilising a capitation basis. However, despite these improvements, user chargers for accessing PHC contributed to health inequities among Māori, Pacific, and lower-income New Zealanders. The needs of these populations are often underfunded, and the integration of care is not adequately implemented (Ministry of Health, 2015a, 2015b). The contradicting environment in the PHC sector, driven by competition, resulted in a lack of care integration. The growth of the NP workforce in the first 13 years since its establishment was slow due to government policies supporting privately owned physician-led general practice and health system reforms (Adams & Carryer, 2021).

Although the NZ health system has been regarded as efficient with reasonable expenditure levels, there was a growing expectation to steer the system in a new direction due to the shifting demographics, population ageing, and an increase in long-term conditions as discussed by Gauld (2016). According to Friedman et al. (2014), delivering high-quality and safe care relies on effective collaboration among health professionals. However, this posed a challenge in NZ, particularly in the medical field, where professionals are traditionally trained

to work as individual practitioners. The *New Zealand Health Strategy* (2016) recognises the centrality of teamwork in future healthcare delivery, but the policy's intent remains unclear. In practice, limited or no support existed for developing team-based service delivery and training approaches. Universities and professional educators were encouraged to emphasise teamwork from the beginning of training (Gauld, 2016; Gauld et al., 2019; Ministry of Health, 2016b).

In *New Zealand's Health Strategy* (2016), the primary objective was to establish a people-powered healthcare system where patients actively engaged in their health needs, had access to information, made choices in collaboration with healthcare professionals, and comprehended health information. Navigating the complex healthcare system, as depicted in Figure 1, could be challenging, particularly for patients with chronic conditions requiring multiple providers (Gunasekara et al., 2013).

Figure 1 *The Structure of the Health System in New Zealand from 2000 to Mid-2022*



Note. Sourced from the Ministry of Health (2021).

To develop new service delivery models, particularly in community health practice, nurses must understand health policy and actively participate in its development, as emphasised by Judd and Keleher (2013). Throughout the COVID-19 pandemic, nurses have received unprecedented media exposure globally, often depicted as heroes on the front lines. Despite this heightened visibility, nursing had a lower profile than other healthcare professions during the pandemic, with nursing concerns not always adequately acknowledged and addressed (Manning & Krieble, 2020). According to Daly et al. (2020), the increased global recognition of nurses during the COVID-19 pandemic has created opportunities for nurses to lead reforms and assume influential roles in shaping national healthcare policies.

Figure 1 depicts the intricate nature of the NZ health system that was in place for 22 years until July 2022. Under this system, the Manatū Hauora (Ministry of Health) funded the 20 DHBs, enabling them to plan, provide and deliver health and disability services within their respective regions. The DHBs owned and managed 82 public hospitals and provided public health and community health services. Patients could fund their care in private hospitals through private health insurance or out-of-pocket expenses. Meanwhile, DHBs allocated funds to PHOs based on a capitation formula to facilitate the delivery of health services in PHC settings via service agreements. This system also involved patient co-payments (Goodyear-Smith & Ashton, 2019).

District Health Boards had a dual role as providers of hospital services, planners and funders of PHC services. Consequently, hospital services were prioritised, and the system faced challenges regarding accessibility and the equitable delivery of health outcomes for all populations. Nurse Practitioners struggled to establish practice locally due to a lack of a national framework and PHC general practice business model. Primary healthcare physicians had control over the development of the nursing workforce due to their ownership of the general practice (Adams & Carryer, 2021). Barriers to developing successful NP-led PHC practice, as outlined by Carryer and Yarwood (2015), included society's belief in the power of biomedicine and nursing's acceptance of this faith prevented the development of innovative practice. At a systems level, traditional ideas that all healthcare provision must be overseen by medicine continue to be upheld and protected by medical lobbyists. Primary healthcare NPs continued to fill the gaps created by the lack of medical practitioners and had the opportunity to develop new and innovative models of care.

The Health and Disability System Review (2020) emphasised that NZ's traditional healthcare approach is unsustainable. It recommended a culture change, effective leadership at all levels, and a shift in mindset towards addressing health inequities and understanding the unique needs of individuals, whānau (extended family), and communities. Planning and funding should be driven by the specific needs of each community rather than solely focusing on population numbers (Health and Disability System Review, 2020). Nurse Practitioners are well-positioned to contribute to the proposed needs-based, patient-centred model of care outlined in

the review. Evidence suggests this model can improve the population's outcomes, particularly among deprived and underserved groups (Kirkman et al., 2018).

In April 2021, the NZ Labour Government announced the latest health system reform in response to the Health and Disability System Review. As part of the reform, the Manatū Hauora continues to govern health policy development, and a new unit called the Public Health Agency has been established to strengthen public health initiatives. The *Pae Ora (Healthy Futures) Act* was enacted on July 1, 2022, and introduced four new entities: a new Public Health Agency, Te Whatu Ora - Health New Zealand (a national organisation to lead and coordinate health service delivery), Te Aka Whai Ora - Māori Health Authority, (an independent statutory authority focused on improving Hauora Māori (Māori health)), and Whaikaha- Ministry of Disabled People, (tasked with providing a government-wide perspective on disability and driving transformation in the disability support system). The twenty DHBs have been disestablished, and Health New Zealand now operates all the hospitals and public health services (Ministry of Health, 2022a). The establishment of Te Aka Whai Ora- Māori Health Authority aims to lead the strategic direction and funding for Māori health services, addressing health inequities in NZ. Under the current health system reforms, there has been a shift from PHOs towards a focus on locality networks (Cumming, 2022). These locality networks aim to enhance PHC services and present potential opportunities for NP-led practices.

Current challenges faced by the NZ health system include effectively addressing the impact of the global COVID-19 pandemic, as highlighted by Dowell et al. (2022). The primary healthcare sector must develop sustainable models to meet the population's needs with long-term and complex health conditions. Addressing the higher morbidity rates observed in marginalised and deprived communities due to the prevalence of long-term conditions is crucial. To improve access to PHC, the health system reform should prioritise solutions such as health workforce retention, sustainability and promoting innovative practices (Dowell et al., 2022).

The most recent health system reform in NZ commenced on July 1, 2022, with the release of an interim *Government Policy Statement on Health* (iGPS) for the transition period of 2022-2024. The reform centres around the well-being of health consumers, improving outcomes, and delivering services that cater to the population's needs, specifically focusing on achieving equitable results for Māori and Pacific Peoples and disabled communities (Ministry of Health, 2022c). Healthcare is a complex social system, as described by Stolarek et al. (2022), involving various stakeholders, including healthcare consumers, health professionals, organisations, regulators, ministers, and others. These stakeholders engage in numerous interactions that shape the system through learning and adaptation. A well-functioning health system requires effective leadership and governance, fostering innovation and a unique approach to addressing health challenges while striving for equitable outcomes. Supporting leaders and clinicians by providing learning opportunities and equipping them with the necessary skills to fulfil their roles within the evolving healthcare system is essential (Stolarek

et al., 2022). Nurse Practitioners need to be central figures in the healthcare system reform in NZ. In a time where collaboration, efficiency, and responsiveness are most important, NPs, with their unique combination of advanced clinical skills, are well-positioned to provide leadership and clinical expertise to support the ongoing changes to reform of the NZ health system (Adams, Mustafa, et al., 2022; Carryer & Adams, 2017; Carryer & Yarwood, 2015).

Caring for the Future: Nurse Practitioners and Long-Term Conditions

Long-term conditions, as defined by the Ministry of Health (2022b), are persistent conditions that have a significant impact on people's lives. The distribution of long-term conditions varies throughout the population in NZ, affecting ethnic groups and age groups inconsistently. The likelihood of developing a long-term condition increases with age (Ministry of Health, 2022b). The prevalence of long-term conditions in NZ has increased by 62% from 1981 to 2013 due to the increasing life expectancy of older people, particularly those aged 65 years and over. The elderly population is highly prone to long-term conditions, with 72% experiencing at least one long-term condition, 42% experiencing two or more, and 18% experiencing three or more such conditions. As the older adult population is predicted to increase by 84% in 2026, approximately 20,000 more individuals will require long-term care (Ministry of Health, 2015a, 2016a; Statistics New Zealand, 2015).

The Health and Independence Report 2021 identified four leading condition groups in NZ, contributing to 83.5% of all health-related debilitation. These conditions include cancers (18.5%), cardiovascular and cerebrovascular diseases (15.1%), mental distress (8.7%), and musculoskeletal disorders (8.6%) (Ministry of Health, 2022b). Managing individuals with multiple long-term conditions necessitates a person-centred (PCC) and integrated care approach (Raco et al., 2019). This approach, centred around the patient, aspires to offer holistic care by comprehending the individual and their family, transcending the confines of treating a specific disease (Raco et al., 2019; Riste et al., 2018). The successful implementation of PCC requires aligning political, regulatory, organisational, and professional support. Person-centred care is an approach to improving the quality of care by ensuring that health services are accessible and well-coordinated around people's needs (Amelung et al., 2017).

In response to the evolving healthcare landscape, the Manatū Hauora has called for innovative disruption in traditional medical service delivery models over the years (Christensen et al., 2015; Ministry of Health, 2017). Opitz and Hebert (2018, p. 192) define innovative disruption as technologies, processes, or business models that provide the market with products or services that are more affordable and simpler to use than those currently available. The themes included health disparities, improvement of preventative care, increasing the entire workforce to practice at the top of their professional scope, and PCC integrated care of long-term conditions. Despite the Manatū Hauora's call for innovative disruption, Carryer and Adams argued in 2020 that there was no evidence of any significant change or disruption to healthcare delivery.

Nurse Practitioners have the disruptive potential to provide substitute sources of PHC (Christensen et al., 2009) and make significant strides in palliative medicine, providing more patients with high-quality care at the end of life (Opitz & Hebert, 2018). Gagan and Maybee (2011) demonstrated that advanced practice nurses (including NPs) provide safe and effective PHC comparable to medical practitioner care, usually due to the longer consultations and more comprehensive patient education. This included higher levels of patient satisfaction (Gagan & Maybee, 2011; Swan et al., 2015). However, despite a shortage of rural and PHC medical practitioners in NZ, the government's focus remains predominantly on recruiting and retaining medical practitioners rather than fully utilising the transformative potential of NPs (Adams & Carryer, 2019).

The Health and Disability System Review (HDSR) was tasked with reviewing the health sector, prioritising prevention, accessibility, sustainability, and equity. A significant flaw in the current health system is the absence of structured planning, resulting in professional silos and biomedical models of care that fall short of meeting the future healthcare needs of New Zealanders. HDSR's recommendations emphasise the need for a different workforce approach, emphasising interprofessional practice and improved cultural diversity. The health workforce development and changing the models of care with community engagement were identified as key recommendations in the HDSR final report (Health and Disability System Review, 2020).

New Zealand's healthcare system provides free hospital care for the population. Still, PHC and long-term aged residential care are operated under a private business model, with partial funding from the government and patients. In theory, people should have some level of access to health services. However, as highlighted by the Ministry of Health (2016b), the healthcare system falls short of delivering equitable access to health services for the entire population. Nurse Practitioners are ideally positioned to dismantle the silos of treatment and address the evolving healthcare needs of New Zealanders through innovative PCC models of care (Bonner et al., 2020; Carryer & Adams, 2017; Carryer et al., 2011). They hold the potential to rectify healthcare access inequities in New Zealand, making them instrumental in shaping the future of healthcare deliveries in the country.

Health Inequities in New Zealand's Historical Context

International research has demonstrated that Indigenous People suffer health inequities compared to the dominant colonising cultures (McIntosh et al., 2021). Māori are the Indigenous Peoples of NZ and have resided for approximately 1000 years. Te Tiriti o Waitangi (Treaty of Waitangi), a treaty between the Māori and the British Crown, was established in 1840 and affirmed Māori sovereignty and guaranteed health protection (Came et al., 2020). Henceforth, NZ has changed from a predominantly Māori population and culture to one dominated by Pākehā/European cultural traditions. According to Statistics New Zealand (2021), the population is mainly of NZ European ethnicity (70.2%), with Māori (16.5%), Asian (15.1%),

and Pacific Island (8.1%) populations. In a bicultural NZ, the colonised Māori Peoples bear the most significant burden of health inequities (McIntosh et al., 2021).

Some of the healthcare system disparities, such as affordability, use of care and quality of healthcare, are due to unequal access to health services by the population living in deprived urban and remote rural areas. This inequity includes poor response to Māori and Pacific People's needs, most at risk and open to early mortality (Ministry of Health, 2019). Māori health inequities originate from several factors, including the trauma of colonisation, loss of land, racism, and discrimination, according to the Waitangi Tribunal (2023). Other contributing factors include low socioeconomic status and inequities in the use of health services and quality of care. This low health literacy relates to higher rates of poor health outcomes, including long-term conditions, cancers, oral health, smoking prevalence, obesity, alcohol and drug use, suicide rates, and family violence (Ministry of Health, 2015a).

Māori Peoples have poorer health outcomes than the Pākehā/European population. According to the Tatau Kahukura, Māori Health Chart Book (2015), when comparing Māori to non-Māori populations, the following differences in mortality were identified: heart failure (>2 times higher), rheumatic heart disease (>5 times higher), chronic obstructive pulmonary disease (>3 times higher) and type 2 diabetes which is about 50% higher. The mortality rates were twice as high as those among non-Māori in 2010-2012. Māori adults aged 65 years and over and living with a disability were more likely not to access a consultation with a health professional when needed (7.5% of the population) than non-Māori disabled adults (4.8%) in the same age group (Ministry of Health, 2015b).

According to Brown and Bryder (2023), the lack of support for Māori initiatives and the increasingly residual nature of the health system, including user-pay fees for primary health services, have disadvantaged the Māori population in NZ. The introduction of the universal health system in 1938 by the first Labour Government supported social and economic equality for the Māori. However, equality of access did not mean equality of health outcomes, and the system was designed for Pākehā/European New Zealanders (McIntosh et al., 2021).

During the Second World War, many Māori moved to urban areas due to poverty and a lack of jobs in rural regions. By the 1970s, almost 80% of Māori lived in urban settings because of the economic downturn that affected the population on the lower socioeconomic scale. During this time, the fee-for-service was established for GP consultation in primary care, and the government subsidy was eroded by inflation over time. General Practitioners controlled access to specialist medical services; therefore, those who could not afford the GP visit would also be excluded from accessing specialist medical services, except through accident and emergency departments. In the 1960s, the newly implemented private health insurance was mostly unaffordable for Māori, who were more likely to live in low-income households. The health system's ignorance of the specific needs of Māori Peoples has contributed to the population's high mortality and morbidity rates (Brown & Bryder, 2023).

Many Māori health developments were established during this era by the fourth Labour Government, including the National Council of Māori Nurses and Māori-led health programmes. During this decade, several health system reforms created challenges for building organisational partnerships and a lack of consistent policy developed for Māori health providers (Blakely et al., 2005). In 1992, there was a non-government-initiated change in health by implementing cultural safety requirements for all nursing and midwifery students by the Nursing Council of New Zealand (NCNZ). The concept of cultural safety was initiated due to the poor health status of Māori, prompted by Māori nurses to establish a change in service delivery. The training required nurses to reflect on their cultural identity and how this affected their clinical practice to provide more individualised care to a person or family with another ethnicity. However, this cultural safety requirement created a public debate, intensified by media scrutiny, which questioned the standard of nursing education (Papps & Ramsden, 1996).

Concurrently, under the *Treaty of Waitangi Act,* the Waitangi Tribunal was established in 1975 to research and influence reconciliation between Māori and the Crown (Came et al., 2020). To address the extensive array of issues and over 200 breach claims, the Tribunal divided its proceedings into three parts. The first part, published in 2019, focuses on the primary healthcare system since 2000, the second covers Māori health (mental health, disability, and substance abuse), and the third will consider historical claims or other areas of significance. The first report published in 2019 (WAI 2575) confirmed Māori health inequities in the first two decades of the 21st century and that the primary health system has failed to achieve equitable Māori health outcomes. It identified that Māori health organisations were underfunded, the government failed to collect sufficient Māori health data to remain fully informed, and the Crown did not work with Māori. The report identified that Māori were underrepresented across health professions and at the Manatū Hauora (Waitangi Tribunal, 2023). The findings from the Waitangi Tribunal report influenced the current health system reforms, which include a Māori Health Authority under the *Pae Ora (Healthy Futures) Act;* however, this remains uncertain with the pending government elections in 2023 (Brown & Bryder, 2023).

Despite NZ being a bicultural society based on the Treaty of Waitangi principles, which have been incorporated into health policy since the 1980s, inequities between Māori and non-Māori exist in the form of institutional racism (Came, 2014). Institutional racism is defined by Came et al. (2019) as:

"a pattern of differential access to material resources, cultural capital, social legitimation, and political power that disadvantages one group while advantaging another" (p.62).

A change in health policy and practice interventions, as well as alternative and culturally appropriate models of care, can effectively meet the needs of Māori (Came, 2014; Sheridan et al., 2011). The Health and Disability System Review (2020) recommends that institutional racism be recognised and addressed and cultural safety be incorporated into all

healthcare service delivery models. Nurse Practitioners in NZ can form an integral part of these proposed new models of care as they work within a social justice paradigm, understand and accommodate cultural differences, promote health and well-being, and they can assist in reducing health inequities for Māori communities (Carryer & Yarwood, 2015).

The *New Zealand Health Strategy* (2016) encourages the integration of services across primary, secondary, and tertiary services and emphasises the importance of multidisciplinary collaboration and wellness preservation. Long-term complex conditions require supportive, respectful, responsive, and person-centred services, including palliative care. Primary care and community services need to work together to improve the management of long-term conditions (Ministry of Health, 2016b). Therefore, the role of Nurse Practitioners is so important as it can contribute enormously to the health system reform policy's objectives and goals. A study by Carryer and Adams (2017) indicates that NPs in New Zealand remain committed to a nursing philosophy that embraces a person-/family-centred, collaborative approach to care and supportive interprofessional practice. This is highlighted by the fact that NPs work within Māori communities, connect with the local community, provide access to health services, and improve health outcomes.

The Nurse Practitioner Workforce (1998-2022)

Nurse Practitioners are Registered Nurses (RNs) who practice at an advanced level. They incorporate nursing skills with aspects of medicine, including patient diagnosis, assessment, management, ordering diagnostic tests, and prescribing medications (Pirret et al., 2015). In 1998, the NZ Ministerial Taskforce on Nursing published a document recognising nurses' potential to significantly contribute to improved healthcare outcomes, specifically through the development of the NP role. The taskforce envisioned NPs serving in various settings, such as community healthcare, hospitals, schools, and other care-providing services. The primary goal for NPs was to enhance healthcare access, especially for marginalised communities, including Māori Peoples (Ministerial Taskforce on Nursing, 1998). In 2001, the NCNZ responded to the taskforce's findings by identifying areas for NP practice, including chronic disease management, mental health, emergency care, perioperative care, primary care, palliative care, and high-dependency care.

In the same year, NCNZ trademarked the term "Nurse Practitioner" ™ (Nursing Council of New Zealand, 2001) and established a separate scope of regulated practice for individuals holding this title. The legislative act regulating NPs in NZ is the *Health Practitioners Competence Assurance Act* 2003 (HPCA). The primary purpose of the *HPCA Act* is the protection of the health and safety of the public by providing mechanisms to ensure that health practitioners are competent and fit to practice within their professions ("Health Practitioners Competence Assurance Act ", 2003, pt. 1, s. 3.). The endorsement of the NP title by the national regulator, (NCNZ), ensures NPs' competence and fitness to practice to benefit the public, healthcare professionals, policymakers, and overall public safety (Hughes & Carryer, 2002).

In the subsequent year, the NCNZ implemented the registration process for the NP scope of practice (NCNZ, 2002). To become a registered NP in NZ, an individual must possess a minimum of four years of experience as an RN in a specific practice area and have completed a clinical master's degree, which includes an approved NCNZ prescribing practicum. Additionally, they must demonstrate the attainment of the required advanced practice competencies. The clinical master's degree programme entails a prescribed pathway of NCNZ-approved papers in pathophysiology, pharmacology, advanced clinical assessment, diagnostic reasoning, and prescribing practice (NCNZ, 2019). Upon completing an individual practice portfolio and a panel/verbal assessment, the applicant is endorsed as an authorised prescriber and deemed competent to assess, diagnose, and order patient investigations. Nurse Practitioners possess the same legal and prescribing privileges as medical practitioners within their area of speciality (Lim et al., 2017). New Zealand's framework for NP registration is regarded as rigorous regarding legislative, educational, and registration requirements and compares favourably to those of the United States (US), Canada, and Australia (Adams & Carryer, 2019).

According to Carryer and Adams (2020), significant progress has been made in removing barriers to NP practice through nurse leaders and academics consistently lobbying for legislative changes. An amendment to the *Medicines Act* in 2014 granted NPs the status of authorised prescribers, giving them the same prescribing authority as medical practitioners within their speciality area. This encompassed the ability to prescribe controlled drugs, special authority medications, and issue standing orders for other healthcare professionals. Subsequently, in 2015, several changes to NZ legislation occurred, including the *Health Practitioners Competence Act Amendment Bill* and the Replacement of Statutory References to the *Medical Practitioners Bill*. These legislative amendments revised the wording from "medical practitioner" to "health practitioner" or included the designation of NP alongside medical practitioners. These changes have enabled NPs to carry out functions previously restricted to medical practitioners, such as certification of death and cremation and signing sick leave certificates.

Despite these changes, the initial growth of the NP workforce was slow, with only 150 NPs registered in the first 13 years by 2015 (NCNZ, 2020). Sangster-Gormley et al. (2013) attribute this limited growth to the perception of NPs as intruding into the medical profession, particularly in prescribing and care management, and a lack of understanding of the NP role (Forbes et al., 2018). However, in May 2020, the number of NP registrations significantly increased to over 459, reflecting the successful implementation of a government-funded pilot programme, the Nurse Practitioner Training Programme (NPTP), in 2016 at two universities.[1] The Nurse Practitioner Training Programme requires candidates to have completed half of a master's degree, secure an employer's agreement to provide an NP position once endorsed, and

[1] Funding for NPTP was increased by 51.3% to 121 fully funded places in 2024, including 17 Māori and 5 Pacific NPs (NPNZ, 2024)

complete a 500-hour clinical practicum under the supervision of an authorised prescriber (medical practitioner or NP). The Nurse Practitioner Training Programme follows a process of endorsing practice portfolios (demonstrating NP competencies) and undergoing an oral viva assessment with an expert panel appointed by NCNZ. This process has significantly increased the number of NPs in training and employment in NZ, with the government funding NPTP through three universities (Adams, 2020). As of February 2022, the number of NPs rose to 607 since 2016.[2] However, the funding allocation for NPTP poses challenges, as the Director of Nursing receives it from a DHB that manages the application and allocation process. This funding process has been perceived as disadvantageous to nurses working in PHC, residential aged care, Māori, Pacific, and iwi health providers. Notably, Māori and Pacific NPs represent a minority subgroup, accounting for only 11% of NPs in NZ. Furthermore, a significant number of nurses (35% of 55 surveyed) have had to self-fund their NP training and were unaware of the national funding (Adams, Oster, et al., 2022).

The commitment of NCNZ to enable NPs to provide a broad spectrum of care was exemplified through the revision of key NP competencies and education programme standards, which were implemented in April 2017 (Carryer & Adams, 2020). To ensure comprehensive input, NCNZ engaged in an extensive two-year consultation process involving health services stakeholders, professional organisations, and tertiary education institutions. This collaborative effort resulted in the receipt of 63 submissions. As a result of this consultation, several important changes were made. Firstly, the restriction on NPs practicing in a specific practice area was removed. Instead, NPs, as advanced practitioners, are now expected to self-regulate and practice within their areas of competence and experience. Secondly, the education programmes for NPs were revised to establish a consistent educational and clinical learning standard. These programmes undergo accreditation and approval by NCNZ to ensure their quality and adherence to the standards set by the council. Lastly, the scope of clinical knowledge for NPs has been expanded to include developing advanced skills in multiple settings. This change recognises the diverse contexts in which NPs may practice and encourages their growth and proficiency across different healthcare environments (NCNZ, 2017).

The revised NP competencies, as outlined in Table 1, have been further broken down into multiple indicators to provide detailed guidance and assessment criteria. The clinical practice is supervised in employment by the nominated clinical mentor, who is an authorised prescriber.

[2] Total number of NPs in NZ at the time of thesis examination in February 2024, is estimated at 760 (NCNZ, 2024).

Table 1

Key Themes in the Assessment of NP Competence

Description of key themes
Provides safe and accountable advanced practice (Competency 1)
Assesses, diagnoses, plans, implements, and evaluates care (Competencies 2 and 3)
Works in partnership with health consumers (Competency 4)
Works collaboratively with healthcare teams (Competency 5)
Works to improve the quality and outcomes of healthcare (Competency 6)

Note. Sourced from the NCNZ (2017).

The Nursing Council of New Zealand (2017) claims that the revised competencies listed in Table 1, the scope of practice, and revised education programme standards for NPs are implemented and regulated by NCNZ and aim to provide NPs with improved ability to meet the diverse healthcare needs of the population. Following is an overview of the indicators for the six NP competencies.

All competencies (except 2 and 3) are assessed through an NP practice portfolio and audited before the oral viva assessment. The oral viva assessment with the expert panel assesses competencies 2 and 3 with the NP candidate. Competency 1 indicators ensure patient safety, quality of care, and the NP's ability to provide adequate healthcare services. Competency 2 indicators aim to evaluate the NP's ability to conduct a thorough assessment, apply diagnostic reasoning and make accurate diagnoses. Competency 3 indicators assess the ability to develop, plan, implement, and evaluate therapeutic interventions to manage episodes of care effectively. This practice is essential for delivering person-centred care, promoting positive health outcomes, and ensuring patient safety. Competency 4 indicators assess the ability to involve the healthcare consumer in decision-making and actively engage them in their care. By fostering trust, respecting diversity, providing education and support, and promoting health literacy, the NP empowers the healthcare consumer to make informed decisions and actively participate in their healthcare journey. These competencies are vital in promoting patient-centred care, improving health outcomes, and establishing collaborative relationships between NPs and healthcare consumers.

Competency 5 indicators assess the NP's capacity to collaborate effectively with interprofessional teams and stakeholders, aiming to optimise health outcomes for healthcare consumers and population groups. By fostering collegial relationships, facilitating transitions in care, demonstrating leadership skills, promoting nursing, and contributing to the professional growth of colleagues, NPs play a crucial role in achieving positive health outcomes for

healthcare consumers. This competency is particularly interesting in current research exploring organisational opportunities for NPs to make decisions about the means and methods of performing their role.

Competency 6 indicators require NPs to demonstrate the skills and knowledge needed to improve the quality of healthcare service and safe practice. They involve using critical inquiry skills to evaluate and enhance the quality of healthcare, minimising risks for healthcare consumers and providers. Nurse Practitioners must advocate for innovative healthcare changes, understanding socio-political issues, funding, business practice and new technologies. The indicators assess the ability to critically appraise scientific literature, disseminate new knowledge, and develop best practice guidelines. They also highlight the importance of understanding diversity, cultural safety and socioeconomic determinants of health when planning and providing healthcare services and further demonstrating a commitment to the Treaty of Waitangi/Tiriti o Waitangi. Nurse Practitioners must demonstrate knowledge of Māori health and socioeconomic disparities, which is essential in partnering with Māori healthcare consumers and providers to improve inequities in access and outcomes. Lastly, the indicators require a demonstration of influencing and critiquing health policy and nursing practice through leadership and active participation in the workplace and professional organisations (Nursing Council of New Zealand, 2017).

In New Zealand, the successful implementation of the NP role relies on the support and acknowledgement of the health profession, which can be achieved by being informed about the NP role to minimise role confusion and promote collaborative practice (Mackay, 2003). Primary healthcare is delivered through privately owned (for-profit) physician-led general practice, and the medical profession is perceived to dominate national policy decisions and service delivery. Adams and Carryer (2021) illustrate that the intent of PHOs to provide health promotion and prevention strategies has not been fulfilled as primary care physicians, the principal shareholders, manage the general practices. This situation of medical dominance has not been challenged and has contributed to establishing an acute biomedical model of general practice. There are five NP-led and owned practices nationally out of 656 registered NPs in 2022, and 56.4% of NPs have a PHC area of practice (Nursing Council of New Zealand, 2023).

The development of the NP roles remained limited in the first two decades of NP practice in NZ due to the medical hegemony, funding, and employment relationships, including poor understanding of the NP role (Adams et al., 2020). Some misunderstandings of the NP role in PHC settings are that NPs can own their practice, claim general medical services, capitation funding, and enrol their patients. There is no requirement for NPs to work with GPs as they are independent, autonomous, and authorised prescribers accountable for their practice under the *Health Practitioners Competence Assurance Act* (2003) (Ministry of Health, 2022d).

The capacity of the NP workforce to improve access to health services is of growing importance as the NZ healthcare system is under increasing pressure, predominantly from the

epidemic of long-term conditions (Carryer & Adams, 2017). Global shortages of the health workforce, especially primary care physicians in rural and deprived regions in NZ, are increasing. According to the Commonwealth Fund's 2022 International Health Policy Survey of Primary Care Physicians findings, the global PHC crisis is escalating. The two years of the COVID-19 pandemic have exacerbated the situation where regular healthcare has been disrupted, mental health problems have spiked, and access to PHC has been compromised. The survey identified that younger physicians (under the age of 55 years) are experiencing stress and burnout. In New Zealand, 59% of physicians over 55 intend to retire in the next one to three years, meaning that most PHC physicians may soon be younger professionals who are stressed and burned out (Gunja et al., 2022).

Therefore, it is time to develop new models of care and integrated inter-disciplinary PHC teams, including NPs, to improve the coordination and provision of healthcare to the public. It is essential to develop an understanding of organisational opportunities for NP decision-making, as it has been established through research undertaken in NZ and overseas that contributions from NPs can safely meet the needs of the population with long-term conditions, improve the level of care for the vulnerable and improve access to health services (Barker et al., 2018; Burgess & Purkis, 2010; Gagan et al., 2014; Sangster-Gormley et al., 2013). One model of NP-led primary care that may address long-term conditions and health inequalities is person-centred care.

Nurse Practitioners and Person-Centred Care

The practice of NPs is centred around the individual, focusing on patient empowerment, holistic care, collaborative partnerships, continuity of care, and cultural sensitivity, which are requirements of NCNZ NP competencies. Nurse Practitioners play a unique role in promoting person-centredness, which is crucial for achieving better health outcomes and enhancing patient experiences (Bonner et al., 2020; Carryer & Adams, 2017; McLachlan et al., 2015; Pond et al., 2021).

Since 2009, the World Health Organisation (WHO) has actively promoted the PCC framework, which places people at the centre of healthcare. It emphasises the importance of providing individuals with the necessary education and support to make informed decisions and actively participate in their care. In addition, people-centred healthcare is organised around people's health needs and expectations, prioritising their well-being over a narrow focus on diseases (World Health Organization, 2015, p. 2).

Nurse Practitioners work within the PCC framework and provide safe and effective care, improved access to healthcare, and high patient satisfaction (International Council of Nurses, 2022b), and play an essential role in meeting the expectations set by WHO. This was confirmed by international research. Ploeg et al. (2013) found that NPs in long-term care settings worked within a person- and relationship-centred approach to care for clients and their families. Nurse Practitioners recognise and respect the uniqueness of every person,

demonstrated by information sharing, informed flexibility, mutuality, negotiation, valuing patients' views, and compassionate presence (Bentley et al., 2016; Bonner et al., 2019; Carthon et al., 2022). Bonner et al. (2020) describe an innovative PCC model of care NPs provide for patients with multiple long-term conditions in an Australian (integrated chronic disease -ICD) outpatient clinic. The patients were very satisfied with the care and high attendance at the ICDNP clinic. This was attributed to the PCC approach to care, such as the accessible location, access to public transport, parking, and follow-up telephone consultations, allowing for re-booking appointments if required. The person-centred healthcare delivery model focused on interconnecting multiple chronic diseases and successfully integrating health services. This model is proposed to be implemented within and across organisations to meet future healthcare demands (Bonner et al., 2020).

Another example of the PCC model of care within the general practice was explored in Newcastle, Australia, providing an NP-led mobile memory clinic (Pond et al., 2021). The clinical trial was established due to the increasing number of people with dementia who often did not receive timely diagnosis and the required support. The geographical area was deemed to be poorly serviced by specialist medical services. The results indicated that the NP-led model improved the assessment of patients in PHC and was highly acceptable for patients and their caregivers. Carer support is critical because it provides an opportunity to accept the dementia diagnosis and support services in full knowledge of the prognosis. A Nurse Practitioner PCC model of care provided holistic, personalised, and comprehensive care, which was more effective than secondary care. The other positive outcomes of the study were the improved collaboration among practice nurses, NPs, and GPs by improving knowledge about access to referral services and education about administering cognitive tests. Pond et al. (2021) proposed that ongoing collaborative practice is more likely to deliver a higher level of service that can be provided by an individual health practitioner working alone.

Furthermore, a four-year study by a cardiology NP-led clinic to support patients following heart valve surgery in Middlemore Hospital in South Auckland demonstrated a novel approach to managing complex patients with unique health, social and cultural needs. McLachlan et al. (2015) showed that the PCC approach, by exploring healthcare and socioeconomic issues, providing longer consultations, and coordinating care, has positive outcomes for healthcare consumers. All patients received lifestyle advice, links to community and cultural support networks, individual support with cardiac complications, and referrals if necessary. Nurse Practitioners' understanding of social determinants that impact the patient's ability to manage their health needs is essential in achieving individual outcomes, and these can be overlooked in a busy clinic. The Nurse Practitioner-led clinic is now established as part of the cardiology service, and an educational and credentialing process was also developed to expand the existing cardiology nurse specialist workforce (McLachlan et al., 2015). Nurse Practitioners are well-positioned to provide PCC and can be part of the solution to improving

access to health services, especially for Māori, rural, and marginalised communities (Carryer & Adams, 2017; Carryer et al., 2011).

International Insights: Rural Versus Metropolitan Nurse Practitioner Practice

The global shortage of healthcare practitioners in rural areas has been a concern for many decades, particularly in countries with large land masses containing isolated rural and remote communities, such as Australia and Canada (Goodyear-Smith & Janes, 2008). In response to this issue, Australia introduced the NP model to address health service gaps in rural areas. Similarly, the NP's role in NZ was designed to enhance access to healthcare services and address poor health outcomes among Māori and other marginalised communities. However, both countries (Australia and NZ) have faced challenges in fully realising the vision for the NP role, primarily due to organisational obstacles, including NP role ambiguity, financial constraints, and dominance of the biomedical model of care (Adams, Mustafa, et al., 2022; Smith et al., 2019).

Internationally, studies have emerged comparing rural to metropolitan practice, highlighting significant differences. In the United States, Spetz et al. (2017) investigated the autonomy and job satisfaction of NPs in rural settings using descriptive analysis of the National Sample Survey of NPs. The study revealed that NPs working in isolated, small rural regions exhibited significantly higher job satisfaction than their metropolitan counterparts (p=.009) despite having a more increased workload. Moreover, they displayed lower turnover rates within 1-2 years (p=.022) and reported greater autonomy in their practice (p=.012). Organisational factors, such as a collaborative approach, practice autonomy, and respectful management, have been identified to enhance retention. Therefore, the authors recommended that supporting NP practice in rural healthcare settings involves collaboration with rural physicians to address the healthcare needs of rural communities.

Bae (2016) conducted a secondary analysis of the National Sample Survey of NPs, obtaining a sample of 9010 NPs to explore the relationship between job satisfaction and work conditions in rural versus metropolitan regions. The study revealed that both groups of NPs had higher job satisfaction when their skills were fully utilised. However, among rural NPs, the degree of NP skill utilisation (autonomy) significantly impacted higher job satisfaction. Additionally, practice autonomy and collegial support were identified as key contributors to job satisfaction and potential drivers for greater retention.

In Australia's rural practice, Smith et al. (2019) highlighted the significance of support from professional colleagues, clarity in the NP role, and the removal of legislative barriers to practice to improve access to healthcare. The study identified that the healthcare system retained a traditional hierarchical model with medical dominance, which hindered progress. To overcome these barriers, the authors emphasised the need for innovative models of care and organisational support, along with removing legislative obstacles affecting the rural NP role.

An example of an innovative NP mental health service model was evaluated by Barraclough et al. (2016) in a rural town in New South Wales. The service consisted of one full-time mental health qualified NP based in a non-government and non-health organisation in the town centre. The Nurse Practitioner provided clients with flexible, prompt, short- and long-term support, including preventative care and health education. Most clients were adults, although 2% were between the ages of 10 and 14. The service received high regard and was considered more accessible than other mental health services. The potential impact of reducing mental health acute admissions was observed, with a reduction from 152 to 30 within two years of the start of the NP service. The study highlighted the potential for service integration as the model was developed based on the specific needs of a small rural community.

The international studies of the NP rural workforce have identified a common theme: NPs achieve practice autonomy and experience higher job satisfaction. Support from funders and the medical profession, along with removing legislative barriers, is necessary for implementing innovative NP models of care. Further research is required to identify the context of NP practice in rural regions in NZ. The present study aims to investigate whether rural area NPs differ from metropolitan NPs in their experience at work.

Empowering Nurse Practitioners Through a Supportive Role Environment

Support from the healthcare team is fundamental to establishing and maintaining effective NP roles and NP job satisfaction. Several studies have shown that interprofessional support is crucial in establishing NP roles in multidisciplinary teams, especially support from medical professionals (Arendts et al., 2018; Forbes et al., 2018; Hagan & Curtis, 2018; Lowe et al., 2013). A global scoping review of barriers and facilitators to the implementation of advanced NP roles in PHC was conducted by Torrens et al. (2020). Fifty-four studies published between 2002 and 2017 were included in the review. Half of the studies (n=27) were conducted in North America and contained a qualitative design. The primary healthcare NP role was diverse, and NPs worked across the lifespan with multiple population groups, yet there was a lack of agreement about what constituted practice autonomy. Team factors were reported as most important (n=31) in successfully implementing an NP role, including collaboration and developing trust with professional colleagues. The scoping review identified two significant barriers: (1) team factors, such as lack of support and collaborative relationships with both interprofessional and intraprofessional groups, and (2) lines of responsibility, which is a lack of role definition in relation to other team members and unclear expectations about the scope of practice. The scoping review emphasised that mentoring and supervision were crucial in NP role implementation. Organisational support from leaders in the form of adequate provision of mentorship and supervision, as well as financial support for education and practice, are vital to the progress of NPs (Torrens et al., 2020).

The impact of organisational support for NPs has been extensively explored in various practice settings in the US. Poghosyan et al. (2020) investigated workforce outcomes such as

job satisfaction, intent to leave, and quality of care among NPs (*n*=398) in primary care. Organisational support was measured using the Nurse Practitioner Primary Care Organizational Climate Questionnaire (NP-PCOCQ) subscale. The study found a higher organisational-level score was associated with increased job satisfaction, improved quality of care and decreased odds of intending to leave the current job. This confirmed that a higher level of organisational support for NPs was linked to greater job satisfaction, lower intent to leave, and improved quality of care. The lack of organisational support was associated with NP role ambiguity. By enhancing organisational support for NPs, the primary care providers can contribute to implementing new care models, maximising access to healthcare services and improving the quality of outcomes for healthcare consumers (Poghosyan et al., 2020).

Alexander et al. (2023) conducted a study exploring nursing home care environments in the US where NPs work, utilising NP-PCOCQ adapted to fit the nursing home setting (NP-NHOCQ). This qualitative study (*n*=13) investigated the NP practice, the overall goals of NP practice, and workplace challenges. The findings highlighted that including NPs in the workforce can improve resident outcomes but will not solve quality problems if the environment is unsupportive and lacks collaboration (e.g., inability to access and retrieve resident information). A shortage of resources can contribute to a lack of autonomy and independent practice for NPs. The visibility of NPs and stakeholders' understanding of the role, including supportive collegial, physician and managerial relations, were crucial factors.

The effect of organisational support on practice outcomes among NPs in Taiwan was also examined using the NP-PCOCQ. The study focused on job satisfaction, care effectiveness and intention to leave. In Taiwan, NPs primarily practice in acute care hospitals. Ho et al. (2021) conducted a national survey (*n*=512) and identified that organisational support, supportive relationships with managers, and positive care outcomes were associated with improved NP practice. The study found that organisational support was the most significant predictor of higher job satisfaction for NPs, explaining 50% of the total variance in job satisfaction.

Further exploration of NP role support was conducted by Whitehead et al. (2022) in an Australian scoping review of the international literature to identify the factors influencing the development of NP candidacy programmes. A total number (*n*=22) of publications were included in the scoping review. Novice NPs identified collegial support as necessary in the role transition and the development of competence and growth in confidence. The collegial support was provided by fellow NPs, collaborating doctors, and medical directors. The mentorship of NP candidates and novice NPs was considered a crucial element to success during their initial stages, with barriers described as experiencing feelings of insecurity, frustration, isolation, and a lack of confidence in decision-making. The availability of a mentor during clinical practice was reported as most important in 85% of the NP candidates when selecting a fellowship programme in the US. Regular support from mentors (NPs and doctors) was associated with

improved job satisfaction and retention, including building self-confidence. It was linked to a psychological perception of safety in the workplace. The overall acceptance within a health service was related to the socialisation of the NP candidates and novice NPs as a form of networking, enhancing communication, and collegial support (Whitehead et al., 2022).

The international literature on NP role support identifies the healthcare team, collegial and organisational support as common themes. These factors are associated with fostering job satisfaction, practice autonomy, and visibility of NPs. However, research in NZ has yet to determine whether support from direct supervisors and colleagues can enhance NPs' decision-making freedom. This study aims to explore the NPs working in public hospitals, primary healthcare, community, and residential aged care settings, including rural and metropolitan locations, to identify the organisational opportunities for NPs to make decisions about their practice. Empowering NPs with the ability to make decisions about the means and methods of their role will enable them to reach their full economic and clinical potential, ultimately improving effectiveness. Nurse Practitioners have the potential to contribute to the transformation of the current healthcare system and make a positive impact on the individuals, families, and communities they serve (Adams & Carryer, 2019; Gagan et al., 2014).

Summary

Nurse Practitioners in NZ are vital in providing advanced nursing care and improving access to quality healthcare services. As New Zealand's healthcare system faces increasing pressure, mainly due to the rising prevalence of long-term conditions, the significance of NPs has continued to grow (Carryer & Adams, 2017). Nurse Practitioners are highly specialised RNs with a master's education and training, equipping them to diagnose and treat illnesses, prescribe medications, order investigative tests and referrals, and provide comprehensive patient care (Pirret, 2008). Nurse Practitioners advocate for equal access to healthcare services and collaborate with interdisciplinary teams to reduce health inequities. Following a person-centred approach, NPs aim to address health inequities by focusing on each person's individual needs, preferences, and goals (Carryer & Adams, 2017). The person-centred model recognises the diverse backgrounds, experiences, and social determinants of health that influence an individual's well-being (Ploeg et al., 2013).

Professional colleagues are crucial in supporting NPs, NP candidates, and novice NPs (Whitehead et al., 2022). Collaborative practice with other healthcare professionals enables NPs to work synergistically, leveraging their expertise and knowledge to provide comprehensive care. Collegial support includes mentorship, guidance, and a nurturing environment for NPs to practice at the top of their scope of practice (Kerr & Macaskill, 2020). Therefore, interprofessional teamwork improves patient outcomes and collectively addresses health inequities. In summary, NPs in NZ can significantly contribute to the healthcare system by delivering person-centred care and playing an essential role in achieving the government's policy objectives and goals within the context of current health system reforms.

Based on the background provided, this research aims to develop an understanding of the organisational opportunities available to NPs in making clinical practice decisions across various healthcare settings in NZ. The theoretical "role control support" was selected to inform the study, as it explores the relationships between work characteristics related to employee well-being, health, and performance (Karasek & Theorell, 1990). This theory has been globally validated over the past 50 years in various occupations, including nursing (Amin et al., 2015; Amost & Laschinger, 2005; Baba et al., 2013; Bagheri et al., 2017; Bonneterre et al., 2008; Eum et al., 2007; Gao et al., 2017; Merrick et al., 2012; Navajas-Romero et al., 2020; Triana-Palencia et al., 2019). The study's aim, relevant research questions, and an outline of the thesis structure follow.

Aim of the Study

This research aims to identify the organisational opportunities for NPs to make decisions about the means and methods of performing their role.

Research Questions

1. Does support from colleagues and/or supervisors influence NPs' freedom to make decisions about practice?

2. Is there a relationship between social support and NP-patient relationships, and does the freedom to make decisions about practice influence this relationship?

3. Are the demands of performing a role associated with NPs' freedom to make decisions about practice?

4. Is the geographical location of practice associated with the freedom that NPs have in making decisions about practice?

5. Is there a relationship between work commitment and job security for NPs, and if so, does the geographical location moderate this relationship?

Thesis Structure

The structure of this thesis includes six chapters. Chapter One has provided background to this study, its aim and research questions. Chapter Two will conduct a comprehensive literature review on NP collaborative practice in NZ and Australia since establishing the NP role in 2002 in both countries. The Nurse Practitioner role in Australia has a comparative scope of practice, education, and registration requirements as NPs in NZ. The chapter will critically analyse the findings, provide an overview of the NP-led services, and compare the current status of the NP roles in Australia and NZ, as both originated with a similar intent.

Chapter Three will outline the theoretical model employed in the study. It will also summarise relevant international studies that have validated the JCQ in nursing. Chapter Four will detail the research design used to address the research questions and present the statistical analysis plan. Chapter Five will present the study's findings and analyse the results obtained. In the final chapter, Chapter Six, the research findings will be thoroughly discussed, and their implications for future NP practice in NZ will be explored. The chapter will conclude with a summary of key conclusions drawn from the study. The next chapter contains a literature review of NP collaborative practice research since the implementation of the NP role in Australia and NZ.

Chapter Two: Literature Review

Introduction

The literature review aims to explore the research conducted in New Zealand and Australia about the role of NPs and collaborative practice across various practice settings and whether organisational factors such as managerial, supervisory, or collegial support potentially impact NPs' decision-making. Australian NP research was included in the literature review due to the similarities in NP roles, education, professional organisations, and research collaboration, for example, the generic standards development for NP practice research in both countries (Carryer et al., 2007; Gardner et al., 2006).

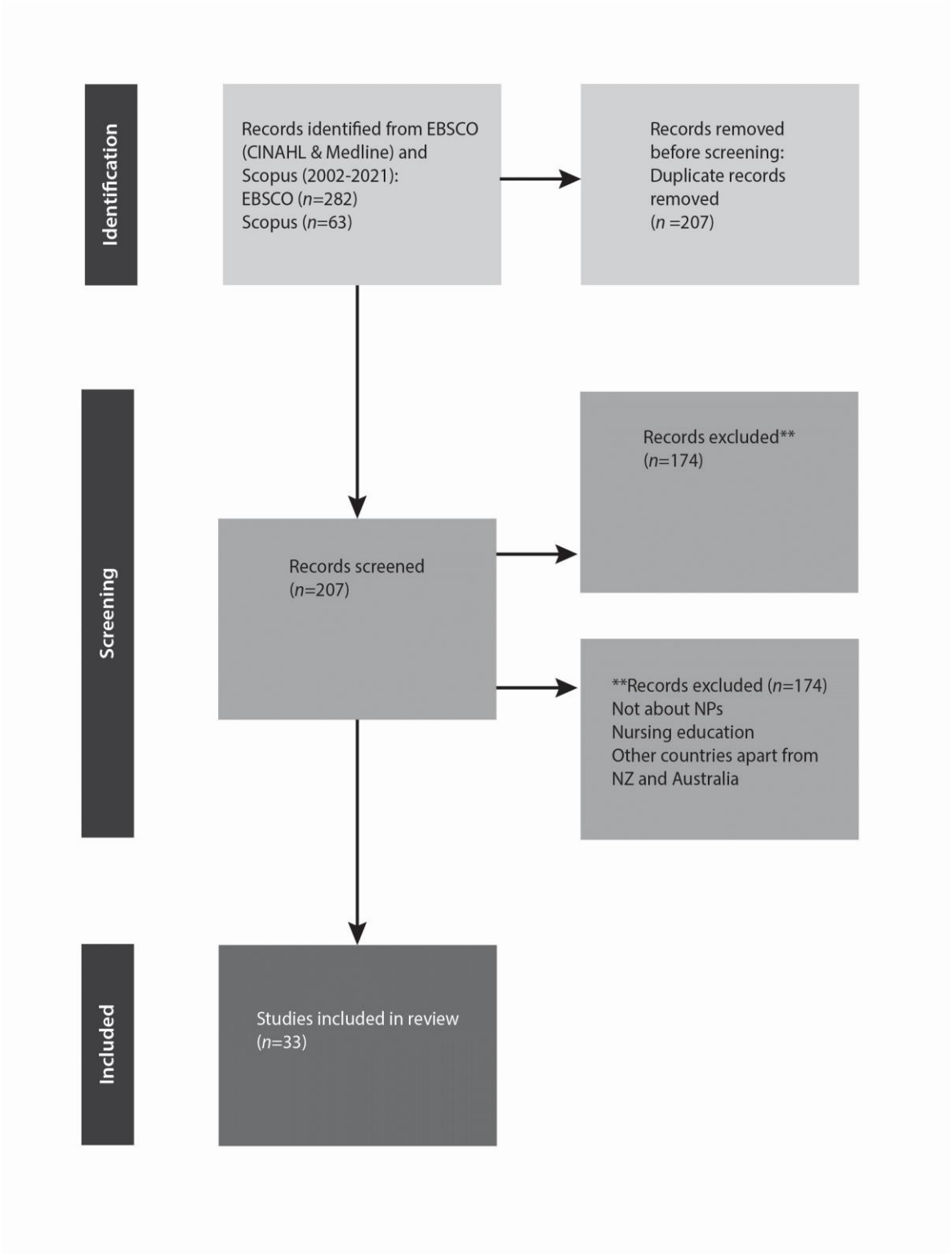
This chapter describes the database search strategy process used to identify pertinent research evidence; it is also a quality review of the published research, followed by a critical appraisal of the literature. The synthesis of the presented findings facilitates an exploration of the gaps in current research about NP collaborative practice, thus providing a contextualisation of the research presented in this study.

Database and Search Process

The literature review was conducted with the support of the Auckland University of Technology's specialist librarian using the PRISMA framework (Page et al., 2021), as illustrated in Figure 2, to examine the following computerised databases: the Cumulative Index to Nursing and Allied Health Literature (CINAHL Complete via EBSCO); MEDLINE (via EBSCO), which is a bibliographic database covering all fields of medicine, nursing, allied health, and the healthcare system; and Scopus, which is the database containing abstracts and citations for academic journal articles including medicine, nursing, and science. The literature review began in 2002, which was the first year of NP endorsements in NZ—note, therefore, that the research undertaken for this thesis could only be influenced by work published up to the end of April 2023. The last search for the literature review was conducted on the 30th of April, 2023.

Figure 2

Literature Review PRISMA Diagram



Note. PRISMA diagram reference: Page et al. (2021).

The search terms in Table 2 were used across the databases. The results are summarised in the PRISMA diagram (Figure 2). Figure 2 illustrates that 207 articles were retrieved and screened, and 174 were excluded because they were not about NPs, were not focused on nursing education, and/or comprised research conducted outside of NZ and/or Australia.

Table 2

Literature Review Search Terms

Search terms		
Search terms #1: "Nurse Practitioner*" or "advanced practice nurs*" or apn		
Search terms #2: support* or encourage* or development* or preceptor* or attitude*		
Search terms #3: colleague* or collaborat* or co-worker* or peer* or preceptor* or mentor*		
Search terms #4: manage* or leader* or supervis* or executive*		
Search terms #5: "New Zealand" or Aotearoa or NZ or Australia or Australasia		
Search terms identifiers	Number of articles identified	Number of articles meeting inclusion criteria
	EBSCO (CINAHL & Medline)	
#1 and #2 and #3 and #5	190	18
#1 and #2 and #4 and #5	92	9
	Scopus	
#1 and #2 and #3 and #4 and #5	63	6
Total	345	33

Note. Articles were identified prior to removing duplicates.

Abbreviation. NZ, New Zealand.

Inclusion criteria comprised primary research published in peer-reviewed journals about the NP role. The search was limited to the English language. The exclusion criteria were discussions, opinions, research protocols, and editorials. Research that discussed RNs, clinical nurse specialists, or student nurses was excluded from the review. The articles that met the inclusion criteria were quality appraised by the author using methodologically appropriate checklists according to the Mixed-Methods Appraisal Tool (MMAT) (Hong et al., 2018). The Mixed-Methods Appraisal Tool was used to assess study quality. It is designed for the appraisal stage of systematic mixed-methods studies such as qualitative, quantitative, and mixed-methods research publications. The author and supervisor evaluated the included articles' quality, and the summary of the findings was entered into the MMAT matrix (Appendix B).

The author selected MMAT due to a comprehensive and standardised approach for evaluating the methodological quality of empirical studies, such as primary research in this

literature review. MMAT enables the appraisal of the most common study methodologies and design types (Hong et al., 2018). Moreover, it allows for synthesising evidence from qualitative and quantitative studies, providing a structured approach to ensure transparent reporting of the appraisal process, thereby enhancing the robustness of this literature review. The reliability and efficiency of MMAT have been demonstrated through successful application in evaluating diverse study designs (Pace et al., 2012).

Every article that met the inclusion criteria was assessed, reviewed, and entered into a descriptive matrix, as presented in Table 3 below. The matrix method was used as described by Machi and McEvoy (2016) to extract and summarise articles into a matrix under the following headings: article details, sample size, design of the study, country, participant characteristics, primary outcomes and findings, and limitations or bias.

Table 3

Literature Review Matrix

Article	Sample	Design	Country	Participant characteristics	Main outcome	Limitations/ bias
1. Mackay (2003)	*n*=108	Survey	NZ	GPs in PHC in Northland, NZ (46.3% response rate).	The overall perception of the NP role was favourable. Concerns about prescribing, physical examination, and lab test ordering. Confusion about NP scope of practice, professional boundaries, and legal responsibility.	Results were limited to Northland. It cannot be generalised to a larger population of doctors in NZ. Non-response bias (low response rate of 46.3%).
2. Pirret (2008)	*n*=133	Quantitative comparative and pre-post (12-month) implementation design	NZ	750-bed tertiary hospital in south Auckland serving a population of 450,000. In NP-led critical care outreach service (CCORS), 133 NP referrals resulted in 525 patient visits.	Post implementation of CCORS, there was a sustained reduction in ICU readmissions <72 hrs and unplanned ward admissions. NP-led service had a positive impact on patient outcomes. Complements existing doctor services.	CCORS was added to the existing service of doctors and MET. NPs only worked 3 shifts/week, and the number of referrals was small, limiting analysis. Non-simultaneous comparison bias due to comparison of historical data.
3. Carryer et al. (2011)	*n*=70	Qualitative descriptive survey	NZ (rural)	92 nurses with rural addresses in NZ; 21 respondents were working in a rural location and aiming to become NPs.	Four themes were identified: (1) uncertainty (employment, lab tests, no clear remuneration, legislative and funding barriers); (2) resistance and lack of support from doctors, nurse colleagues and managers; (3) difficulties with the NP authorisation process; and (4) difficulties meetings some competencies due to a rural location (leadership and influencing practice at local and national levels; scholarly research inquiry).	Difficulties in identifying NP candidates in rural practice. Online recruitment (professional organisations only) as the Nursing Council does not record rural addresses. It may not reflect the rural nurse population interested in the NP pathway.
4. Gagan et al. (2014)	*n*=90	Two surveys-qualitative and quantitative	NZ	Two surveys were emailed to NPs via NPNZ (Nurse Practitioners New Zealand) using the PEPPA model. 1st survey response rate: 14 out of 88. 2nd survey response rate: 76% (76 out of 100).	After 10 years of NP practice in NZ: No clear clinical practice model or working to full potential. The need for a team approach included healthcare system leadership, funding, and clinical team integration. NPs were often driven to develop their role without administrative, collegial or consumer support.	Small studies and few NPs in NZ (14 out of 88 responses). Lack of control of data collected, analysed, and submitted by individual NPs. Potential response bias.
5. Pirret et al. (2015)	*n*=46	Comparative study	NZ	30 NPs and 16 doctors compared diagnostic reasoning abilities in a complex case presentation at an acute tertiary hospital in Auckland.	NPs collaborate timely with consultants more frequently than doctors. NPs' analysis of complex patient cases compared favourably to that of doctors (completing their speciality training).	NPs in NZ cannot be generalised to NP practice in other countries. The doctor sample size was small, may not reflect the population, and was therefore underpowered.
6. Harvey (2015)	*n*=35	Mixed-methods results-based logic model	NZ	NP members of the College of Nurses: 35 out of 66 members responded to the survey (53% of 120 NPs registered in NZ). 16 interviews were conducted to achieve data saturation.	Almost all (91%) of NPs thought their role was sustainable. 82% thought that other health professionals accepted the NP role. Organisational and geographical factors were the main reasons for hindering practice. 97% could identify areas that directly contributed to care efficiencies. The inequity of position entitlements: role being interchangeable with doctors and RNs.	Small sample size — 35 out of 120 NPs registered. It may not reflect the NP population at the time. Non-response bias due to the low number of participants.

Article	Sample	Design	Country	Participants characteristics	Main outcome	Limitations/ bias
7. Carryer and Adams (2017)	*n*=13	Qualitative exploratory study	NZ (rural)	13 NPs were interviewed across NZ in PHC in rural locations. All participants were female, from 1–12 years of practice as NPs.	Theme findings re NP-led care were: Providing comprehensive person and family care. Seamless care and collaboration: integrated care by functional MDT through connected pragmatism. Freedom to implement the full potential of the role without constraints such as lack of funding and management decisions preferring medically focused care rather than person-centred.	Small study: 13 NPs in rural PHC.
8. Forbes et al. (2018)	*n*= 113	Descriptive mixed-method design with survey	NZ	29 long-term care facilities (LTFC) at the hospital level of care. 75 Registered Nurses (RNs) returned the survey: of 295, 7 out of 20 RNs interviewed. 24 responses from doctors, 7 out of 13 were interviewed.	Overall, it is favourable to the NP's role to enhance LTCF and improve access to care. RNs concerned about NP roles having a negative impact on their role or taking over doctor's work: potential for role conflict between doctor and NP. Lack of government funding for NP role in LTC. NPs could support complex care in LTC if appropriate funding and collaboration were established.	Small study: 75 RNs responded out of 295 (25% response rate). A limitation of the study might be the words "Doctor collaboration", as this may have influenced the participants' responses. A low response rate may not be representative of wider cohorts. Non-response bias due to a low number of participants.
9. Adams and Carryer (2019)	*n*= 17	Institutional ethnography	NZ (rural)	The study was based on a larger study exploring the establishment of NP services. 13 NPs and 4 NP candidates participated in interviews. All-female, 5 identified as Māori, with 1–8 years of practice as NPs. Worked in various settings: PHC, PHOs, DHBs, trust-owned general practice and Māori health providers across 6 NZ DHBs.	The journey to becoming an NP took 7–15 years, each stage requiring considerable negotiations from a range of organisations. Critical factors in developing NP roles in local areas included support, advanced clinical opportunities, supervision and funding.	Small study: 13 NPs and 4 NP candidates in rural practice may not reflect the entire population.
10. Adams et al. (2020)	*n*=160	Survey	NZ	NPs in NZ working in PHC; 160 out of 224 NPs responded (71.4% response rate).	NPs were evenly spread across NZ, and half were supervising NP candidates. Employment models, models of care and access to diagnostics, particularly radiology, limited practice.	The sample size was estimated at 224 NPs in PHC, as no definite denominator is available. Multiple settings and few NPs; in-depth analysis was not done.
11. Copnell et al. (2004)	*n*=137	Surveys x 2	Australia	Doctors and nurses in neonatal intensive care units (NICUs) in 3 large teaching hospitals in Melbourne about the NP role in NICUs. 1st survey: 62 responses (41% response rate), 15 doctors and 47 nurses. 2nd survey: 75 responses (37.5%) from 16 doctors and 59 nurses.	A moderate collaboration existed between doctors and nurses, indicating room for improvement. Doctors and nurses disagreed significantly on their perceptions of overall collaboration, as well as doctors' interactions with and attitudes towards nurses and doctors' behaviour.	Perceptions of collaboration are subjective and individual experiences. Unable to study the same staff over time to gauge changes in perceptions. Lack of international standards for NP education and practice.
12. Wilson et al. (2005)	*n*= 9	Qualitative descriptive exploratory	Australia (NSW)	9 NPs from NSW: urban, rural, and remote clinics and hospitals. A total of 35 NPs were registered in NSW at the time.	Most NPs reported ineffective collaboration with medical and allied health professionals. Resistance from doctors about losing a number of patients and income. No Medicare rebate to NPs unless consultation was medical. There are more barriers for rural NPs than urban ones. Not being valued or respected by other health workers.	A small sample size of 9 NPs may not reflect the experience of the total population (35).

Article	Sample	Design	Country	Participant characteristics	Main outcome	Limitations/ bias
13. Allen et al. (2005)	*n*=25	Exploratory qualitative evaluation	Australia	Interviews with 15 clients and carers referred to aged care NPs and 10 health professionals.	Positive health outcomes for clients suggest that NPs focus on multiple dimensions of the client — physical, psychological, social and advocacy. Findings from health professionals' interviews showed a high level of interdisciplinary collaboration and teamwork.	A small sample size of 15 clients and 10 health professionals.
14. Turner et al. (2007)	*n*=17	Critical discourse analysis	Australia (rural)	The notion of NP autonomy is to explore policy documents and compare them with the experiences of NPs.	NP role was not accepted as supporting new models of care. The nurse's role remained directed by those with a more dominant influence on decision- and policymaking.	A small sample size of 2 NPs and 15 NP candidates in rural practice.
15. Wand and White (2007)	*n*=21	Qualitative scoping study	Australia	1st of 3 studies: Interviews with MHNPs (15) and 6 senior ED nurses about MHNP in EDs as outpatient service in Prince Alfred Hospital in Sydney.	Support expressed for MHNPs in EDs as an outpatient service. The major challenge identified was the reassurance of medical colleagues, other health professionals and the public about the safety of the new role. NPs must be considered an equal part of the healthcare team.	Small sample size, and consumers, carers and community medical health staff were not involved. Potential for response bias.
16. Wand et al. (2011)	*n*=23	Thematic analysis	Australia	(2nd of 3 studies) Interviews with study participants about MHNP outpatient service in E.Ds.	The study identified distinct therapeutic contributions for patients. NPs must articulate their autonomy as independent practitioners and advanced nurses, not as doctor substitutes.	Small sample size based on one hospital. Potential for response bias.
17. Wand et al. (2011)	*n*=20	Thematic analysis	Australia	(3rd of 3 studies) ED staff interviews- 10 nurses and 10 medical officers with prior involvement with MHNP ED outpatient service.	NPs enhanced the overall service of EDs and met the populations' needs. Validation from the study of the supportive and collaborative function of MHNPs in E.Ds.	A small sample size may not be reflective of the entire population. Potential for response bias.
18. Tori and Morley (2011)	*n*=not stated (75% return rate)	Participant action research/ survey	Australia	NPs, NP candidates and nurses working towards NP roles to establish effective special interest groups in regional Victoria (75% response rate and sample size not stated).	Support was found to be the most important function — for the members and by the members — and organisational support. Factors that might hinder the group's effectiveness were interpersonal relationships, and individual personality types may have influenced problematic communication.	The author stated that it was a small sample study, but the actual number was not stated — only the 75% response rate.
19. Ling et al. (2013)	*n*=48	Survey	Australia (NSW rural)	Senior AOD nurses in rural NSW about becoming NPs. Response rate, 17 (35%), age range 35–52 years, median=47.7 years.	Lack of clarity about the NP role and process and benefits of becoming an NP. All agreed that becoming an NP would improve patient access to healthcare. A lack of support from managers and other health professionals would prohibit progression. Only 6 out of 17 (35%) nurses would consider the NP pathway.	Small sample size in rural regions of NSW, excluding the metropolitan nurses. It may not reflect the total population. Risk of social desirability bias.

Article	Sample	Design	Country	Participant characteristics	Main outcome	Limitations/ bias
20. Jones et al. (2013)	*n*=703	Survey	Australia	Members of Australasian College of Emergency Medicine. 703 responses were received out of 2,868 (response rate, 25%) of E.D. doctors (47.5%) and ED trainees (52.5%).	Poor understanding of the NP role, even those who worked with NPs. 50.8% supported the role, and 20% did not support it. The absence of a core scope of practice was required to facilitate a better understanding and acceptance of the role.	The response rate could not be calculated to establish how many members received the survey. The survey contained double-barrelled questions, and the ability to skip questions was omitted from the analysis. There is no distinction between endorsed NPs and NP candidates.
21. Parker et al. (2013)	*n*= 77	Focus group interviews	Australia	Consumers accepted NPs in PHC for routine visits and less complex conditions. NPs provide more time than doctors for complex cases. Not a replacement of doctors.	Consumers accepted NPs in PHC for routine visits and less complex conditions. NPs provide more time for doctors for complex cases. Not a replacement of doctors.	Consumers had limited experience receiving care from NPs. A small number of NPs practicing in PHC.
22. Westbrook et al. (2013)	*n*=14	Cross-sectional qualitative	Australia	EDs in 2 large metropolitan public teaching hospitals. Interviews with 5 NPs, 4 senior doctors and 5 senior nurses. Following the introduction of the NP role 4 years prior.	All respondents agreed that NPs' practice was more holistic and challenged the traditional medical model of care in E.Ds. Reduction in patient waiting times. Positive influence on nursing peers: empowerment, education, role modelling and career pathways.	Due to a small sample size of NPs in EDs, the study was limited to 2 hospitals.
23. MacLellan et al. (2015)	*n*=10	Qualitative ethnography	Australia	3 interviews with NPs over 12 months at various sites in metropolitan, rural and remote locations in Australia.	Following 10 years of NP practice in Australia: The challenge of defining role position in practice. Increased acceptance by doctors via gaining respect over time. Senior nurses in positions of power often demonstrated resistance to NP roles.	A small sample of novice NPs.
24. MacLellan et al. (2017)	*n*=10	Summative content analysis	Australia	3 interviews with 10 NPs over 12 months at various sites: metropolitan, rural and remote locations in Australia.	NPs focused on personal factors affecting their transition. Unmet expectations from other health professionals. Intra-professional factors of professional jealousy from nurses. Collaboration and collegiality: NPs worked with doctors to change their perception of the role. Some resistance still existed. Organisational factors: changes to regulatory and legislative requirements.	A small sample of novice NPs.
25. Middleton et al. (2016)	*n*=293	Survey	Australia	Survey of NPs in 2009 and comparison with a study in 2007. 293 responses out of 408 (response rate 76.3%). Approx. half (50.9%) were new respondents.	Suboptimal conditions for NPs and NP candidates. Nil improvements to limitations and enablers were identified 2 years prior. Significant increase in the number of NPs awaiting endorsement.	Some new respondents might have been endorsed during the first survey but did not participate. A high response rate means results are generalisable. Non-respondent bias.
26. Lowe et al. (2013)	*n*=172	Mixed-methods-Phase 1 survey	Australia	Survey of 3 target groups: NPs, Managers, and Nurses in policy. With a response rate of 38%, all Australian states represented the largest group (n=94, aged between 45 and 60 years).	Positive regard for NP role, but support remained ambiguous. Need for role definition and funding. Lack of support from medical and other health professionals. Poor access to MBS and PBS funding; no provider numbers for NPs.	A small number of nurse policymakers. Respondents (4.1%), especially from ACT, South Australia, and Tasmania.

Article	Sample	Design	Country	Participant characteristics	Main outcome	Limitations/ bias
27. Lowe et al. (2018)	*n*=18	Mixed-methods Phase 2 sequential explanatory	Australia	Semi-structured interviews with 8 NPs, 6 Nurse Managers, and 4 Nurse Policy Advisors. Representation from metropolitan, regional, and rural Australia (except ACT).	Affirmation of benefits of NP roles to patients. Organisations continued to struggle with the normalisation of NP roles. Lack of policy and perpetuation of existing organisational cultures. Improvements in teamwork improved patients' journeys. Need for strategic support and funding to implement NP role. Manager is a central figure of support in the reform process.	The study in Australia may not affect the transferability into different health systems. Non-respondent bias.
28. Craswell and Dwyer (2019)	*n*= 1,318	Cross-sectional population survey	Australia	Computer-assisted study of public opinion about the willingness or lack of interest in being treated by NPs as the first contact when accessing healthcare. 1,318 people were surveyed, with an overall response rate of 33%. Australian citizens over the age of 18. All states were represented.	48.6% would always consider seeing NPs, 44.7% would not consider it at times, and 6.7% would never see NPs. "Willingness to see NP" themes emerged: Confidence in governing the health system, time and understanding of the NP role; personal experience, and easing the burden on the health system. Minority (n=80) would never see NPs as they had previously had a bad experience and believed doctors and nurses were fundamentally different.	NP's definition of care provision was given to respondents at the start of the survey, which could have biased the responses. Response bias.
29. Smith et al. (2019)	*n*=20	Qualitative semi-structured interviews	Australia (rural)	15 NPs and 5 secondary informants working in non-metropolitan regions, in PHC, aged care, chronic and emergency, and critical care roles were interviewed.	The NP's scope of practice was constrained by limited healthcare funding. Lack of organisational support for creating NP roles. The role was viewed positively, providing higher levels of autonomy. NP's role was not well understood by the public. Resistance from other health professionals due to not understanding the NP role. NP's qualities, such as diplomacy, negotiation, resilience and advocacy, were essential in gaining acceptance from MDT.	Small sample size and analysis confined to NPs. Non-respondent bias.
30. Plath et al. (2019)	*n*=1656	Descriptive exploratory	Australia	Monitoring NP service in ED from 2005-2018 in Redcliffe Hospital north of Brisbane. 1656 total patient presentations reviewed.	After 13 years of implementation, the NP role had become a stable and reliable workforce with minimal turnover. NPs were expert clinicians within their scope of practice. NPs were sound decision-makers, autonomous yet collaborative. NPs had become an integrated part of the ED team.	A small number of NPs in one hospital.
31. Weinberg et al. (2020)	*n*=60	Cross-sectional mixed methods	Australia	60 anaesthetists out of 100 were surveyed in Austin Health (teaching hospital) in Melbourne to ascertain the attitude and acceptability of the NP model for low-risk colonoscopy patients. 24 participants were interviewed. (60% response).	Most anaesthetists did not support the NP-led model and were unwilling to train and support NPs. Lack of support was due to patient safety, legal concerns and the potential for the programme to be a public liability prone to litigation if an adverse event occurred. Concerns about accountability and prescribing responsibility.	The study was conducted in one tertiary centre, limiting external validity. Possible selection bias and response bias, institutional, and cultural bias as all anaesthetists worked in the same hospital.
32. Clifford et al. (2019)	*n*=27	Mixed methods	Australia	35 NPs in NSW public health service surveyed: 77.5% response rate re NPs' perceptions and support. Variable geographical locations and specialities included.	NPs' perceptions of why their position existed was that they were to address shortfalls. Themes of inequality, inadequate cover and inadequate service. Lack of management, financial and colleague support. NP roles should be more generalised to ensure workforce flexibility.	Study samples from the public health sector only. Private practice NPs were not included. It may not be reflective of the NP population. Respondent bias.

Article	Sample	Design	Country	Participant characteristics	Main outcome	Limitations/ bias
33. Bonner et al. (2020)	*n*=162	Prospective service evaluation	Australia	Integrated evaluation of Chronic Disease NP clinic in Brisbane: common clinical outcomes included patient-reported outcome measures and health service utilisation. 162 patients seen.	NPs contributed to decreasing acute service use by patients with chronic diseases by providing a holistic "one-stop-shop" for multiple comorbidities. Focus on the importance of achieving outcomes for patients. NPs improved health outcomes by providing accessible and coordinated care.	The study only evaluated one NP-led clinic.

Abbreviations. AOD, alcohol and drug; DHB, District Health Board; ED, Emergency Department; GP, General Practitioner; ICU, intensive care unit; MBS, Medical Benefits Scheme; MDT, multi-disciplinary team; MHNP, Mental Health Nurse Practitioner; NP, Nurse Practitioner; NSW, New South Wales; NZ, New Zealand; PBS, Pharmaceutical Benefits Scheme; PEPPA, participatory, evidenced-based, patient-centred process; PHC, primary healthcare; PHO, primary healthcare organisation.

A total of 33 studies were included in the literature review that met the inclusion criteria, as summarised in the literature review matrix (Table 3). Ten studies were published in NZ and 23 in Australia between 2002 and 2022. Most of the studies were a qualitative design (17), seven were surveys, five used mixed-methods, and only four were quantitative studies. The number of participants in NZ research ranged from 13 to 160, and in Australia, from nine to 1,656, and 70% of the studies had a sample size of less than 170 participants. Overall, there was a dearth of quantitative studies about NP practice in Australia and NZ.

Nurse Practitioner Collaborative Practice Research in New Zealand

Ten studies conducted since 2002 investigated NP practice in New Zealand, including four quantitative, three mixed-methods, and three qualitative studies. The research predominantly focused on the NP role in PHC (Adams et al., 2020; Carryer & Adams, 2017; Carryer et al., 2011; Mackay, 2003), DHBs (Pirret, 2008; Pirret et al., 2015), rural practice (Adams & Carryer, 2019; Carryer et al., 2011), residential aged care (Forbes et al., 2018), and NPs in various practice settings (Gagan et al., 2014; Harvey, 2015). Four studies published between 2003 and 2020 used survey-based methods with a median sample size of 89, ranging from 16 to 113 participants (Carryer et al., 2011; Forbes et al., 2018; Gagan et al., 2014; Mackay, 2003).

Three peer-reviewed mixed-methods studies (2014-2018) reported on the 10-year evaluation of NP practice (Gagan et al., 2014), examination of NPs as initiators of new models of care (Harvey, 2015), and GP and RNs' attitudes towards NP roles in long-term aged care facilities (Forbes et al., 2018). The mixed-methods studies' median sample size was 90, ranging from 35 to 113 participants, and used a combination of survey data and focus group interviews (Forbes et al., 2018; Gagan & Maybee, 2011; Harvey, 2015). The three qualitative peer-reviewed studies identifying the rural NP transition workforce challenges demonstrated direct comparisons of equivalence between NP and doctor-led care. They identified barriers to practice for NPs in PHC (Adams & Carryer, 2019; Carryer & Adams, 2017; Carryer et al., 2011). The studies were published between 2011 and 2019 and used several methods, such as thematic analysis of open-ended questions and institutional ethnography.

The themes in the NZ literature focused on substituting medical services, cost comparison, safety, and differences in NP service. To justify the quality and safety of NP services when compared to medical services, further research was conducted, which was vital in reassuring the public about NP safety and was also considered an essential part of the history of NP development (Carryer & Adams, 2017; Martínez-González et al., 2015; Pirret et al., 2015).

The earliest research in 2003 examined the perceptions of Northland DHB GPs regarding the NP role. The study was published in the New Zealand Medical Journal. It was adapted from the - "Survey of General Practice Physicians' Opinions Concerning the Family Nurse Practitioner"- which was initially developed in the United States in 1975. From the survey responses of 50 GPs, representing a response rate of 46.3%, the findings revealed a

generally favourable view towards the NP role. However, there was a notable lack of understanding about the full scope of NP practice, with specific concerns raised regarding prescribing practices, competence, and knowledge base. The study identified funding as a significant challenge. General Practitioners relied on the fee-for-service funding system for part of their income and expressed concerns about the time required for supervision and consultation with NPs (Mackay, 2003). It is essential to acknowledge that this study had a potential risk of non-response bias, as only 50 GPs participated, and its geographic limitation to Northland may restrict the generalisability of the findings to the entire GP population in NZ.

Pirret (2008) conducted a comparative study of NP-led critical care outreach services (CCORS). The author explored the newly implemented role of the Intensive Care Unit (ICU) NP within the context of CCORS and emphasised the significance of advanced nursing knowledge and skills in promptly identifying patient instability and implementing timely interventions to improve patient outcomes. In the study, 133 patients were admitted to CCORS, and an encouraging 90% (n=120) of them demonstrated clinical improvement and were successfully discharged. The Nurse Practitioner relied on their clinical judgement, consideration of the patient's condition, and the availability of ward resources to determine appropriate discharge criteria. Notably, the implementation of NP-led CCORS resulted in a substantial reduction in ICU readmissions, decreasing from 28 cases before the service implementation to only nine after the implementation. These findings underscore the positive impact of NP-led CCORS on patients' health outcomes and highlight the pressing need for further development of NP positions within the ICU setting. Moreover, the study's outcomes emphasise the need for more robust research into the specific roles and contributions of ICU NPs to better inform healthcare practices (Pirret, 2008). The study limitations were a low number of referrals received by NPs, with clinics restricted to three per week, which might have impacted the statistical analysis.

A subsequent comparative research study conducted in 2011 by Pirret et al. (2015) aimed to compare the diagnostic abilities of 30 NPs' and 16 doctors in managing the first-time presentation of complex cases in specialities of older adults, EDs, PHC, cardiology, respiratory and palliative care. According to the assessments made by a panel of experts, 61.9% of doctors correctly identified the diagnosis, 56.3% identified the problem, and 34.4% determined the appropriate actions. In comparison, NPs achieved 54.7% accuracy in diagnoses, 53.3% in problem identification, and 35.8% in determining the actions. Further analysis revealed no statistically significant difference between the diagnostic reasoning abilities of NPs and doctors. The study concluded that there was no discernible difference between NPs and doctors in their diagnostic reasoning abilities when analysing complex patient cases, demonstrating a positive collaborative impact of NPs within healthcare teams. It is important to note that the study was underpowered due to the low number of doctors (16) involved when performing independent t-tests between two groups (NPs and doctors).

Rural locations in NZ are grappling with a shortage of health workers, especially doctors, and an imminent depletion further compounds this issue due to retirements, which will escalate the pressure on the healthcare system. Three qualitative studies conducted between 2011 and 2019 shed light on the challenges NPs and NP candidates faced in rural practice (Adams & Carryer, 2019; Carryer & Adams, 2017; Carryer et al., 2011). These studies employed various methodologies, including a qualitative descriptive survey, exploratory research, and focus group interviews, with a median sample size of 17 participants and a range between seven and 13 participants. The earliest study by Carryer et al. (2011) revealed that a lack of understanding of the NP role and insufficient support from medical professionals and nursing colleagues discouraged many NP candidates from considering an endorsement. Moreover, numerous legislative and funding barriers were identified, notably the lack of authority to order laboratory tests and the absence of employment opportunities for rural NPs. The challenges posed by working in isolation in rural settings made it difficult for NPs to demonstrate competence in meeting NP practice portfolio requirements, including showcasing leadership opportunities, influencing practice at both local and national levels, and conducting scholarly research inquiries into nursing practices.

Consecutive studies by Carryer and Adams (2017) and Adams and Carryer (2019) demonstrated that NPs excel in providing comprehensive person-/family-centred care that considers the individual and their family's needs. Their ability to address patients seamlessly and collaboratively in their broader context highlights the potential for integrated care delivered by a functional MDT. Despite these positive findings, barriers persisted in NP practice, such as a preference for medical solutions over person-centred care and the lack of funding for NP roles. These challenges hindered the full transformative potential of the NP role.

The Nurse Practitioner role in NZ was evaluated by three mixed-methods studies conducted by Forbes et al. (2018), Gagan et al. (2014) and Harvey (2015). These studies explored various aspects of NP practice, including the initiation of new care models, the impact on patient access to healthcare and the attitudes of RNs and GPs towards NPs in long-term care aged care facilities. An evaluation study by Gagan et al. (2014) conducted in 2012 demonstrated the efficiency of NPs and the measurable improvements they brought to health outcomes. Surveys based on the PEPPA (Participatory, Evidence-based, Patient-centred Process) model revealed positive effects such as decreased polypharmacy, reduced waiting times, fewer *Mental Health Act* uses, fewer after-hours visits, reduced violence in delivery settings, fewer hospital readmissions, and decreased relapses of chronic illnesses. With a substantial number of NP respondents (n=76), the study concluded that NPs played a valuable role in producing measurable benefits for the healthcare system and patients. However, the study acknowledged certain limitations, including a lack of control over the data collected and possible response bias due to a lack of support for the system where some NPs worked.

The evaluation study (*n*=35) by Harvey (2015) further emphasised the emergence of primary healthcare as a broader scope of practice rather than a narrow, disease-specific focus for NPs. However, geographical and organisational factors continued to impact NP practice. The study found that only 78% of budgets included designated funding for NP role development, and the NP role was sometimes treated interchangeably with medical officers or RNs, indicating inequities in position entitlements. The study encountered limitations due to a low number of respondents, with only 35 out of 66 participating in the survey. Consequently, the findings were at risk of non-response bias, potentially not providing a comprehensive representation of the NP population at the time.

Forbes et al. (2018) conducted a descriptive mixed-methods study by conducting interviews in long-term care facilities to investigate the perspectives of GPs (*n*=24) and RNs (*n*=75) regarding NPs. The study revealed a positive attitude towards NPs, with participants recognising their potential support in the increasing needs of older adults in aged care. However, the respondents' limited or non-existent interaction with NPs resulted in a lack of clarity about the NP role, potentially impacting the study's ability to generalise findings to broader cohorts. In their analysis, the authors identified several challenges associated with an ageing population, workforce, and declining GPs in NZ. These factors are expected to directly impact the ability of aged care facilities to provide specialised gerontology care. Furthermore, the financial environment was found to be inadequate in addressing the complex and evolving needs of residential care profiles. Given the context of long-term residential aged care settings, NPs' scope of practice has the potential to support these changing needs by facilitating collaborative funding and employment arrangements to coordinate care across multiple service providers.

To summarise, this review included 10 NZ studies conducted since 2002 and examined various aspects of NP practice. These studies focused on patient satisfaction, on defining the NP role, and on healthcare professionals' understanding of this role. The studies also aimed to identify barriers to NP practice. The studies are categorised as follows: three studies studied the NP role in PHC (Adams et al., 2020; Carryer & Adams, 2017; Mackay, 2003); two studies investigated high-dependency care and public hospitals (Pirret, 2008; Pirret et al., 2015), two studies focused on rural practices (Adams & Carryer, 2019; Carryer et al., 2011), two studies followed a mixed-method research design (Gagan et al., 2014; Harvey, 2015) and one study investigated specifically the residential aged care setting (Forbes et al., 2018).

Between 2003 and 2020, a collection of five quantitative studies (Adams et al., 2020; Gagan et al., 2014; Mackay, 2003; Pirret, 2008; Pirret et al., 2015) delved into various aspects of NP practice, with median sample sizes of 89 and participant numbers ranging from 16 to 160. Alongside these, three mixed-methods studies conducted from 2014 to 2018 addressed significant areas in NP practice evaluation (Gagan et al., 2014), including the role of NPs as initiators of new care models (Harvey, 2015) and the attitudes of doctors and RNs towards the NP role in long-term aged care facilities (Forbes et al., 2018). Despite the valuable insights

provided by these studies, it should be noted that the quantitative research faced limitations due to being underpowered, which resulted from the relatively small number of participants. Consequently, the small sample size might have impacted the generalisability of the findings. Moreover, the mixed-methods studies offered unique insights into the multifaceted nature of NP practice, providing a more comprehensive understanding of the NP role and its impact on various healthcare settings.

The three qualitative studies addressed distinct aspects of rural NP practice. Carryer et al. (2011) aimed to identify the challenges the rural NP transition workforce faced, while Carryer and Adams (2017) focused on demonstrating direct comparisons of equivalence between NP- and doctor-led care. Adams and Carryer (2019) aimed to identify the barriers to practice for NPs in rural PHC. All three studies exhibited methodological rigour. However, they were limited by small sample sizes Carryer et al. (2011) with 70 participants; Carryer and Adams (2017) with 13 participants; and Adams and Carryer (2019) with 17 participants, which may not fully represent the entire NP population. Nevertheless, the authors of these studies have high credibility, qualifications, and expertise in nursing and the area of NP practice. Common themes across these qualitative studies include the lack of organisational support (both managerial and collegial), insufficient government funding, and legislative barriers.

Numerous studies conducted in NZ have consistently identified several vital themes since 2002. One such theme is the lack of understanding of the NP role, particularly among healthcare professionals and especially within the medical profession. Additionally, inadequate organisational support has led to resistance and lack of support, significantly impacting the development and progression of the NP role. Studies in NZ focusing on collaborative practice for NPs have highlighted its positive impact on various patient health outcomes, such as reducing acute care readmissions and improving healthcare access. However, despite extensive research since 2002, no evidence has been found to indicate that organisational opportunities exist for NPs, especially having autonomy in making decisions about their clinical practice. The present research aims to fill this knowledge gap.

Nurse Practitioner Collaborative Practice Research in Australia

Themes in Australian literature related to NP practice included exploring various aspects of NP practice across multiple practice settings and geographical locations. Studies have highlighted that healthcare professionals, especially medical practitioners and healthcare consumers, did not understand the NP role. Additionally, barriers to practice as an NP and NP candidates resulted from insufficient organisational support and a lack of funding.

The following review includes 23 studies meeting the inclusion criteria conducted in Australia concerning NP collaborative practice and support since 2002. Qualitative research dominated (n=13), followed by six quantitative studies and four mixed-methods studies conducted since 2015. Ten studies were published in the first decade of NP practice in Australia, with four following a quantitative research design and six following qualitative

research designs. These studies focused on emergency departments (EDs) and rural communities.

A four-year evaluation of the Mental Health Nurse Practitioner (MHNP) role in EDs in an outpatient service at Prince Alfred Hospital in Sydney began in 2007 with a scoping study to establish the feasibility of the MHNP service (*n*=21). This study focussed on confirming the NP skill base, assessing the available infrastructure, identifying the target population, and showing outcome measures to evaluate the effectiveness of the proposed new service. The MHNP service project was initiated in response to the updated Australian *National Action Plan on Mental Health (2006-2011)*, which emphasised the government's commitment to developing mental health services, promoting mental health, preventing illness, and supporting rehabilitation and recovery. The plan proposed new models of care designed to address the population's diverse needs. Participants supported the MHNP role during the scoping study, particularly within a primary prevention framework and mental health promotion, targeting individuals with undifferentiated mental health problems. The focus was on providing care to ED patients with specific symptoms and behaviours rather than limiting care to specific diagnostic groups. However, the authors acknowledged that introducing NP roles in Australia would require efforts to reassure medical colleagues, the MDT, and the public about the ability of NPs to deliver high-quality PHC. To effectively implement the MHNP service model, NPs must be considered an equal part of the healthcare team (Wand & White, 2007).

The next phase of the MHNP outpatient service study conducted by Wand et al. (2011a) involved a thematic analysis of interviews and survey responses from study participants (*n*=23) between December 2009 and March 2010. The results from the participant evaluation phase indicated strong support for the MHNP role in EDs. Two main themes emerged: (1) therapeutic dimensions of MHNP service and (2) practical and timely access to follow-up. Participants expressed feeling comfortable and reassured, leaving their appointments with increased hope. The MHNP's distinct therapeutic contribution was evident, as nurses had a unique ability to establish intimacy and informality with patients, which was specific to the nursing profession. Participants described a focus on health promotion and solutions rather than a problem-oriented approach, leading to a more positive perception of their ability to manage their symptoms. The therapeutic use of self was integrated into a mental health nursing theoretical framework, fostering a human-to-human connection between the NP and the patient. The quantitative findings from the evaluation complemented and informed the qualitative data provided by the participants. The survey consisted of two short self-reported pre- and post-measures: the K-10 measure of psychological distress and the General Self-Efficacy Scale. A satisfaction questionnaire was included. For patients who responded to the survey, there was a statistically significant improvement on all items of the K-10 scale, and the study identified a modest negative association between psychological distress and self-efficacy. The authors emphasised the importance of NPs establishing themselves as nurses, not as doctors or doctor substitutes,

but as independent practitioners with a unique approach to healthcare. NPs needed to articulate their autonomy as practitioners to be recognised as independent health service providers (Wand et al., 2011a). The study was constrained by a small sample size and its limited scope to a single hospital, potentially making it less representative of the broader NP population.

In 2009, Jones et al. (2013) conducted a survey to explore the benefits, support, and limitations of the NP role in EDs. The survey was distributed to all Australasian College of Emergency Medicine members. The questions were collaboratively designed by a senior ED registrar and three ED NPs. The response rate was 25%, resulting in a sample size of 703, with a nearly equal representation of 47.5% ED physicians and 55.9% trainees. Respondents' ED experience varied, with 55.9% having one to five years of experience, 2.6% with six to nine years, 12.1% with 10 to 14 years and 11.4% with more than 15 years of experience. A significant proportion of ED physicians (79.9%) had prior experience working with NPs, and 55.5% reported having NPs employed in their EDs.

Regarding the support for the NP role, 50.8% of study respondents responded positively, while 20% responded negatively. The study identified a lack of clarity about the NP role and the absence of a core scope of practice as critical factors influencing poor understanding and acceptance of the NP role in EDs. It is essential to note that the study had methodological limitations. Respondents were allowed to skip questions, resulting in a variable response rate for each question. Additionally, no clear distinction was made between an NP and an NP candidate, potentially leading to confusion among participants about the differences (Jones et al., 2013).

Between 2007 and 2019, six studies were published related to NPs' rural practices. It consists of four qualitative, one quantitative, and one mixed-methods study. The median sample size was 20, ranging from 10 to 48 participants. Among these studies, three rural-focussed studies were conducted by Clifford et al. (2019), MacLellan et al. (2015) and MacLellan et al. (2017). These studies explored the transition of RNs to NPs in Australia and critically examined issues and concerns of the NPs during their first year of practice. They investigated the support required for further development of the NP role.

The first phase of an ethnographic study conducted by MacLellan et al. (2015) explored the medical acceptance of the NP role, explicitly focusing on the NPs' first year of practice. Novice NPs expressed concerns about the lack of clarity in their scope of practice and emphasised the importance of educating other clinical team members about the NP role. Interestingly, the study found that improved communication and inclusivity by nursing colleagues and MDTs were not deemed essential to the success of the NP role, contrary to initial expectations. The narratives collected from the study highlighted a positive trend of growing acceptance of the NP role among medical professionals, in contrast to previous research findings. This acceptance was achieved through fostering mutual respect, involving NPs actively in patient care, and being responsive to stakeholder feedback. However, the study also

identified reluctance to support the NP role, particularly among senior nurses in authoritative positions, especially those who transitioned from a nurse specialist role within the organisation (MacLellan et al., 2015).

The findings were further explored in the consecutive summative content analysis study (*n*=628) conducted over 12 months by MacLellan et al. (2017). The study involved interviewing novice NPs at various sites in metropolitan, rural, and remote locations throughout Australia. The findings highlighted that newly registered NPs primarily focused on personal factors affecting their transition from RN to NP (40% of participants=251). These factors included feelings of insecurity, inability to meet the requirements of the new role, and lack of confidence in their clinical skills. The study also identified the impact of organisational factors (29% of participants=184), interprofessional factors (17% of participants=111), and intra-professional elements (14% of participants=88). The most unmet expectations reported by new NPs were seemingly unrealistic and unachievable expectations from medical and allied health colleagues and senior nurse managers. This led to turmoil for new NPs, resulting in a loss of confidence in their abilities and feelings of failure, ultimately causing some NPs to leave their positions.

Additionally, intra-professional factors, such as professional jealousies and sabotage among nurses, significantly impacted the NP transition. The theme that illustrated the lack of support from nurses during a competition for limited NP positions was labelled “We eat our own”. This referred to the “tall poppy” concept, where successful individuals may face ridicule or criticism from others due to jealousy. As the highest qualified nurses in clinical practice, NPs stood out in nursing, sometimes leading to negative or unsupportive behaviour from their colleagues. Many NP participants reported feeling powerless and ill-equipped to navigate their complex and, at times, hostile work environments. However, the study also highlighted positive efforts by NPs to change medical staff perceptions about their role; through collaborative practice and efforts to improve patient health outcomes, attitudes from medical and allied health professionals began to change and improve (MacLellan et al., 2017).

The earliest qualitative study conducted by Wilson et al. (2005) in rural and remote New South Wales (NSW) explored contemporary collaborative experiences of NPs providing care with GPs and allied health professionals. The study revealed that most NPs experienced only partial collaboration due to resistance from doctors concerned about the potential loss and subsequent reduction in income. This was exacerbated by the fact that in 2005, Medicare did not provide a rebate to patients unless a doctor conducted the consultation, presenting additional challenges. A strong theme from the study was the lack of understanding of the NP role and the absence of respect from other health professionals. These factors contributed to dissatisfaction with working within ineffective collaborative relationships. However, despite the challenges, NPs remained determined to continue providing advanced nursing care for patients and establish and collaborate with other health professionals (Wilson et al., 2005).

The challenges of rural NP practice (*n*=17) were outlined in a critical discourse analysis conducted by Turner et al. (2007). The study highlighted the use of public media by the Australian Medical Association (AMA) to undermine the first NP in remote NSW, referring to them as a "bush doctor", which was deemed a derogatory connotation. The media often portrayed NPs as mere nurses, disregarding their status as autonomous health professionals. The authors suggested that the AMA's political motives and discomfort with professional boundaries brought the role of NPs into the public arena, overshadowing the actual value of NPs. This was evident through claims that NPs would "dumb down" the Australian healthcare system. However, the debate failed to recognise that remote communities have traditionally relied on a nurse as the primary point of entry to access health services, with phone support provided by the Royal Flying Doctor services.

The lack of support for NPs from managers and other healthcare professionals persisted, as evident in a survey conducted in 2008 focusing on rural New South Wales. The survey targeted senior alcohol and drug (AOD) nurses (*n*=17) considering endorsement to become an NP and revealed various challenges in their practice. In alcohol and drug treatment, NPs provide collaborative and innovative expertise, support, and treatment for patients with substance use disorders, therefore enhancing the care received from the MDT team. The study's authors reported a lack of clarity about the NP role (over 50% of participants). Despite this lack of clarity, all nurses surveyed agreed that attaining NP status would improve patient access to care and treatment, with extended consultation times and little impact on medical or other allied health positions (Ling, 2007). The study was limited by a small sample size, excluded metropolitan-based nurses, potentially not reflecting the entire population, and was at risk of social desirability bias.

The second decade of NP collaborative research in Australia began with a two-phase mixed-methods study by Lowe et al. (2013). The aim of the first survey phase (*n*=172) was to explore perceptions of the integration of NP roles in healthcare settings regarding support, positive regard, and sustainability from the viewpoints of NPs, managers, and nurse policymakers. The second qualitative phase (*n*=18) aimed to determine the participants' perceptions about the integration of NPs using a sequential explanatory design. The semi-structured interview protocol was based on the themes identified in phase one of the quantitative study.

The first phase of the mixed-methods study by Lowe et al. (2013) involved a quantitative survey of three target groups: (1) NPs, (2) nurse managers, and (3) those involved in advising about nurse policy. The authors developed a survey based on the findings from the literature review. A total of 172 questionnaire responses were received, with NPs accounting for 51.7% of the responses, nurse managers 44.2%, and nurse policymakers 4.1%. The participants represented all Australian states, with the majority aged between 45 and 60 years (*n*=94) and the

next largest group aged between 31 and 44 (*n*=57). Most respondents (*n*=131) had more than 16 years of nursing experience, and some (*n*=112) had 20 years or more experience.

The study's results indicated positive regard for NP roles (*n*=116), but support for the role remained doubtful, as 92 respondents agreed that there was support for NPs, while 43 respondents disagreed. All participants agreed that the NP role had clear benefits and identified a need for increased funding for NP positions and medical support for the roles to support implementation. Access to national government funding through the Medical Benefits Scheme (MBS) and Pharmaceutical Benefits Scheme (PBS) was identified as crucial to the ongoing viability of NP roles in various practice settings. NPs faced limitations in claiming MBS reimbursement for their services since they did not have the provider numbers like doctors, resulting in consumers having to pay out of their pockets for many services provided by NPs. The financial barrier affected the viability of NPs in private or PHC settings (Lowe et al., 2013).

The second qualitative phase of the mixed-methods study by Lowe et al. (2018) involved conducting semi-structured interviews. It was conducted from May 2011 until September 2012 across Australian states and territories, excluding the Australian Capital Territory (ACT). The study included eight NPs, six nurse managers, and four policy advisers, resulting in 18 participants. These participants represented Australia's metropolitan, regional, and remote areas. The study reported several key findings: (1) recognition and affirmation of the benefits of the NP role, recognition of advanced nursing skills and the ability to meet complex needs of patients effectively; (2) ongoing struggles for organisations with the normalisation of NPs, leading to underutilisation of the role; (3) identification of barriers to the integration of the NP role, including the lack of policy changes and the persistence of medical dominance and hierarchical organisational cultures. The benefits identified included the reduction of healthcare burdens by improving access to healthcare for the older and Indigenous people in remote areas, disability and mental health services, and vulnerable populations. Participants concluded that NPs played a vital role in improving communication and coordination of complex patient needs, leading to systemic improvements and more effective teamwork, ultimately resulting in improved patient journeys.

The study highlighted that managerial support for NPs was critical to the organisations' success, leading to improved patient services. Key support factors included funding, and a coordinated strategic approach would implement NP positions as an integral part of the healthcare team. Managers were recognised as a central figure in the reform process, supporting NPs to practice to the full scope of experience. They were also drivers of change, promoting attitudes towards professional boundaries and turf protection and advancing local and national policies that affected the NP's ability to practice (Lowe et al., 2018).

A three-year prospective new service evaluation in Queensland focused on the Integrated Chronic Disease NP (ICDNP) in 2014. The evaluation examined clinical outcomes, patient-reported outcome measures, and health service utilisation. The Integrated Chronic

Disease NP-led clinic catered to patients with two or more chronic diseases and aimed to support them in achieving their treatment plan goals. The study's findings revealed that after 12 months of attending the clinic, clinical targets for blood pressure and glycaemic control were met. Additionally, there was a significant reduction in body weight (p=.027). The NPs in this study effectively provided accessible and coordinated health services for patients with multi-morbidities, showcasing a model for improved PHC. This demonstrated the valuable contribution of NPs in managing complex health conditions (Bonner et al., 2020).

The increasing pressure on the Australian healthcare system prompted a proposed new NP model to enhance patient care and improve access to services. However, a cross-sectional, mixed-methods study by Weinberg et al. (2020) conducted in Melbourne determined the attitude and acceptability of anaesthetists towards an anaesthesia-led NP model for low-risk colonoscopy procedures and yielded less encouraging results. The study received 60 responses from anaesthetists, with only 35% expressing willingness to train NPs and participate in the alternative service. Most respondents did not support the proposed model of an anaesthesia-led NP for patients with low-risk colonoscopies. They cited concerns about perceived compromised patient safety and potential violations of guidelines on procedural sedation. It is important to note that the study had certain limitations, such as selection and low response rate, and was conducted in a single teaching hospital, thereby limiting the generalisability of the findings.

The perceptions of healthcare consumers regarding NPs were explored in a qualitative study in 2010 by Parker et al. (2013) conducted by the Healthcare Consumers Association in five states and territories in Australia in various community locations. Seven focus group interviews (n=77) were conducted with the public, covering topics such as knowledge and definition of the NP role, experiences of NP-led care, and the use of NPs in PHC. Despite the consumer participants having minimal experience receiving care from NPs, the results indicated general acceptance of NP care for routine visits and managing less complex conditions. The study found that much of the acceptability was based on their perceptions of nurses being "people persons", caring, trustworthy, and providing extended consultations. Yet, Nurse Practitioners were not seen as replacements for GPs.

Five years later, in 2015, a cross-sectional population-based survey study by Craswell and Dwyer (2019) used computer-assisted interviewing to elicit public opinions on the willingness or lack of interest to be seen by NPs as the first point of contact when accessing PHC services. This study was significantly larger (n=1,318) and included the adult Australian citizen population across all states and territories. The participants were married or de-facto (66.5%), with a mean age of 52.6 years (SD 17.96; range 18 to 101 years), with 75% born in Australia. Most respondents (98.1%) had completed high school education, with 44.2% having completed university or higher education. The overall response rate was 33%. Data was collected from calls randomly placed to Australian households. Ten questions and responses were analysed using summative content analysis.

The results from respondents who provided at least one reason why they would always consider seeing NPs identified several themes: (1) confidence in the governing of the health system; (2) time; (3) understanding of the NP role; (4) personal experience; and (5) ease of burden on the health system. Almost the same number of participants would consider seeing an NP (48.6%) compared to those who would not consider seeing an NP (44.7%), and a minority of 6.7% would never see an NP as they would only see a doctor because they believe that nurses and doctors were fundamentally different. The situations described by survey respondents who would not consider seeing NPs were categorised into the following categories: (1) perception of the severity of the situation; (2) specific health conditions; (3) practitioners requiring knowledge for diagnosis; and (4) consumer choice (Craswell & Dwyer, 2019). The limitation of the survey was potential response bias since a definition of care provision by NPs was provided to the participants before the start of 10 questions and before asking the final questions, as reported in the study.

To summarise, the review included 23 Australian studies conducted since 2002, examining various aspects of NP practice. Similar to the research in NZ, these studies have focused on NP-led services across multiple practice settings, exploring patient satisfaction and health outcomes. Moreover, these findings have highlighted that healthcare professionals and consumers demonstrated a lack of understanding of the NP role. Additionally, there was insufficient funding and legislative support, which created barriers to NP practice.

The Australian studies were dominated by 13 qualitative studies (Allen & Fabri, 2005; Li et al., 2013; MacLellan et al., 2015, 2017; Parker et al., 2013; Plath et al., 2019; Smith et al., 2019; Tori & Morley, 2011; Turner et al., 2007; Wand & White, 2007; Wand et al., 2011a, 2011b; Wilson et al., 2005). However, all the qualitative studies included in the review had small sample sizes with fewer than 25 participants, making them less reflective of the studied population.

On the other hand, seven quantitative studies (Bakker & Demerouti, 2014; Bonner et al., 2020; Copnell et al., 2004; Craswell & Dwyer, 2019; Jones et al., 2013; Ling et al., 2013; Middleton et al., 2016), and four mixed-methods studies (Clifford et al., 2019; Lowe et al., 2018; Lowe et al., 2013; Weinberg et al., 2020) were conducted since 2015. While the mixed-methods studies contained methodological rigour, they were limited by small sample sizes, ranging between 18 and 172 participants. Nevertheless, the studies were an essential platform for future research about NP roles and their significance for healthcare outcomes.

Despite more than 20 years of NPs practicing in Australia, the research on NP-led services is limited, primarily due to the medically dominated healthcare system that opposes nurse-led services. In this system, advanced practice nursing roles are only supported if under the direction of a medical practitioner. Many innovative NP-led services in Australia are not formally evaluated or documented in the literature (Douglas et al., 2018).

Research on NP-Led Practice in Australia: Advancement and Outcomes

Research related to NP-led practice is vital for advancing NP practice, demonstrating positive patient outcomes, and addressing the challenges in the healthcare landscape. It is crucial to recognise and integrate NPs as valuable healthcare team members (Currie et al., 2022; Douglas et al., 2018).

Nurse Practitioner-led health services in Australia were highlighted in a systematic review by Jennings et al. (2015), which identified 1,013 global studies related to the impact of an ED NP role on cost, quality of care, satisfaction, and waiting times. Increasing pressures in the EDs in Australia led to the rapid uptake of emergency NPs as an innovative model. The systematic review aimed to provide updated research in line with the changing domain of delivering health services in ED. The measurement of patient care in the ED was deemed to be one of the most valuable service indicators in Australian health services. Of 1,013 studies, only 14 papers met the inclusion criteria, while the remainder were excluded due to poor methodological quality. Jennings et al. highlighted that the quality of care was poorly defined in the included studies. They nonetheless concluded that NPs could positively impact the quality of care, patient satisfaction, waiting times, and improved patient access (Jennings et al., 2015). Only one study by Dinh et al. (2012) utilised the quality of care as an outcome measure. The systematic review provided narrative findings of the positive impact of emergency department NPs on service provision; however, a significant limitation of the study was a lack of an operational definition of the NP role. The inability to differentiate emergency department NPs from other advanced practice nursing roles internationally leads to confusion and prevents accurate cross-border comparisons.

Other research demonstrated that NPs reduced the utilisation of acute care services. For example, a study by Borbasi et al. (2011) in 20 aged care facilities in Queensland, which focused on a dementia outreach service led by NPs, reflected positive patient outcomes, reduced stress among staff, and decreased admissions to acute sector services (Borbasi et al., 2011). A pilot service in the rural region of Queensland explored the provision of NP-led and GP-supported palliative and end-of-life care services. It involved 62 patients at the end of their lives and without non-malignant disease. The findings indicated that NP-coordinated palliative care in rural communities enabled integrated care, potentially reducing hospitalisations and allowing patients to spend their last days at home. The model benefited rural palliative patients by improving communication between health professionals, increasing patient and caregiver confidence, and enhancing symptom management (Mitchell et al., 2016).

The twenty-one years of Australian research on NP-led services were summarised by Currie et al. (2022), who compared earlier studies to more recent research. The early NP research compared the NP role to that of medical practitioners, especially in EDs. In contrast, more recent research highlighted how NP practice had positively improved patient waiting times, quality of care, symptom management, and overall healthcare consumer satisfaction. NPs

did not replace medical practitioners but contributed to improving the care provided to the population across various practice settings. While this research was essential in establishing a foundation and support for NP practice, there were certain limitations. Specifically, there was limited research on NPs' impact on improving access to health services for vulnerable populations, including the use of telehealth in vast and remote parts of Australia during the COVID-19 pandemic. The authors recommended that future research focus on understanding and testing the value of NPs in providing accessible healthcare, particularly for rural, culturally diverse, and marginalised communities (Currie et al., 2022).

A Comparative Look at Nurse Practitioner Roles in Australia and New Zealand

The Nurse Practitioner role in Australia originated with a similar intent and comparative scope of practice, education, and registration requirements as required for NPs in NZ. The Nurse Practitioner role was implemented in both countries in 2000, and NPs began practicing in 2001. The original intent of the NP role was to enhance access to health services, especially for rural and marginalised communities, and to provide PHC service through independent practice (Appel & Malcolm, 2002). As of 2022, there are 2,447 registered NPs in Australia, representing 0.7% of the total RN population (Nursing and Midwifery Board of Australia, 2022). In contrast, NZ had 656 NPs registered, accounting for 1.2 % of the RN workforce (Nursing Council of New Zealand, 2023), indicating a faster growth of NPs in NZ.

The significant difference in the growth of NP numbers between the two countries can be attributed to the more restrictive nature of NP practice in Australia. In Australia, NPs practicing in community health and PHC settings must collaborate with a medical practitioner and cannot work independently. Moreover, their access to Australia's national health insurance scheme (Medicare) is limited to four time-based face-to-face consultations, with restricted access to pathology and radiology services and certain medications. A national NP survey conducted in 2015 revealed that NPs could not complete full patient care episodes due to these restrictions, rendering the model financially unsustainable (Currie et al., 2019). Consequently, even after 20 years, the vision of NPs in Australia practicing as independent and autonomous PHC practitioners has not been fully realised, and most NPs practice in public hospitals and EDs (Currie et al., 2022). This is despite the fact that research has shown that NPs can effectively contribute to patient care and improve outcomes through both independent and collaborative practice (Adams & Carryer, 2019; Bonner et al., 2020; Gagan et al., 2014; Harvey, 2015; Lowe et al., 2018; Wand et al., 2011b).

Nurse Practitioners' Success Through Collaborative Practice and Team Support

Collaborative practice and collegial support are crucial factors that contribute to the success and effectiveness of NPs in delivering high-quality healthcare. An Australian study by Smith et al. (2019) explored barriers and enablers to rural NP practice. The study involved interviews with 13 NPs, two NP candidates, and seven colleagues of the informant NPs. At the

micro- level (daily practice), NPs faced challenges related to a lack of understanding of the NP role by health professionals, leading to a lack of support for NPs. The NP role also challenges medical practitioners' traditional professional status and hierarchy. To navigate these challenges, NPs demonstrated their professional competence and capabilities, including diplomacy, negotiation, resilience, and advocacy skills. These qualities played an integral role in gaining acceptance from colleagues and supervisors. The study highlighted that at the micro-level, the NP role was most effective when supported by nursing, medical and allied health colleagues with mutual trust and understanding of each other's roles (Smith et al., 2019).

Successful nurse-led services identified communication and collegial support as two of the eight essential factors for success (Dellagiacoma, 2007). Engagement in interprofessional practice was thought to depend on three elements: professional relationships, shared decision-making, and communication. In a survey conducted by Hurlock-Chorostecki et al. (2015), 149 NPs in Canada working in various healthcare settings were assessed. The study identified the importance of building trust among health professionals regarding NP competency and actions to avoid any perception of opportunism. Trust was crucial in creating space for NP roles, enabling role overlap with medicine, and increasing NP credibility and value. Collaborating with other healthcare providers allowed NPs to work effectively, ensuring patients received the best possible care. Consequently, this can lead to improved patient outcomes and higher satisfaction with the health service (Hurlock-Chorostecki et al., 2015).

However, the review indicated that research on collaboration and support from other health professionals is limited, especially regarding the extent of NP decision-making latitude. The present study aims to address this gap by obtaining a representative sample of NPs and explicitly focusing on organisational opportunities to support and enhance the decision-making latitude of NPs.

Summary

The literature review regarding NP practice in NZ and Australia reveals a common theme related to a lack of understanding of the NP role among medical and other health professionals, managers, and healthcare consumers. This lack of understanding has led to resistance from other health professionals and a subsequent lack of organisational support from colleagues and managers. In New Zealand, delays in further NP development were attributed to inconsistent national workforce planning, implementation, and evaluation of the role (Adams & Carryer, 2019). Moreover, the Manatū Hauora has been criticised for its lack of drive, promotion, and commitment to the NP role, including the absence of a clear vision, accessible training programmes, and establishment of roles based on the country's healthcare needs (Harvey, 2015). It is worth noting that the NP role offers much more than just a substitute for a medical approach to practice, and it has the potential to bring about positive changes and improvements in healthcare delivery in NZ (Carryer & Adams, 2017). My NP clinical work

undertaken since the beginning of the current doctoral study suggests that these difficulties remain despite the passage of time and this study addresses a gap that continues.

The literature review highlights a notable lack of quantitative research, with 70% of NZ quantitative studies having small sample sizes, typically fewer than 46 participants. This limitation reduces the reliability and generalisability of the results, potentially hindering the ability to detect significant findings even if they exist (Field & Wilcox, 2017). Additionally, the review identified minimal evidence regarding organisational opportunities for NPs. Furthermore, there was no evidence of research conducted since 2002 to examine whether organisational opportunities exist for NPs to have autonomy in making decisions about their clinical practice.

Therefore, this study aims to explore whether organisational opportunities exist for NPs, such as supervisory and collegial support, that influence their freedom to make decisions about practice and whether the geographical location of Nurse Practitioners plays a role. The next chapter describes the research methodology used to address the study's aim, research questions, and theoretical model. Additionally, it will include the history and validation of the JCQ used in nursing studies related to this field.

Chapter Three: Theoretical Model

Introduction

This chapter describes the research paradigm and the theoretical model underpinning the research, namely the "role control and support" theory. The history of the theory since its inception in 1979 by Robert Karasek will be outlined, followed by a summary of the extensive research conducted in the last 10 years that focused on the population of nurses in various countries.

Research Paradigm

This research is situated within a post-positivist paradigm, which emerged from a comparative study between the natural and social worlds (Scotland, 2012). The post-positivist paradigm adopts methods such as experiments, trials, or surveys. Its core belief is in the replicability of positivist research, asserting that different researchers conducting the same analysis can achieve similar results (Grant & Giddings, 2014). My decision to adopt the post-positivist perspective was primarily influenced by the lack of high-quality quantitative studies about NP practice highlighted in the literature review. Previous research in this area suffered from certain limitations, prompting the adoption a more rigorous and replicable research approach.

The origin of post-positivism can be traced back to the 20th century, emerging as a response to the limitations of the positivist approach, which primarily focused on explaining cause-and-effect relationships through validation or falsification of theories and hypotheses using chosen methods. Post-positivism recognises the complexities of human behaviour and the challenges of achieving complete objectivity and impartiality in research (Davies & Fisher, 2018). Central to the post-positivism ontology is acknowledging an external reality that can be studied and understood through scientific inquiry. However, it is recognised that direct access to this reality is not always possible, leading to multiple perspectives and truths. Researchers are inherently influenced by their social, cultural, and political contexts, and as such, complete value-neutrality is not attainable, contrary to the claims of the positivist paradigm (Grant & Giddings, 2014).

In the context of quantitative research within the post-positivist paradigm, ontology implies recognising underlying causal relationships and recurrent patterns of the social phenomena being investigated (Rahman, 2023). Utilising objective questionnaires is a common method to uncover patterns and relationships and gain insights into NP practice. Post-positivist epistemology places significant emphasis on theory in guiding research, empirical evidence, and probabilistic knowledge while acknowledging and addressing the influence of the researcher's subjectivity and bias. This approach enhances the rigour and transparency of the study, emphasising the need for interventionist methodologies and quantitative research methods to bolster the reliability and validity of the research findings (Khaldi, 2017; Rahman, 2023).

The selection of post-positivism as the research paradigm for this study offers valuable insights into the multiple interpretations of reality from the perspective of NPs (Davies & Fisher, 2018). By adopting this approach, the study balances personal and professional experiences and theoretical interpretation, allowing NPs to express their positions regarding the research topic (Roberts & Taylor, 1998). Given the post-positivist focus on understanding causal relationships, a correlational study using a questionnaire is deemed suitable for this research, following the recommendations of Khaldi (2017). The use of a questionnaire maintains a degree of separation between the researcher and the participants, ensuring deidentification and confidentiality of the data, as the researcher remains unaware of the respondents' identities (Grant & Giddings, 2014). Conducting a quantitative cross-sectional study, the findings from this research have the potential to substantially contribute to the scientific knowledge about NP practice in NZ. The insights gained through this study may shed light on specific aspects of NP practice and could serve as a foundation for further research and improvements in this field.

Theoretical Insights into Role Control and Support Theory

The theoretical underpinning of this research is the "role control and support" theory. Role control and support are theoretical constructs that aid in understanding how work characteristics relate to employee well-being, health, and performance. In 1979, Robert Karasek proposed the Job Demand-Control (JDC) model, positing that job demands and control are crucial job characteristics that influence a person's overall well-being (Häusser et al., 2010).

Role control and support are theoretical constructs that describe how individuals behave in the workplace. According to the theory, daily psychosocial demands on a person are not isolated events. Instead, they result from the combined effects of the job demands and the individual's freedom or ability to address those demands effectively. In essence, the level of psychological demand on an individual is determined by the interaction between job demands and their capacity to respond to them, enabling a sense of control over their situation. The "role control and support" theory constructs describe an individual's behaviour and a combination of interacting dimensions that can influence and can be influenced by the individual (Karasek, 1979).

To understand how NPs in New Zealand can exercise decision-making authority within the current hierarchical structure of health services, I selected the "role control and support theory". This choice of theory seeks to provide valuable insights into the NP workforce, including the opportunities to make decisions about their clinical practice and the organisational support needed to enhance their role. The theory posits that decision-making authority is legitimised by an individual's highest level of knowledge (Karasek & Theorell, 1990). By adopting this perspective, the theory minimises the influence of institutional power. It directs attention to the capacity of individuals to create their own opportunities or leverage existing

ones to achieve their objectives. This approach allows the research to focus on the NP workforce while mitigating the impact of factors such as organisational hierarchies.

The theory proposes that individuals must be able to exercise discretion in the methods and means of performing a role to meet the demands of a given situation effectively. This discretion refers to the individual's autonomy in deciding how to apply their skills to accomplish the objectives associated with their occupation (Karasek, 1979; Karasek & Theorell, 1990). For example, an NP's discretion might involve the freedom to choose a specific treatment approach based on the patient's needs and clinical judgement. Additionally, the theory emphasises the importance of having control over psychosocial demands in the workplace (Bernardes Santos et al., 2016). The theory presents the concepts of skill discretion and decision authority as mutually reinforcing aspects of work; therefore, they are combined and known as control or decision latitude. This means that individuals should have the socially agreed opportunity to exercise authority in everyday work decision-making, especially in managing the psychosocial aspects of their work environment. Having control over psychosocial demands enables employees to handle challenges, navigate interpersonal interactions, and exercise authority in decision-making (Häusser et al., 2010). This study seeks to understand the opportunities for NPs to exercise discretion in performing their role and the freedom to make decisions in clinical practice within the current health system.

The level of freedom of performance within a role significantly impacts various aspects, such as job satisfaction, role ambiguity and the ability to counteract psychosocial demands. For instance, increased freedom of performance can lead to greater job satisfaction and increased task engagement (Yang et al., 2021). Role ambiguity refers to the uncertainty or lack of clarity about the expectations and responsibilities of a particular role, such as NP scope of practice not understood by healthcare professionals and consumers. When individuals have the freedom to define and shape their roles, role ambiguity can be minimised, leading to better job performance and satisfaction (Dery et al., 2022). Additionally, the freedom of performance within a role strongly predicts professional development and self-efficacy. When individuals are empowered to make decisions to take ownership of their work, they gain confidence in their abilities and are more likely to achieve their goals (Yang et al., 2021).

Furthermore, the support provided by others plays a crucial role in helping individuals develop their ability to control their situation. A collaborative and supportive environment can foster a sense of empowerment and autonomy, leading to improved job performance and personal growth. Organisations can create a climate conducive to occupational learning and development by providing opportunities for increased autonomy (Merrick et al., 2014; Merrick et al., 2015).

The theory also outlines the importance of social support, which refers to the overall levels of helpful social interaction in a workplace. Social support can provide control over the psychological demands of the job, and this support can be provided by supervisors or colleagues

(Roelen et al., 2014). However, social support alone is not sufficient for an individual to develop control over the psychosocial demands of a role. Social support aims to create opportunities for occupational learning and development. According to Sargent and Terry (2000), high levels of social support mitigate against the adverse outcomes of high-strain jobs, leading to improved job satisfaction, autonomy and independence. The theory speculates that success for an individual depends on the availability of resources and opportunities. The theory predicts that learning and development will occur if these opportunities are present and individuals are socially supported (Karasek & Theorell, 1990). Those who perceive opportunities to contribute to decision-making, receive support, and participate in learning and development are likely to experience a sense of being valued and appreciated by others.

The construct of self-identity through work captures the sense of being valued and appreciated by others, encompassing the recognition of an individual's work by customers, employers and society (Eum et al., 2007). Nurse Practitioners often face a lack of understanding regarding their roles from their professional colleagues and healthcare consumers (Amost & Laschinger, 2005; De Milt et al., 2011). Understanding how NPs can identify their contribution to care becomes essential for informing future developments that may impact their functioning positively. Notably, self-identity through work positively predicts decision latitude, suggesting that nurses who strongly identify with their contributions to organisational and healthcare consumer outcomes feel more empowered to participate actively in organisational decision-making processes (Merrick et al., 2012).

The recognition of an individual's work by customers, as reflected through the construct of customer relationships, explores the influence of customer interactions and relationships. In the current study's focus on NPs' decision-making, the "customers" are the patients, residents, or clients. Nurses cultivate trusting relationships with their patients to participate in decision-making and to define themselves in relation to their patients. The nurses' relationships with patients were perceived as a central component of being recognised as an expert practitioner (Merrick et al., 2015). Nurse Practitioners' practice centres around the individual, focusing on patient empowerment, holistic care, and collaborative partnerships. Nurse Practitioners play a unique role in promoting person-centredness, a pivotal aspect in achieving better health outcomes and enhancing patient experiences (Bonner et al., 2020; Carryer & Adams, 2017).

Role and control theory describes the construct of job insecurity as a state characterised by a lack of resources, with a particular emphasis on the absence of job control. The health and well-being of the individual depend on the balance between the demands of the job and the availability of resources (Karasek et al., 1998). Job insecurity can profoundly impact an individual's well-being due to the psychological strain from a perceived lack of control over their circumstances, including concerns about potential unemployment, financial strain and family issues (Kalil et al., 2010). For nurses, experiencing feelings of insecurity in their work environment poses daily challenges in providing quality care and maintaining therapeutic

relationships. The uncertainty surrounding job stability can create an atmosphere of anxiety and tension, hindering their ability to deliver optimal care (Prado-Gasco et al., 2021).

Furthermore, job insecurity can affect nurses' satisfaction and commitment (Mahmoud & Reisel, 2014) and turnover intention (Yasin et al., 2020). Recognising the importance of improved working conditions and professional development, such factors can play pivotal roles in positively influencing nurses' performance and, by extension, enhancing the healthcare system's overall functioning. Despite the significance of job insecurity in nursing, it remains an area that has not been widely studied, as Prado-Gasco et al. (2021) noted. By exploring this concept within the context of NPs, valuable insights can be gained into their unique experiences and the potential of patient care and the healthcare system.

The application of the role control and support theory to NP practice environments will provide an understanding and insight into the autonomy of the role, as well as individual freedom and latitude of decision-making (Karasek et al., 1998; Merrick et al., 2012) and examine whether supervisory and collegial support buffered the impact of job demands and control on NP practice (Roelen et al., 2014). Understanding the decision-making dynamics of NPs holds significant potential for improving healthcare services and optimising patient outcomes in the context of the NZ healthcare system. By identifying the factors that enable or constrain NP decision-making, the study can pave the way for targeted interventions and organisational support to enhance the effectiveness and efficiency of NP practice.

Historical Perspective of Role Control and Support Theory

In the 1950s, the traumatic impact of the Second World War on mental health prompted a surge in social sciences research. Responding to this need, a "Mental Health and Social Environment" research programme was established at the University of Michigan's Institute for Social Research (ISR). As industrial growth flourished in the 1960s, ISR researchers shifted their focus to organisations and their impact on American lives. The programme initiated by French and Kahn (1962) focused on the workforce's health. Influenced by Kurt Lewin's field theory (1938), the researchers developed the person-environment fit (P-E fit) model of job stress, which explores the relationship between work and health (Conway et al., 1992).

According to the P-E fit model, job stress emerges from the interaction between job conditions and an individual's personality. This model proposes that the objective characteristics of the job, combined with the worker's psychological disposition, result in a subjective assessment of the worker's stress. Consequently, the same job may or may not be stressful to different workers, depending on their subjective view of job conditions (Caplan, 1987). The development of this theory laid the foundation for an intellectual approach to understanding individuals and organisations, now known as the Michigan Stress Tradition (Eskildsen & Dahlgaard, 2000).

In 1979, Karasek proposed the Job Demand-Control (JDC) model, which addresses job stress based on previous research by psychiatrists Thomas Holmes and Richard Rahe in 1967.

Their work on stressful life events, distress, and illness led to the Social Readjustment Rating Scale, later known as the Holmes and Rahe Stress Scale (Holmes & Rahe, 1967; Noone, 2017). Karasek researched Scandinavia, a region at the forefront of workers' well-being studies, to expand this model. He built on studies conducted by Gardell (1971), which highlighted the protective effect of autonomy at work. According to Karasek's model, job strain results from the interaction between job demands (stressors) and job decision latitude (control). Job strain occurs when workers experience demanding jobs that offer little control over how they meet these demands. Unlike the P-E fit model, which relies on workers' subjective reactions, Karasek's JDC model predicts job strain based on the structural characteristics of the job (Karasek, 1979).

Job demands and control represent two key job aspects of the work situation, and in 1990, researchers introduced the Job Demand-Control-Support (JDCS) model by incorporating a social dimension (De Jonge et al., 2000; Karasek, 1979). Initially proposed by Johnson and Hall (1988), the inclusion of work-related social support in the JDC model was based on their findings that low social support, combined with high job demands and low decision latitude, increased workers' strain and risk of cardiovascular disease (CVD). A study involving 13,779 randomly selected Swedish male and female workers revealed that the lack of social support raised the CVD prevalence ratio across all demand-control categories (Johnson & Hall, 1988; Johnson et al., 1989). Recognising the significance of social support as the third dimension, Karasek and Theorell (1990) incorporated co-worker and supervisory support indicators to mitigate the consequences of work situations characterised by high demands and low control, thus evolving the JDC model into the JDCS model.

The Job Demand-Control-Support model has been extensively used for decades in research examining the impact of work characteristics on workers' health and well-being (Dawson et al., 2016). However, the model faced criticism on theoretical and methodological grounds and for its simplicity (Häusser et al., 2010; Niedhammer et al., 2008; Van der Doef & Maes, 1999). Some researchers have expressed concerns about the model's theoretical framework and ability to capture the complexities of work-related stress fully. Niedhammer et al. (2008) and later Niedhammer et al. (2018) specifically highlighted methodological limitations related to reporting bias due to using self-reported measures for both psychological work factors and health outcomes. Such bias may lead to overestimating the association between psychosocial work factors and health, known as the common bias method. To address these concerns, Niedhammer et al. (2018) developed an objective assessment of exposure known as the job-exposure matrix (JEM) for psychosocial work factors in the JDCS model. This matrix provides a more reliable and unbiased way to measure workers' exposure to psychosocial factors at work. The study utilised data from the 2003 SUMER survey, involving a sample of 24,486 French workers. The survey was repeated in 2010 with an expanded sample of

46,962 workers, providing robust evidence for the validity of the JEM and JDCS model in understanding the relationship between work characteristics and workers' health.

Over the years, empirical studies have consistently supported the assumed main effects of strain in both longitudinal studies (de Lange et al., 2003) and cross-sectional studies (Van der Doef & Maes, 1999). In a 10-year review, Häusser et al. (2010) reported that 29 out of 97 studies supported the interaction effect for strain, indicating that the relationship between job demands and job control influences worker strain. Additionally, a review of longitudinal studies by de Lange et al. (2003) identified eight of 19 JDCS model studies that found a significant interaction between job demands and job control (Verhofstadt et al., 2015). Despite critical evaluations of the JDCS model's validity, the buffer hypothesis, which suggests that job control and social support interact with job stressors to reduce worker strain, continues to dominate the literature, as Dawson et al. (2016) reported.

The Job Content Questionnaire (JCQ) is an instrument developed by Karasek to measure the JDCS model. Through its psychometrically robust constructs, the JCQ measures the psychological and social characteristics of jobs within three primary dimensions: (1) psychological demands; (2) decision latitude (including two sub-dimensions, skill utilisation and decision authority); and (3) social support from both colleagues and supervisors (Fan et al., 2019; Karasek et al., 1998). The scales are valuable for exploring activation, employee motivation, and job satisfaction questions. The role control model, proposed by Karasek (1979), hypothesises that job strain is most pronounced in jobs characterised by high demands and low control, commonly referred to as high-strain jobs. Such job conditions can trigger adverse reactions to psychological stress. While the current study on NPs does not explicitly focus on job strain, it is essential to reference it within the context of the JDCS model.

The Job Content Questionnaire has been recognised as one of the most commonly utilised questionnaires for assessing psychosocial working conditions since 1984, making it a pivotal tool in numerous studies exploring the characteristics of professional roles, including nursing (Häusser et al., 2010; Niedhammer et al., 2020; Zeike et al., 2018). Its global reach extends to over 29 languages, with its application spanning various regions, including Western Europe and South-East Asian countries (Sasaki et al., 2020).

Exploring the Job Demand-Control-Support Model Research in Nursing

Since the early 1980s, researchers have applied the JDCS model to investigate the psychosocial work environment among nurses in different countries. This section will focus on the previous 10 years of JDCS research, essential for validating the JCQ and providing the most recent and relevant findings. The validity and reliability of the JCQ have been established, making it a robust instrument for assessing psychosocial factors in the international population of nurses.

The need for improved quality healthcare, the challenges of increasing populations, and global nursing workforce shortages have driven research about job strain among nurses. Nurses

are considered vulnerable to job strain because of high job demands and low levels of job control. The Job Demand-Control-Support model, comprising job demand, job control, and supervisory support, has proven valuable in understanding nurses' job strain across different cultures. For instance, Baba et al. (2013) conducted a cross-sectional study of nurses in four locations (China, Japan, Argentina, and the Caribbean). They highlighted the significance of these variables in understanding nurses' work-related stress.

The cross-cultural applicability of the JDCS model makes it a valuable tool for developing intervention strategies in the workplace for nurses worldwide. Although the current study's primary focus is not on stress, it is worth noting that JDCS research delves into stress and other relevant constructs that apply to this study of NPs.

Validation of Job Content Questionnaire in International Nursing Research

International studies validating the JCQ in a general population of nurses focussed on collaborative practice and the value of social support in improving decision-making, turnover and job satisfaction. These studies highlighted a common theme, showing that supervisory/managerial support mitigated the negative effect of job strain.

The analysis of the JDCS model in assessing work-life balance among nurses in 35 European countries (*n*=991) conducted by Navajas-Romero et al. (2020) revealed that perceived supervisor support was significantly higher than perceived support from co-workers. This finding is noteworthy and warrants further research and thoughtful discussion within nursing. The study proposed that investing in the training of work teams could lead to improvements in organisational culture and social support. Furthermore, providing nurses with new protocols to control their daily activities (decision latitude) can enhance their freedom to make decisions and improve patient care, ultimately contributing to a better work-life balance (Navajas-Romero et al., 2020). However, the study was limited by its focus on a socio-geographic region that contained countries with different health systems and labour codes, which may condition the JDCS model's fundamental variables.

Practice autonomy for nurses (*n*=222) was explored in a study conducted in Canada by Dery et al. (2022) to understand the relationships between the scope of practice, work environment, and job satisfaction. The study found high scores for psychological job demands and low scores for decision latitude among nurses, indicating a potential risk of psychological stress, which correlated with low job satisfaction. Managerial support was crucial in optimising nurses' autonomy and job satisfaction. Such support was proposed as key to improving organisational performance and reducing absenteeism in the current high turnover and health workforce shortages (Dery et al., 2022). The study's limitations included a lack of distinction between college and university-qualified nurses and its restriction to five healthcare centres.

Validation of the JCQ among hospital nurses (*n*=949) in Vietnam (Sasaki et al., 2020) indicated acceptable internal reliability in two scales- supervisor support (α=.87) and a slightly lower result for co-worker support (α=.86). However, the study identified low reliability for

psychological job demands (α=.50), a result consistent with findings from other Asian studies (Amin et al., 2015; Eum et al., 2007). Despite this limitation, the findings confirmed that the JCQ could be used to examine the psychosocial work environment among nurses. The study suggested reconsidering the psychological job demands scale as few items may not adequately address the psychosocial work factors. The study had methodological rigour but was limited by the short core version of JCQ (22 items instead of 49) due to participants' time constraints.

A study of practice nurses (n=160) in Australian general practice by Merrick et al. (2012) confirmed the reliability of the constructs of the JCQ (α=.66 to .86) and identified that social support improved practice nurse decision-making. The correlation between social support scales was significant (r=.70, p<.011). These findings suggest that enhancing social support may play a crucial role in positively influencing the recruitment and retention of nurses and promoting interprofessional collaboration (Merrick et al., 2012). In a Malaysian study of nurses in public hospitals, Amin et al. (2015) found the JCQ to be reliable and valid in measuring psychosocial and physical stressors in the workplace, with the highest reliability observed for supervisory support (α=.83). However, psychological job demands showed only a moderate internal consistency (α=.51). The study recommended refining this scale in future research involving nurses to ensure more accurate assessments of psychological stress in the workplace.

Job Content Questionnaire studies related to the association between turnover and job strain among nurses in a Colombian hospital (n=222) conducted by Triana-Palencia et al. (2019) and among nurses in all practice settings in Norway (n=889) by Blytt et al. (2022), demonstrated that social support has a protective effect on turnover. The Colombian study of hospital nurses reported that more than 50% experienced job strain, particularly in highly complex care areas such as ICUs. However, the study did not identify an association between job strain and turnover, likely due to contextual effects rather than an evaluation of job strain at the individual level. Nevertheless, the study found a significant inverse association between job strain and social support from colleagues and managers, highlighting the positive role of social support in fostering teamwork and collaboration (Triana-Palencia et al., 2019).

The Job Content Questionnaire using 889 Norwegian nurses showed that shift work disorder (SWD) predicted turnover intention one year later, indicating that nurses with SWD were more likely to consider quitting their job than nurses without it. Shift work disorder was highly prevalent among shift-working nurses and was associated with adverse health outcomes. The data from this study was derived from the longitudinal study of Norwegian nurses, titled "Survey of Shift Work, Sleep and Health (SUSSH)", conducted from 2008 until 2016. The findings confirmed that workplace social support had high internal consistency (α=.845) and was negatively associated with turnover intention. The study proposed that social support had a buffering effect concerning nurses' turnover and turnover intention, suggesting that working in a supportive environment can make nurses more resilient to the negative impacts of shift work (Blytt et al., 2022). The study faced challenges in identifying the total population of nurses as no

data was available on non-participants. Additionally, it reported low internal consistency for the decision latitude scale (α=.597).

Acute and chronic fatigue as factors leading to burnout among nurses (*n*=313) in the United States were explored by Ross et al. (2021). The study utilised several assessment scales and inventories, including the JCQ, which generated high internal consistency, ranging from α=.73-.91. The results from the study confirmed that sleep disturbance was associated only with acute fatigue. In contrast, chronic fatigue was related to high job demands and low decision latitude (job strain). Higher levels of collegial support significantly predicted a decrease in chronic and acute emotional fatigue. The findings suggested that a combination of factors, including job strain, social support, emotional coping, and the ability to recover between shifts, were all required to reduce nurses' overall risk of acute and chronic fatigue (Ross et al., 2021). The study was limited by a low response rate (26.6%) and was restricted to one hospital with nearly all-RN staff with a high level of education. As a result, its generalisability to other nursing environments with a diverse mix of nurses and assistants may be limited.

Research on challenge-related stress and perceived job challenges among aged care nurses (*n*=239) conducted in Australia by Gao et al. (2017) concluded that increased social support and skill utilisation should be provided to improve nurses' psychological well-being. Support from immediate supervisors was identified as the most effective intervention to reduce stress related to job challenges. Similar findings were obtained in a JDCS cross-sectional study of Iranian nurses (*n*=427) in ICUs by Bagheri et al. (2017), which showed that supervisory support improved decision-making, resulting in higher job satisfaction, reduced nurses' burden, and decreased psychological job demands. Furthermore, another study of 730 nurses in public hospitals in Iran (Bagheri et al., 2021) found that higher nurse job satisfaction was directly related to support from supervisors. The study recommended increasing autonomy for nurses, which would improve their decision-making abilities about patient care, especially for those with higher levels of education and work experience.

Job Demand-Control-Support Nursing Research During the COVID-19 Pandemic

As a result of the global COVID-19 pandemic, numerous JDCS studies have focused on job strain, burnout, workload, and the buffering effect of social support. The widespread coronavirus (COVID-19) and its rapid transmission have been recognised as testing the limits of global healthcare, placing unprecedented pressure on healthcare workers, particularly on the largest health workforce, nurses (Filipcic & Isaac, 2022). According to the WHO, between the onset of the pandemic in December 2019 and March 2023, over 760 million confirmed COVID-19 cases and 6.8 million deaths were reported in over 210 countries (World Health Organization, 2023). Therefore, protecting healthcare workers' psychological well-being was deemed a greater priority for the future, especially beyond the COVID-19 crisis. This global pandemic is particularly interesting to the current study about NPs' decision-making as the survey was conducted in the first year of the COVID-19 pandemic in September 2020.

The relationship between post-traumatic stress disorder (PTSD) and turnover intention was studied in Iranian nurses (n=479) working in hospitals and medical centres during the COVID-19 outbreak in June 2020 (Mirzaei et al., 2022). Nurses are vulnerable to PTSD during epidemics as they work at the forefront of healthcare and are more exposed to infectious diseases. The Iranian study utilised several questionnaires, including the JCQ, and reported that 86.6% of the nurses experienced PTSD. The results indicated that PTSD, general health, job demands, job strain, and job insecurity had a positive relationship with the turnover intention of the nurses. The study's multiple regression results indicated high social support, especially supervisor support, was associated with decreased PTSD and turnover intention (R^2=0.51, p=.043). Supervisory support was identified as providing the nurses with the ability to cope with job demands, facilitate work performance, and be a buffer against adverse work conditions (Mirzaei et al., 2021). The study's limitations included its focus on nurses in one city, which may limit the generalisability of the findings to all nurses in Iran. Furthermore, the study identified time constraints for participants during the pandemic, attributed to increased work demands and fatigue.

Job strain and burnout among Spanish nurses (n=1,013) and the buffering effects of resilience were analysed at the end of the first year of COVID-19 restrictions in 2020 by Molero Jurado et al. (2022). Nurses were exposed to high-stress levels during the pandemic because of increased workloads, organisational changes, and personal and family safety threats. The study measured the dimensions of the JDCS model, resilience, and burnout using the JCQ, burnout, and resilience scales. Results of the study through structural equation modelling demonstrated that job strain was negatively influenced by social support (-.54, p<.05), was negatively related to resilience (-.26, p<.05), and was positively associated with burnout (.68, p<.01). The findings confirmed that high job demands are associated with burnout and that social support reduces job strain. Job strain affected the nurses' burnout levels, which were mediated by resilience, indicating that a high level of resilience can significantly impact their well-being and job performance. The study recommended that nurses be provided with the capacity to cope with the job demands, and having social support will improve their psychological well-being. However, the study's cross-sectional design impeded the establishment of causal conclusions between job strain and burnout. Additionally, the snowball sampling method may not represent the general nursing population in Spain.

The prevalence of burnout risk among intensive care and emergency nurses was assessed by Butera et al. (2021) in Belgium before and during the COVID-19 pandemic. Two online surveys were completed, the first in January 2020 at the beginning of the pandemic (n=442) and four months later at the peak of the first wave of COVID-19 (n=1,616). The Maslach Burnout Inventory was used to assess the risk of burnout, and the JCQ measured social support. The results indicated that the overall prevalence of burnout risk was higher among ED nurses than among ICU nurses, and this remained stable over both parts of the study. However,

ICU nurses demonstrated an increased prevalence of burnout after the COVID-19 pandemic. This indicates that the pandemic had a more significant burnout impact on ICU nurses than ED nurses, although ED nurses had a higher overall risk of burnout. The determinants of burnout risk were identified as a change in workload experienced differently by both study participant groups. In the ICU group, 89.1% reported a significant increase in workload after the first year (2020) of COVID-19, while 37% of ED nurses reported a simultaneously decreased workload. Both groups said a lack of personal protective equipment was a significant risk of burnout. Social support from colleagues was identified as a protective factor against burnout in both groups of nurses; however, ICU nurses valued supervisor and management support as more important. The study was at risk of selection bias due to the convenience sampling method, using an online survey with voluntary participation. The participants might have been nurses who wanted to share their challenges during the pandemic, which could result in overestimating the risk of burnout.

International Job Demand-Control-Support Research in Nurse Practitioner Populations

International JDCS studies about NP practice have been limited in the previous two decades; four publications since 2002, one from Canada and three from Taiwan were identified. The earliest study of Canadian NPs by Amost and Laschinger (2005) tested the theory of organizational empowerment, and the JCQ was used to measure the study's job strain variables. Two groups of NPs were recruited for the study: 63 acute care NPs (ACNPs) employed in large hospitals and 54 primary care NPs (PCNPs) in community settings. The internal reliability of the JCQ was acceptable, with a result of α=.78 for ACNPs and α=.65 for PCNPs for decision latitude, and higher figures α=.74 (ACNPs) and α=.80 (PCNPs) for psychological job demands. The Nurse Practitioners in both groups perceived themselves as moderately empowered via moderate collaboration with managers and moderately high collaborative practice with physicians. An overall low level of job strain was perceived, which suggested that the control over NPs' work had offset psychological job demands. The study identified a difference in perceptions about the importance of collaborative practice with physicians (colleagues) and managers (supervisors). Collegial support from physicians was more important in the PCNPs' perception of empowerment because of the proximity of collaborative practice in PHC. The acute care NP group considered collegial support important; strong alliances and support from managers were more valuable. The hospital based ACNPs felt less empowered because of their workload and the large size of the organisations. The primary care NP group had greater access to resources, support, visibility, and practice autonomy than the ACNP group. The recommendations from the study were meant for NPs, managers, and physicians to build a climate of mutual trust and support that encourages autonomous professional practice. The study's limitations included potential participant bias, as NPs were recruited only from Ontario and Toronto and worked in acute care hospitals and community centres. Therefore, the findings

may not be generalisable to the entire population of NPs in Canada, other countries, or different clinical areas.

The impacts of job content and stress on anxiety, depressive symptoms, and self-perceived health status were explored in a population of 161 NPs in Taiwan (Chen et al., 2016). Several stress scales, inventories, and cortisol tests, including the JCQ, were used. The Nurse Practitioners in Taiwan were senior nurses with three years of experience in a medical or surgical department who had completed a two-stage national certification process. The government established the NP role in 2006 without a clear legislative scope of practice, and NPs in Taiwan worked under the supervision of a physician. The Taiwanese NP role is not autonomous or independent, and NPs remain clinical practitioners without prescribing rights and are restricted in providing direct patient care. The lack of legislative scope of practice has been identified as stressful for NPs in Taiwan. The findings confirmed that NPs experienced higher job stress than the general nursing population and perceived themselves as having mild anxiety and depressive symptoms. The multiple regression analysis showed statistically significant results between the ages of 35-39 years (B=-.46, p=.028), lower job control (B=-.03, p=.001), perceived increased psychological job demands (B=.03, p<.001), and increased job stress. No association was found between job stress and social support. The authors suggested that the higher job stress among NPs compared to nurses was due to higher job demands such as management of complex patients, diagnostic and prescribing responsibility, and lack of social support. The study participants demonstrated below-average self-perceived health scores compared to the general health dimension scores from a national health survey. This contributed to the continuous high-stress work environment, resulting in a poor perception of health. The implications for nursing management were to identify work stressors, clarify job content and use practical work scheduling. Professional development was recognised as crucial in maintaining clinical competence and enhancing NPs' confidence and responsibility, reducing stress at work and improving personal well-being (Chen et al., 2016). The limitation of the study was the inability to assess the impact of long-term job strain due to the cross-sectional study design.

A subsequent Taiwanese study by Hu et al. (2018), using acute care NPs as participants, investigated the relationship between social support and factors associated with perceived self-efficacy in transitional role development. Questionnaires were distributed to NPs in 2015 at seven hospitals, and a high response rate (78%) was achieved with a final sample size of 335 participants. The Multidimensional Scale of Perceived Social Support and the JCQ measured *social support*, while the General Self-Efficacy Scale measured perceived self-efficacy. The JCQ had high internal validity (α=.884).

The results established that NPs in Taiwan had significantly higher perceived support from colleagues than supervisors. Furthermore, monthly salary significantly affected self-efficacy, showing that NPs in the high-salary group had significantly higher scores for self-

efficacy than NPs in the low and medium-salary groups. The study concluded that NPs in Taiwan did not perceive themselves as having sufficient self-efficacy but that support from coworkers, family, friends, and significant others was an important contributor to NPs self-efficacy. Hu and colleagues suggested that Nurse Practitioners who perceive themselves as having higher collegial support and higher monetary compensation may have increased job satisfaction, less work stress, and less burnout (Hu et al., 2018). The study recruited NPs from one area in northern Taiwan; therefore, it was limited in generalisability to the entire population of NPs.

Factors affecting job strain among acute-care NPs in Taiwan were studied by Yang et al. (2021) with a sample size of 1,396 participants. Understanding NPs' job strain was deemed necessary to improve the quality of care delivered and NP job satisfaction and retention. Several online surveys were used, including a Condition for Work Effectiveness Questionnaire, the Dempster Practice Behaviour Scale, and the Job Content Questionnaire. The participants were classified into four main job types as per the JDCS model. The job classifications included "active job" (high demands and high control), "passive job" (low demands and low control), "low- strain" (low demands and high control), and "high- strain" (high demand and low control). The category of "active job" was deemed optimal for reducing job strain. The internal validity of JCQ was acceptable for job control (α=.72) and job demand (α=.71). The findings identified that 24.4% of NPs were in the "passive job", 31.4% in the "active job", 19.2% in the "low strain", and 24.9% in "high strain" job type. The study illustrated negative associations between organisational empowerment and job strain, indicating that increased organisational empowerment was associated with lower job strain, indicating that organisational empowerment was important to ensure NPs' perception of job control and reduced job strain. Higher degrees of autonomy had protective effects for the "high strain" job type in that reducing the restrictions to NP practice can improve performance and job satisfaction (Yang et al., 2021). Furthermore, Yang and colleagues suggested NPs might be dissatisfied with their working environment when sufficient support is absent. Although this study utilised a self-report data collection method, it nevertheless suggests that social support and autonomy play an important role.

The Job Content Questionnaire is a popular assessment model with validated analytical processes, a comparative nature, and a sound theoretical foundation (Baba et al., 2013). The JDCS studies in the population of nurses and NPs were of high quality. They identified multiple work stressors affecting the nurses' work environment. Fourteen of 20 JDCS studies used the JCQ and other scales to measure the outcomes. The six nursing studies using the JCQ as a single measure in the last 10 years included the following: Merrick et al. (2012) in Australia; Baba et al. (2013) in China, Japan, Argentina, and the Caribbean; Amin et al. (2015) in Malaysia; Triana-Palencia et al. (2019) in Colombia; Navajas-Romero et al. (2020) in Europe; and Sasaki et al. (2020) in Vietnam. Yet, the gaps remain in JCQ research, particularly regarding the population of NPs in Australia and New Zealand.

Summary

International JDCS studies have demonstrated a perceived protective effect of social support in optimising professional autonomy, improving job satisfaction and reducing turnover intention among nurses. Social support can come from various sources, including colleagues, supervisors, and managers. The studies mentioned in this context have shown methodological rigour, with the majority having adequate sample sizes representing the studied population of nurses. However, it is evident that there is a lack of JCQ research specifically focused on NP practice, with only four studies identified, one in Canada and three in Taiwan.

The Job Demand-Control-Support model studies conducted on the general nursing population in various countries share a common theme: supervisory support is perceived as more important for nurses than collegial support. Supervisory support gave nurses more freedom to make decisions about practice (decision latitude), enhanced practice autonomy and job satisfaction, and reduced work-related stress. The reliability and validity of the constructs of the JCQ were established in the population of nurses in Europe, South-East Asia, Canada, North and South America, and Australia. However, the present research is the first study conducted in New Zealand to apply the role control and support theory to NP practice environments. The following chapter describes the research design and methods used to investigate the aim of the study and answer the research questions. It also describes the validated questionnaire (the JCQ) used to collect data.

Chapter Four: Methods

Introduction

This chapter outlines the research design, the methods employed to collect data and the statistical analysis plan to address the study's aim and research questions. The primary objective of this study is to identify organisational opportunities for NPs to make decisions about their practice and to identify if the relationships predicted by the role control and support theory apply to the studied population of NPs in New Zealand, as measured by the Job Content Questionnaire. This chapter provides an overview of the constructs and items, including demographic information. Furthermore, the validity and reliability of the questionnaire and the study's ethical considerations are discussed.

Design of the Study

The study adopted an observational research design and employed a cross-sectional survey that gathers data at a single fixed time. This survey targeted a representative sample from the larger population of interest, aiming to explore the relationships between various phenomena. The theoretical model that guided the study is the "role control support", and data measurement was facilitated by utilising the internationally validated JCQ. Cross-sectional studies, such as the present study, are suitable for describing relationships among phenomena being investigated or for describing relationships among phenomena at a single point in time (Polit & Hungler, 1999).

This study's aim and research questions were ideally suited to a cross-sectional design, enabling the examination of associations between job characteristics at a specific time point. As the first Job-Demands-Control and Support (JDCS) study conducted with NPs in NZ, this research represented a pioneering exploration of the relationship between variables under scrutiny, providing crucial foundational insights for future longitudinal studies. Conducting longitudinal studies would require tracking and collecting data through repeated observations of the same participants or groups over an extended period (Dempsey & Dempsey, 2000). However, given this professional doctorate's time and resource constraints, such a longitudinal approach posed significant challenges. By adopting a cross-sectional design, the research efficiently assessed the associations between job characteristics, serving as a valuable starting point for future investigations in this area.

One limitation of the cross-sectional study design was its inability to establish causal inferences (Wang & Cheng, 2020). This study aimed to assess the strength and direction of relationships between the JCQ constructs rather than establishing causal relationships. The Job Content Questionnaire relies on self-reported measures, which are potentially susceptible to respondent bias, thus impacting the internal validity of responses. As noted by Polit and Hungler (1999), social desirability bias (or respondent bias) can occur when participants tend to

present a favourable image of themselves. To mitigate the respondent bias, the JCQ was designed with a minimalist word format to minimise confusion among participants.

A convenience (non-probability) sampling approach was utilised for this study. This sampling method was chosen because NP participants were intentionally selected as the representatives of the population under investigation. Convenience sampling was deemed more suitable than random sampling due to the relatively small population of NPs in NZ at the time of data collection, which numbered 350 individuals. As my objective was to encompass the entire NP population, this minimised sampling bias as the whole population of interest was likely to be invited to participate in the study. Sampling bias arises when certain individuals within the studied population are more likely to be included in the study than others (Wang & Cheng, 2020).

The recruitment strategy span over one month and involved emailing the online version of the JCQ via Qualtrics^{XM} survey software to NPs in NZ. In September 2020, NPs affiliated with Nurse Practitioners New Zealand (the NPNZ), a professional association and a part of the College of Nurses Aotearoa, received an email invitation to participate in the study. To ensure a robust response rate, NPNZ distributed invitations to participate voluntarily in the online self-administered questionnaire twice in September 2020.

To minimise recruitment bias, as outlined by McRobert et al. (2018), it is essential for the source population from which participants are sampled to replicate the target population closely. At the time, NPNZ's membership accounted for approximately 80% of the 350 NPs registered in NZ and was the sole professional association for NPs.

Participants were assured of anonymity in the study, as no data that could potentially identify them was collected, therefore minimising response bias. Survey anonymity can reduce response bias by creating an environment where respondents feel more comfortable providing honest and accurate responses (Wang & Cheng, 2020). The survey was accessible through desktop computers, tablets, or mobile phone devices, ensuring privacy during completion. The prospective participants were requested to access the survey link provided by the NPNZ, granting them access to the NP JCQ via Qualtrics^{XM} survey software. The survey began with participant information on the first page, followed by two informed consent questions. Once participants indicated their informed consent, they gained access to the questionnaire. A sixty-one-item questionnaire was adapted from the original Job Content Questionnaire (Karasek, 1979) and measured constructs related to NP decision-making opportunities.

Sample Size and Recruitment Methods

The required sample size was estimated to achieve sufficient statistical power using G*Power version 3.1.9.4 (Faul, 2019). This estimation was based on assuming a normal data distribution for a priori linear multiple regression model. The Auckland University of Technology's biostatistician provided oversight of statistical calculations, ensuring their

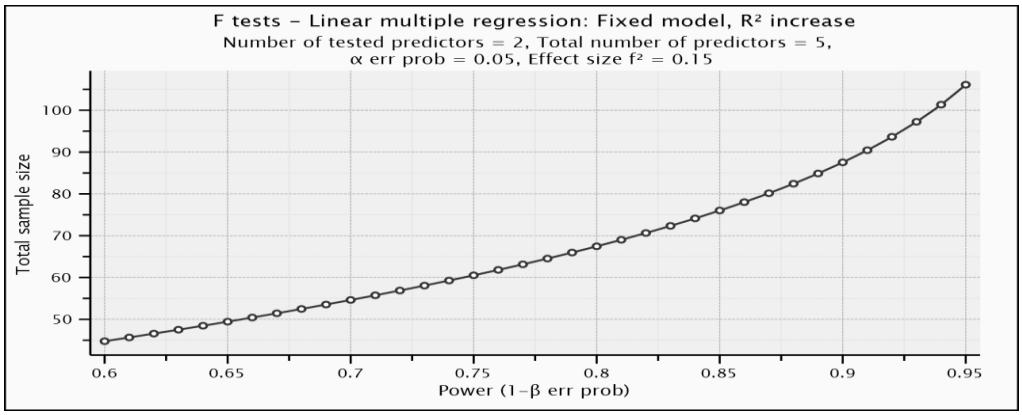
accuracy and reliability. As outlined by Tabachnick and Fidell (2014), it was critical to establish adequate statistical power when planning a study. The sample size determined statistical power and was essential for detecting true effects or relationships in the data.

According to Field (2018), a well-designed research study aims to balance Type 1 and Type 2 errors. Type 1 and Type 2 errors occur when making decisions about survey results. Type 1 error (a false positive) occurs when claiming a genuine effect or relationship exists when it does not. To control Type 1 errors, the significance level (α) is usually set at .05, indicating a 5% error rate. On the other hand, a Type 2 error (a false negative) is the opposite of a Type 1 error, failing to detect a genuine effect or relationship that exists. A Type 2 error is represented by β, which also represents the power of the test, which is influenced by sample size, effect size, and significance level (Field, 2018).

Statistical power represents the probability of detecting genuine effects during data analysis, leading to statistical significance. Effect size, on the other hand, quantifies the strength of a relationship or differences between variables, making it valuable for group comparisons and result analysis. The author completed four estimates to calculate the required sample size: (1) estimate the size of the expected effect; (2) identify the variability expected in the assessment of the effect; (3) set the desired α level (usually set at .5); and (4) set the desired power (usually set at .8, indicating an 80% chance of detecting an effect if one genuinely exists). By performing these calculations, confidence was gained in finding a statistically significant effect (i.e., $p<.05$) during the planning stages of the study (Tabachnick & Fidell, 2014). In this study, a linear regression model assumed two predictors and an effect size of .15, indicating a moderate effect. The chosen α probability was .05. The calculated critical F value was 2.68, and the achieved power was .95. Based on these estimates, the predicted required sample size for the study was n=107. Figure 4 displays the power calculation of the estimated sample size for the current study.

Figure 4

The Power Calculation



Note. G*Power version 3.1.9.4 was used (Faul, 2019).

The recruitment strategy adhered to the guidelines of the *Privacy Act* 2020. The College of Nurses Aotearoa (NZ) Inc. had already obtained consent from their NP members to use their email addresses for research relevant to their practice, aligning with ethical considerations. Overall, the convenience sampling approach and the recruitment strategy aimed to involve NPs effectively while protecting their privacy and ensuring ethical conduct throughout the study.

Inclusion Criteria

The inclusion criteria were NPs registered with the NCNZ; NPs were the population of interest in this research.

Demographics

The demographic variables held a vital role in this study, as they were essential for providing context and enhancing the validity and generalisability of the findings. Additionally, they played a key part in describing the JCQ constructs of interest. By integrating demographic data, the researcher gained a comprehensive understanding of the sample and can more effectively interpret the implications of the research findings (Dempsey & Dempsey, 2000). Among the demographic variables, ethnicity and geographical location held particular significance to NP practice, and they also provided valuable baseline data for other studies, especially within Māori communities. Understanding the trends in the representation of Māori and Pacific Peoples' NPs, as well as variations among different Asian or European cultures, can offer crucial insights into workforce diversity and cultural competence.

The collected demographic data also informed research questions about geographical location and clinical speciality areas. It allowed for examining trends such as the ageing and female-dominated nature of the NP workforce, commonly observed globally in nursing (Jamieson et al., 2019). Moreover, it aided in identifying potential shifts from historically narrow scopes of NP practice to broader ones, aligning with the objectives set forth by the NCNZ.

The demographic variables used in this study adhered to the NCNZ nursing workforce demographics for 2018- 2019. The survey included seven demographic questions covering gender (Q1), age (Q2), ethnicity (Q3), current employment setting (Q4), the current area of clinical specialty (Q5), demographic location of main practice (postcode) (Q6), and number of years of practice as an NP (Q7) (see Appendix F). With the foundation of demographic data presented, the following section describes the constructs measured by the JCQ.

Constructs of the Job Content Questionnaire

Since its development in 1984, the JCQ has emerged as the most extensively utilised research tool for assessing the constructs of the "role control and support" theory. It provides valuable insights into various professional roles' psychosocial working conditions and characteristics (Häusser et al., 2010). The questionnaire measures role control, demand, and support theory constructs. It encompasses perceived decision-making abilities, support from

colleagues, supervisors and managers, customer relationships, job insecurity and the perceived contribution to service delivery (Dawson et al., 2016; Mauss et al., 2018). In the current study, the JCQ was employed to assess job psychological and social characteristics using well-established psychometric properties. While this tool has been widely used in populations of nurses, its application in NZ is novel and significant. The Job Content Questionnaire's extensive usage and effectiveness in evaluating important job-related factors made it an ideal choice for the present research, especially considering its unique application in NZ.

The Job Content Questionnaire comprised 61 questions that assessed various constructs and sub-scales. Over time, the format of the JCQ has evolved. In 1994, it consisted of 49 questions; in 2015, an additional 12 questions were included to enhance comprehensiveness. The constructs employed in this study included "*decision latitude*" (which consists of the two sub-scales "*skill discretion*" and "*decision authority*"), "*psychological job demands*", "*job insecurity*", "*social support"* (which encompasses two sub-scales "*supervisor support*" and "*co-worker support*" and the two additional constructs namely "*customer relationships*" and "*self-identity through work*". To measure each construct, a Likert scale was used, with an answering format ranging from 1 (strongly disagree) to 4 (strongly agree) (Karasek, 2015). This comprehensive questionnaire and its inclusion of various constructs made it a valuable tool for examining the psychosocial aspects of NPs' work environment in this study. The Likert scale format ensured a nuanced understanding of the participants' perceptions and responses.

Job Content Questionnaire is a self-administered survey designed to measure job social and psychological characteristics using the following constructs: (1) *psychological demands*, (2) *decision latitude*, and (3) *social support.* Additionally, the JDCS model measures behavioural correlates of jobs and explores other aspects, such as (4) *job insecurity*, (5) *customer relationships*, and (6) *self-identity through work* (Karasek et al., 1998). The online JCQ questionnaire was administered to NPs in New Zealand via the Qualtrics^{XM} survey software. The questionnaire consisted of two consent questions (C1-2), seven demographic questions (Q1-7), and 61 items (Q8-68). These items measured constructs related to decision-making latitude, supervisor and colleague support, work commitment and job security. The constructs of the JCQ and each construct's items are outlined below.

Decision Latitude

The construct of *decision latitude* measured an individual's capability to control their tasks and work activities. It pertained to the methods and means chosen to perform a specific role. *Decision latitude* served as the primary dependent variable in this study. It is a composite construct comprised of two sub-scales: (1) *skill discretion* and (2) *decision authority*. *Skill discretion* reflects an individual's ability to utilise specific job skills, while *decision authority* represents a person's autonomy in decision-making, including control over timing and methods (Häusser et al., 2010).

While some researchers have used the sub-scales of *decision latitude* independently without creating a composite measure or focused on one sub-scale without the other, the author in this study decided to employ both sub-scales. The decision was driven by the fact that the JCQ has not been previously used in the NZ NP population, and the specificity of the scale for measuring the phenomenon of interest remained to be determined. It was essential to consider both sub-scales as it was impossible to pre-determine the most relevant scale for NPs without empirical investigation (Navajas-Romero et al., 2020; Sasaki et al., 2020).

The *decision latitude* construct consists of nine items. For *skill discretion,* the six items are as follows: " My job requires that I learn new things" (Q3), "My job involves a lot of repetitive work" (Q4), "My job requires me to be creative" (Q5), "My job requires a high level of skill" (Q7), " I get to do a variety of different things on my job" (Q9) and " I have an opportunity to develop my own special abilities" (Q11). Regarding *decision authority,* the three items are: "My job allows me to make a lot of decisions on my own" (Q6), "On my job, I have very little freedom to decide how I do my work" (reversed) (Q8), and "I have a lot of say about what happens on my job" (Q10).

Psychological Demands

The *psychological job demands* construct measured various aspects such as workload, the constraints on task completion, and conflicting demands in the workplace. This construct was essential in understanding job strain, which can occur when an individual faces high psychological demands and has low *decision latitude* (Karasek et al., 1998). In this study, *psychological job demands* are referred to as the demands of performing a role. The interest of job demands in this research was not to ascertain the level of job strain but whether there was an association with NPs' autonomy in making decisions about their practice. The construct included five items: "My job requires working very fast" (Q19), "My job requires working very hard" (Q20), "I am not asked to do an excessive amount of work" (reversed) (Q22), "I have enough time to get my job done" (reversed) (Q23), and "I am free from conflicting demands that others make" (reversed) (Q26).

Social Support

The *social support* construct measured opportunities for a person to be supported at work. The theory predicts that increased *social support* is associated with greater *decision latitude*. *Social support* was divided into two composite sub-scales: (1) *co-worker support* and (2) *supervisory support*. *Co-worker support* pertained to the amount of support the individual received from the people they work with. The four items for *co-worker support* are: "People I work with are competent in doing their jobs" (Q53), "People I work with take a personal interest in me" (Q54), "People I work with are friendly" (Q56), and "People I work with are helpful in getting the job done" (Q58). *Supervisory support* denotes the level of support a person receives from their immediate supervisor or manager. The four items for *supervisory support* are: "My

supervisor is concerned about the welfare of those under him/her" (Q48), "My supervisor pays attention to what I am saying" (Q49), "My supervisor is helpful in getting the job done" (Q51), and "My supervisor is successful in getting the people to work together" (Q52).

Earlier JCQ nursing validation studies (Merrick et al., 2012) combined the two sub-scales in measuring *social support*. However, more recent studies by Amin et al. (2015) and Sasaki et al. (2020) distinguished the independent effects of *co-worker* and *supervisory support*. One of this study's research questions pertained to support from colleagues and/or supervisors and its influence on NPs' decision-making about practice. Consequently, both sub-scales were analysed and studied independently to understand the impact of social support on NPs' decision-making process.

Job Insecurity

The *job insecurity* construct is associated with work-related psychological burdens, encompassing concerns about potential unemployment and restricted future career development opportunities (Zolnierczyk-Zreda & Bedynska, 2014). Three items were used to measure this construct: "How steady is your work?" (Q33), "My job security is good" (reversed) (Q34), and "Sometimes people permanently lose jobs they want to keep. How likely is that during the next couple of years, you will lose your job with your employer?" (Q36).

Self-Identity Through Work

This construct explains the importance of a person's work being recognised by others, such as a customer, company, or society. The theory suggests that *self-identity through work* is positively correlated with *decision latitude* and *social support* (Karasek, 1979; Karasek et al., 1998). Six items relate to the *self-identity through work* construct: "My knowledge about the customer's satisfaction is a major source of my feelings of being important and valuable on the job" (Q65), "My work group or unit makes an important contribution to society" (Q66), "I am appropriately respected and rewarded by my company for my work" (Q67), "My skills and abilities are 'vital' to my work, group or unit" (Q68), "I get information feedback from my supervisor about how well I do my job" (Q69), and "I produce a whole or identifiable product or service in my job- that is, I can easily 'point out' my contribution to the final product or service" (Q70).

Customer Relationships

The *customer relationships* construct assesses the impact of customer interactions and relationships on the worker. The construct was measured by six items: "I often get information feedback one way or another about how the customers or clients feel about the product or service I produce" (Q59), "I often get to know clients or customers as individuals on my job" (Q60), " One way or another, customers or clients can influence the kind of product or service I produce" (Q61), "I can affect what the clients or customers want" (Q62), "Satisfying the

customer provides me with an important source of challenges on the job" (Q63), and "I am subject to hostility or abuse from clients or customers" (reversed) (Q64).

Validity and Reliability of the Job Content Questionnaire

The construct and replication validity of the JCQ have been well-established in international research over the past 40 years. It has effectively captured occupational characteristics in various professions, including nursing, and has been validated as a predictor of health, motivation, and productivity outcomes (Choi et al., 2008; Häusser et al., 2010; Karasek et al., 2007). Numerous extensive cross-sectional studies (Amin et al., 2015; Roelen et al., 2014; Tuomi et al., 2016; Zeike et al., 2018) have focused on the associations between job strain and RNs, detecting links between high job demands, low control, and self-perceived mental health indicators. The theoretical model chapter discusses the extensive research on the JCQ within the nursing profession.

The Job Content Questionnaire has consistently demonstrated high internal and external validity and reliability levels in diverse occupational groups worldwide, including RNs (Amin et al., 2015; Hu et al., 2018). However, there is currently no evidence specifically testing the assumptions of the JCQ in a population of NPs in NZ. Herein, the cultural relevance of the JCQ in NZ is established as part of the tool's internal and external validity testing. It is important to note that the JCQ was not altered for this research, given the established statistical reliability, internal scale reliability, and construct validity found in other studies. The research followed the guidelines provided in the JCQ user guide (Appendix D).

Analysis Plan

Job Content Questionnaire scale scores were calculated according to the formulas presented in the original manual (see Appendix D). The analysis involved (1) scale reliability analysis, (2) descriptive statistics, and (3) construct validity (Karasek et al., 1998). To address the research questions, linear regression was employed. The intended techniques in this study included assessing the psychometric properties, such as scale reliability (coefficient α), and measuring the inter-correlations between JCQ constructs. The inter-correlations helped to identify any significant associations between the constructs.

Furthermore, construct validity was assessed using confirmatory factor analysis (CFA) to determine the covariance structure and to test the similarity of factor structures in the studied population to the theoretical JCQ model. The strength and direction of the association was tested through linear regression analysis. Additionally, the study tested for significant differences between the means of groups of interest, such as geographical locations.

Data Preparation and Cleaning

Following data preparation and cleaning, the statistical analysis of the questionnaire data was conducted using SPSS version 28™ [including the PROCESS macro by Andrew F. Hayes (2022) and AMOS version 28.0™ (IBM®, 2021)] software. Raw scale responses,

representing the numerical value for each response category, were exported from Qualtrics™ into SPSS version 28™ (IBM®, 2021). The data cleaning process involved coding variables with numerical values for each response category, facilitated by SPSS version 28™ (IBM®, 2021). The data was inspected for input accuracy, including out-of-range values, plausible means, standard deviations, and outliers. Responses with over 80% of missing data were categorised as MAR (missing at random, called ignorable non-response). These responses were excluded from the analysis to prevent potential confounding of the results (Tabachnick & Fidell, 2014). Next, individual scores for each scale were calculated based on the author's formulae as described in the JCQ user's guide (Karasek, 2015; Karasek et al., 1998) (see Appendix D). These calculations were automated using the SPSS version 28™ (IBM®, 2021) syntax, ensuring efficiency and accuracy in the analysis process.

Seven items in four constructs must be reversed-scored on the Likert scale to ensure that all the responses were coded in the same direction for reliability and CFA. This practice was recommended by the JCQ user's guide and outlined by Amin et al. (2015). The items included: "My job involves a lot of repetitive work" (Q4) on the *skill discretion* scale, "On my job, I have very little freedom to decide how I do my work" (Q8) on the *decision authority* scale, "I am not asked to do excessive amount of work" (Q22), "I have enough time to get my job done" (Q23), "I am free from conflicting demands that others make" (Q26) on the *psychological job demands* scale, "My job security is good" (Q34) on the *job insecurity* scale, and "I am subject to hostility or abuse from clients or customers" (Q64) on the *customer relationships* scale.

Descriptive Analysis

Descriptive statistics were calculated to provide a comprehensive description and summary of the data. The first descriptive analysis focused on describing the sample, specifically the demographic characteristics of the participants. Subsequently, the distribution of the respective constructs were then described by calculating the central tendency (i.e., the mean) and the variability (i.e., the standard deviation and the minimum and maximum range). Additionally, skewness and kurtosis values for each construct and sub-scale were calculated. Skewness values indicated the symmetry of distribution, while kurtosis values represented the sharpness of the peak of a distribution curve (Tabachnick & Fidell, 2014).

The approach used in transformation involved converting the scale and/or construct data to a z-score by dividing the standard error, as Field (2018) recommended. A resulting z-score greater than 1.96 was considered indicative of deviation from a normal distribution. It is important to note that linear regression analysis, which was used in this study to test the relationships between variables, was not extremely affected by outliers and did not heavily rely on the assumption of normal data distribution. Instead, it assumed that the sampling distribution of the sample means was normally distributed (Field, 2018, p. 169).

Reliability Analysis

To describe the statistical relationships in the data, the internal consistency of each scale was calculated. This was achieved using the co-efficient α, which is often used to establish the internal consistency of an instrument, including the JCQ questionnaire (Bonneterre et al., 2011; Mauss et al., 2018). For the co-efficient α test, the average of all correlations in every combination of split halves was calculated, and the result was a number between 0 and 1. Based on previous JCQ research, a scale is considered consistent if α falls between .61 and .90 (Sasaki et al., 2020; Van Poel et al., 2020; Vastamaki et al., 2017). Furthermore, the inter-correlations between the different sub-scales was calculated using Spearman's rank correlation. Spearman's correlation is a non-parametric statistic that can be used to minimise the effects of the extreme scores if the data do not meet assumptions of normality and cannot be transformed (Field, 2018, p. 351).

Construct Validity

Confirmatory factor analysis (CFA) was conducted to determine the construct validity of the JCQ in the present sample and was based on the approach of previous research (Sasaki et al., 2020; Zolnierczyk-Zreda & Bedynska, 2014). The results of the CFA analysis provided an understanding of the contribution of factors to the original theoretical model. Construct validity of the JCQ was evaluated with CFA using SPSS version 28™ and AMOS version 28.0™ (IBM®, 2021). This analysis and the model's fit index was assessed based on the approaches taken by previous JCQ research (Niedhammer et al., 2020; Orgambidez & Almeida, 2020; Roelen et al., 2014) to ensure that consistent results are produced on many different indices to support a good-fitting model.

Out of the 61 JCQ items, 25 items were selected to analyse the four constructs of *decision latitude*, *psychological job demands*, *social support*, and *job insecurity*. The higher the loading, the more the variable was a true measure of the construct (for CFA, referred to as a factor). Loadings above .71 (50% overlapping variance) were considered excellent predictors of the factor, .63 were considered very good predictors (40% overlapping variance), .55 were good predictors of the factor (30% overlapping variance), .45 were fair predictors of the factor solution (20% overlapping variance), and .32 predictors (10% overlapping variance) were considered poor predictors of the factor.

The resulting factor models were tested until the most parsimonious model is identified. Selecting the parsimonious model that most adequately fits the studied population depends on the fit statistics, as Tabachnick and Fidell (2014) recommended. The confirmatory factor analysis modelling began with the a priori assumption that the correct factor solution contained six factors. These were the two sub-scales of *decision latitude*, namely, *skill discretion* (six items) and *decision authority* (three items), *psychological job demands* (five items), the two sub-scales of *social support*, namely *co-worker support* (four items) and *supervisor support*

(four items), and lastly *job insecurity* (three items) (Orgambidez & Almeida, 2020). Several fit statistics were used to assess the model's goodness-of-fit, as suggested by previous JCQ research (Vastamaki et al., 2017; Zolnierczyk-Zreda & Bedynska, 2014). These fit indexes included the Chi-square, the comparative fit Index (CFI), the Tucker Lewis index or non-normed fit index (NNFI), the PCLOSE, and the root mean square error of approximation (RMSEA).

If the results of the Chi-square test are significant, it may suggest a less-than-desirable model fit within the present sample. However, it is essential to recognise that the Chi-square test alone does not provide a complete picture of model fit, as this statistic is highly sensitive to sample size (West et al., 2012). Kline (2005) recommended a more comprehensive assessment of the model fit by considering additional fit statistics, such as the RMSEA, NNFI, and CFI. These indices offered a holistic view of goodness of fit. For a well-fitting model, the CFI and NNFI with values above .9 indicated a good fit of the model to the data. Additionally, the RMSEA and the PCLOSE should be equal to or less than .05 (Kenny et al., 2015).

Linear Regression

Linear regression models were developed to answer the following five research questions:

1. Does support from colleagues and/or supervisors influence NPs' freedom to make decisions about practice?
2. Is there a relationship between social support and NP-patient relationships, and does the freedom to make decisions about practice influence this relationship?
3. Are the demands of performing a role associated with NPs' freedom to make decisions about practice?
4. Is the geographical location of practice associated with the freedom that NPs have in making decisions about practice?
5. Is there a relationship between work commitment and job security for NPs, and if so, does the geographical location moderate this relationship?

To understand the relationships between the variables, the process of fitting a linear model to data was utilised to determine the strength and direction between the observed variables (Field, 2018). The regression models were only be developed when a significant correlation coefficient was first observed. Simple and multiple regression has been previously applied in JCQ research (Hu et al., 2018; Sasaki et al., 2020; Zeike et al., 2018). As explained by Field (2018), for the linear model to generalise findings, all of the following assumptions must be met: (1) additivity and linearity, (2) normally distributed errors, and (3) homoscedasticity. The assumption of additivity and linearity means that the outcome variable should be linearly related to any predictors, signifying that any changes in the predictor variable are related to changes in the outcome variable.

The normality assumption assumes that the regression residuals follow a normal distribution and that the error term is normally distributed. The residuals represent the differences between what the model predicts and the observed data, essentially capturing the error present in the model. If the model fits the sample data well, then the residuals will be small, and all the data points fall on or close to the regression line. Conversely, a poorly fitted model will result in a large residual, indicating a poor fit to the sample data. Another important assumption is homoscedasticity, which means that the residuals for each explanatory variable have the same (constant) variance. Unequal variances are called heteroscedasticity, and violating this assumption invalidates the confidence intervals and significance tests (Field, 2018).

Additivity, normality of residuals and homoscedasticity were examined and reported through residuals scatterplots. Scatterplots of residuals were presented; the distribution of the residuals in the scatterplot was important. The residuals should be nearly rectangularly distributed, with most scores concentrated along the centre (0-point line). To further ensure the assumption of homoscedasticity of the residuals, a Breusch Pagan test can be conducted in SPSS version 28™ (IBM®, 2021). A non-significant result from this test would indicate that the residuals were not significantly influenced by the variable (e.g., *social support*), and therefore, the assumption of homoscedasticity was not violated (Fox, 2020; Karakostas, 2004).

To decrease the Type 1 error, a *p*-value of $p<.05$ was considered statistically significant. Additionally, the confidence intervals were reported. The significance of a test statistic is directly linked to the sample size, which was calculated by G*Power version 3.1.9.4 (Faul, 2019). Furthermore, the power of a statistical test is the probability of detecting an effect when one exists (Field, 2018; McGiffin et al., 2021).

Mediation Analysis

Mediation analysis addressed the second research question, “Is there a relationship between social support and NP-patient relationships, and does the freedom to make decisions about practice influence this relationship?” Mediation analysis is a statistical process that tests whether the relationship between two variables is explained or affected by a third mediator variable. The middle variable is considered a mediator, causing an indirect effect on the outcome variable (Hayes, 2022). In essence, the mediation analysis tests whether the predictor variable is associated with the outcome variable through a mediator variable.

In this study, the mediation analysis showed whether a relationship between *social support* and *customer relationships* existed and if this relationship was mediated through *decision latitude*. Model 4 (Hayes, 2022) was utilised using the macro Process in SPSS version 28TM (IBM®, 2021). The outcome variable, *customer relationships*, was entered as a dependent variable, *social support* as the predictor variable, and *decision latitude* as the mediator variable.

Moderation Analysis

Moderation analysis addressed the fifth research question: "Is there a relationship between work commitment and job security for NPs, and if so, does the geographical location moderate this relationship?" Moderation analysis tests for an interaction between the predictor variables. In other words, it tests whether the relationship between one predictor variable and an outcome variable is dependent on or moderated by another predictor. To explore this interaction, the moderation process of Model 1 (Hayes, 2022) was tested in SPSS version 28™ (IBM®, 2021) using the macro Process. In this analysis, *job insecurity* was entered as the outcome variable (Y), *self-identity through work* as the predictor variable (X), and geographical location (metropolitan and rural) as a moderator variable (W).

One-Way Analysis of Variance

A one-way analysis of variance (ANOVA) was planned to be used to address the fourth research question: "Does the freedom that NPs have to make decisions about practice vary in relation to the geographical location of practice?" One-way ANOVA is a statistical procedure (analysis of variance) used to compare two or more group means and tests the overall fit of the linear model (Field, 2018). The three geographical location groups in the current study are rural, small urban, and metropolitan.

Ethical Approval and Considerations

Approval for this research was sought and obtained from the Auckland University of Technology (AUT) Ethics Committee (AUTEC# 20/194) on 31st July 2020. The official letter of approval from AUTEC is included in Appendix A. In Appendix E, all respondents provided informed consent before participating in the online survey (Questions C1-2). To ensure the highest ethical standards, all data was deidentified before undergoing analysis. The data was securely stored on an external USB device in a locked facility, safeguarding participant confidentiality.

This research considered the principles of the Treaty of Waitangi, which emphasise partnership, participation, and protection. The ethics of this research and the gaining and sharing of knowledge incorporate these three principles. The Māori Ethical Framework has been integrated into the research design, guiding the approach to cultural and social responsibilities. The influence of these considerations on potential study outcomes has been carefully examined (Hudson & Russell, 2008). By incorporating these ethical principles and frameworks, this research aimed to comprehensively understand the subject while respectfully acknowledging and honouring Māori values and perspectives.

Summary

This observational study utilised a cross-sectional survey based on the theoretical constructs of the "role control support" model. The measurement was conducted by the validated JCQ. To address the aim of the study and the research questions, there was a need to

understand opportunities for NPs to be supported to make decisions in clinical practice. This can be achieved by measuring the constructs within the role control and support theory and testing the theoretical predictions. Data collected was analysed using statistical tests conducted in SPSS version 28™ and AMOS version 28.0™ (IBM®, 2021).

The analysis included assessing the psychometric properties using scale reliability and inter-correlations to identify any significant associations between the sub-scales. The construct validity was also assessed through CFA to test the similarity of factor structures in the studied population to the theoretical JCQ model. Furthermore, linear regression analyses were conducted to establish and describe the relationships between the various constructs of the JCQ. In the subsequent chapter, the findings of the study will be presented.

Chapter Five: Results

Introduction

This chapter presents the study's findings, encompassing the sample's demographics, descriptive statistics (i.e., the internal consistency of the JCQ and inter-correlations of the variables), and results from CFA, the independent samples *t*-test and the linear regression analysis.

Demographics

The online survey was distributed in September 2020, and it received responses from 194 NPs, which accounted for 55% of the total 350 NP workforce listed in NCNZ's public register of nurses (Nursing Council of New Zealand, 2020). Following consultation with the Auckland University of Technology's biostatistician and the process explained by Tabachnick and Fidell (2014), 25 respondents were excluded from the analysis because more than 80% of their responses were missing. For the CFA, missing data were removed listwise, meaning that if any participant had missing data for any item, they were removed from the data set. The listwise removal of missing data is because using AMOS version 28.0™ (IBM®, 2021) for CFA requires no missing data. After removing all the missing cases with missing data, the final sample size was 169 (*n*=169), representing 49% of the NP workforce at the time of the survey distribution.

Nurse Practitioners completed all surveys, resulting in a final sample size of 169 (n=169). Among the respondents, 93.5% (158) identified as female, while 6.5% (11) identified as male. The two largest age groups were 50-59 (4.8%) and 40-49 (27.8%). As anticipated, these findings suggest that the NP profession predominantly comprises females over 40. Regarding ethnicity, most respondents identified as European, accounting for 87% (147) of the sample. Māori and part-Māori represented 7.1% (12), Asian and part-Asian constituted 4.1% (7), and Pacific Peoples made up .6% (1) of the sample.

In terms of experience, most respondents reported practicing as an NP for 2-5 years, comprising 53.8% (91) of the sample. This was followed by those with more than six years of experience at 31.4% (53) and those with less than one year of experience at 14.8% (25). Concerning employment, the highest percentage of respondents, 46.2% (78), were employed by DHBs. This was closely followed by 36.1% (61) working in PHC, 4.7% (8) in residential aged care settings, and 2.4% (4) in rural community practices. Primary healthcare was the most common area of specialty, reported by 29.6% (50) of the respondents. For a detailed overview of the sample's demographic characteristics, refer to Table 4. The majority of results for each demographic variable are highlighted in grey.

Table 4

Demographic Characteristics of the Sample

		Count	Percent
NP		169	100%
Gender	Male	11	6.5%
	Female	158	93.5%
Age (in years)	25-29	3	1.8%
	30-39	22	13.0%
	40-49	47	27.8%
	50-59	69	4.8%
	60+	28	16.6%
Ethnicity	European	147	87%
	Māori + part-Māori	12	7.1%
	Pacific Peoples	1	.6%
	Asian + part-Asian	7	4.1%
	Other	2	1.2%
Current employment setting	DHB	78	46.2%
	PHC	61	36.1%
	Residential aged care	8	4.7%
	Rural/ Community	4	2.4%
	Other	18	1.7%
Current area of clinical specialty	Acute/ critical care	8	4.7%
	Emergency	16	9.5%
	Paediatrics	7	4.1%
	PHC	50	29.6%
	Coronary care/ heart failure	4	2.4%
	Older adult	14	8.3%
	Adult	4	2.4%
	Diabetes	5	3.0%
	Chronic conditions	3	1.8%
	Respiratory	2	1.2%
	Renal	5	3.0%
	Palliative care	7	4.1%
	Sexual and women's health	4	2.4%
	Mental health	8	4.7%
	Other	32	18.9%
Length of time practicing as an NP	Less than 1 year	25	14.8%
	2-5 years	91	53.8%
	Longer than 6 years	53	31.4%
Demographic location of main practice	Auckland	40	23.7%
	Palmerston North	9	5.3%
	Christchurch	9	5.3%
	Whangārei	7	4.1%
	Tauranga	6	3.6%
	Wellington	6	3.6%
	Dunedin	6	3.6%
	Rotorua	4	2.4%
	Whanganui	3	1.8%
	Masterton	3	1.8%
	Blenheim	3	1.8%
	Small urban & rural (population <10,000)	35	2.7%
	North Island (total)	130	76.9%
	South Island (total)	39	23.1%

Note. Sample size, *n*=169.

The geographical regions were classified according to the Statistical Standard for Geographic Areas (SSGA), with small urban areas having a population between 1000 and 9999 and rural settlements having a population between 200 and 999 (Statistics New Zealand, 2021).

Regarding the geographical location of the main NP practice, the most common location was Auckland, accounting for 23.7% (40) of respondents, followed by 5.3% (9) each in Palmerston North and Christchurch. Most respondents practised on the North Island, constituting 76.9% (130), while 23.1% (39) practised on the South Island. Nurse Practitioners reported practising in small urban and rural areas with a population of less than 10,000, making up 2.7% (35) of the sample. The geographical distribution of the main practice locations is visually represented in Figure 3.

Figure 3

The Geographical Location of Main Practice for NPs

Descriptive Statistics

Distribution of Data

Examination of data distributions is essential in statistical analysis, as it allows the author to gain insight into the characteristics and patterns of the collected data. One critical aspect of this examination is assessing the normality assumption, which assumes that the data follows a normal (bell-shaped) distribution. If data is normally distributed, it allows for parametric statistical tests which offer more precise estimates. Conversely, non-parametric tests may be more appropriate if the data is not normally distributed. Furthermore, reviewing data distributions helps identify outliers and understand their impact on the dataset. It also provides valuable information about data variability, which indicates the extent to which the data points deviate from the central tendency (Field & Wilcox, 2017; Field, 2018).

Moreover, this process validates assumptions that are essential for various statistical tests. By examining distributions, researchers can ensure that their chosen tests are appropriate and that the underlying assumptions are met. Furthermore, examining data distributions facilitates the detection of potential data issues, such as data entry or collection errors. Identifying irregular patterns or inconsistencies is crucial, allowing researchers to address these issues before further analysis (Tabachnick & Fidell, 2014).

A data distribution review was completed for the current study**,** and the findings are presented in Table 4. The z-scores of the skewness (i.e., the skewness values divided by the standard errors) were examined to assess the normality of the data. It was observed that the data for the scales of *psychological job demands*, *co-worker support*, *supervisor support*, *social support*, and *job insecurity* violated the assumption of normality. This violation occurred as the skewness z-scores were greater than 1.96, indicating a significant deviation from a normal distribution**.** Additionally, most scores fell more than three standard deviations from the mean. Positive values of the z-scores suggest an abundance of low scores in the distribution (Field, 2018, p. 249). Additionally, the z-scores of the kurtosis (i.e., the kurtosis values divided by the standard errors) indicated that the data for *created skill* and *job insecurity* scales also violated the assumption of normality, as these scores are greater than 1.96. The positive values indicate that pointy and heavy-tailed distributions characterised the data for these two scales.

Normality in the data is essential for the researcher to make conclusions about the sampling distribution being normal, allowing them to determine the probability of a specific test statistic occurring (Field, 2018, p. 265). Conversely, when there is a lack of normality, the researcher cannot ascertain the shape of the sampling distribution and, therefore, the probability of a certain test statistic occurring. To address this issue, one of the recommended robust methods is bootstrapping, which involves estimating the properties of the sampling distribution of the dataset. The bootstrapping process is based on repeatedly taking random samples from the dataset, and then the mean is calculated in each bootstrap sample. The process is typically repeated around 1000 times, generating 1000 parameter estimates (Field, 2018). In the present

study, bootstrapping was applied to the analysis. The results of the data distribution of the JCQ scales and sub-scales can be found in Table 5.

Table 5

Means, Standard Deviations (SDs), Minimum and Maximum Range, Skewness, Skewness Standard Error, Skewness z-score, Kurtosis, Kurtosis Standard Error, Kurtosis z-score of the JCQ Scales and Sub-Scales

				Range		Skewness			Kurtosis		
Variable	*n*	*M*	*SD*	Min	Max	Skew	Skew SE	z-score	Kurt	Kurt SE	z-score
Skill discretion	169	4.31	3.89	28	48	-.28	.19	-1.47	-.33	.37	-.89
Created skill	169	8.47	.98	4	12	-.06	.19	-.32	3.08	.37	8.32
Decision authority	169	4.02	5.98	24	48	-.35	.19	-1.84	-.52	.37	-1.41
Decision latitude	169	8.33	8.72	60	96	-.33	.19	-1.74	-.69	.37	-1.86
Psychological job demands	169	35.38	4.83	26	48	.51	.19	2.68	-.19	.37	-.51
Co-worker support	168	12.91	1.56	8	16	.49	.19	2.58	-.06	.37	-.16
Supervisor support	169	13.52	3.39	7	20	.75	.19	3.95	-.18	.37	-.49
Social support	168	26.44	3.93	18	36	.57	.19	3.00	-.21	.37	-.57
Customer relationships	168	17.79	2.13	11	23	-.12	.19	-.63	.53	.37	1.43
Self-identity through work	167	18.95	2.56	11	24	.01	.19	.05	-.25	.37	-.68
Job insecurity	169	4.24	1.55	3	11	2.10	.19	11.05	5.67	.37	15.32

Internal Reliability of Job Content Questionnaire

Internal reliability of the JCQ was assessed using co-efficient α using in SPSS v.28™ (IBM®, 2021), and the scale was considered reliable if α falls between .61 and .9. Table 6 presents the co-efficient α for each scale. In the current study, the internal reliability for all scales was above the acceptable level of .61, falling between .63 and .89 (see Table 6). Although *decision latitude* formed a reliable scale (α= .69), the two sub-scales, *skill discretion* (α=.52) and *decision authority* (α=.58), did not.

Upon reviewing the item-total correlations for the *skill discretion* sub-scale, it was observed that three items in this scale had correlations below the acceptable level of .3. Specifically, the item "My job requires that I learn new things" had the lowest item-total correlation of .04, followed by "My job involves a lot of repetitive work" with a correlation of .13 (note that this item was reversed to be in the same direction as the other items in the scale). The third item with a low correlation was "My job requires a high level of skill", with an item-total correlation of .24. These low correlations indicate that these items did not correlate well with the overall sub-scale of *skill discretion*. However, removing these items did not improve the co-efficient α to an acceptable level above .61, so all the items were retained.

For the *decision authority* sub-scale, the item-total correlations were reviewed. Only one item out of three fell below the acceptable level of .30, specifically the item "My job allows me to make a lot of decisions on my own" with a correlation of .28. Deleting this item improved the co-efficient α to .61. However, as this was not a substantial improvement in the co-efficient α for the *decision authority* sub-scale, the item was retained.

Inter-Correlations Between the Constructs

According to Field (2018), correlation analysis is a starting point to examine the data graphically before fitting models. Inter-item correlations reveal the relationship between items or variables within a data set. These correlations can be either positive or negative, indicating the direction and strength of the relationship between the items. A positive correlation means that as one item deviates from the mean, the other item deviates in the same direction (i.e., as one item increases, the value of the other item also increases). On the other hand, a negative correlation indicates that one item deviates from the mean and the other deviates in the opposite direction. This suggests that when one item's value is high, the other is likely to be low. The strength of the correlations between items can vary. A strong positive correlation indicates a highly predictable and consistent relationship between the items.

Furthermore, a strong negative correlation indicates a strong and inverse relationship between the items. On the other hand, weak correlations (positive or negative) suggest a less predictable or consistent relationship between the items (Field, 2018). Inter-correlations of the JCQ constructs (and the sub-scales) were calculated using SPSS v.28™ (IBM®, 2021). A non-parametric test, the Spearman rank correlation, was used, according to the results of the skewness and kurtosis, as data was not normally distributed for all the scales.

Overall, the results of the inter-correlations suggest that *decision latitude*, representing the combined measure of *skill discretion* and *decision authority*, was significantly correlated with all the other constructs except for *psychological job demands*. Specifically, the variable of *psychological job demands* did not correlate significantly with any of the variables, except for a negative correlation with *job insecurity* (-.21, p<.01). This negative correlation indicated an association between higher job security for NPs and reduced *psychological job demands*. An important finding is that *psychological job demands* did not correlate significantly with the other constructs.

Social support correlated highly with *decision latitude* (.22, p<.01) and *decision authority* (.19, p<.05), indicating a positive association between NP decision-making and autonomy with support from colleagues and supervisors or managers. *Job insecurity* had a significant but weak negative correlation with most of the variables, including *social support* (-.16, p<.05) and highest with *decision latitude* (-.22, p<.01) and the strongest correlation with *self-identity through work* (-.33, p<.01). An association may indicate that as the trust, cohesion, and emotional support from co-workers increases, job insecurity is reduced.

The highest correlation was between *decision latitude* and *self-identity through work* (.41, *p* <.01), suggesting a relationship between an NP's freedom to make decisions and work identity/ commitment. Similarly, *decision authority, co-worker support,* and *self-identity through work* correlated significantly with all scales except *psychological job demands*. Table 6 represents the number of participants, α reliabilities, and inter-correlations of the JCQ constructs and sub-scales.

Table 6

Number of Participants, α Reliabilities, and Inter-Correlations of the Variables

	α	1	2	3	4	5	6	7	8	9	10	11
n		*169*	*169*	*169*	*169*	*168*	*169*	*168*	*168*	*168*	*167*	*169*
1. *Skill discretion*	.52	---	---	---	---	---	---	---	---	---	---	---
2. Created skill	.63	---	---	---	---	---	---	---	---	---	---	---
3. *Decision authority*	.58	---	---	---	---	---	---	---	---	---	---	---
4. Decision latitude *(Skill discretion +Decision authority)*	.69	---	**.35****	---	---	---	---	---	---	---	---	---
5. Psychological job demands	.72	-.01	.05	-.05	-.05	---	---	---	---	---	---	---
6. *Co-worker support*	.75	**.21****	.06	**.21****	**.24****	-.08	---	---	---	---	---	---
7. *Supervisor support*	.89	.12	.15	**.17***	**.18***	-.15	**.17***	---	---	---	---	---
8. Social support *(Co-worker support + supervisor support)*	.79	.15	.12	**.19***	**.22***	-.15	---	---	---	---	---	---
9. Customer relationships	.64	**.34****	**.19****	**.29****	**.35****	.04	**.17***	.13	.14	---	---	---
10. Self-identity through work	.71	**.41****	**.16***	**.47****	**.50****	-.09	**.33****	**.19****	**.28****	**.43****	---	---
11. Job insecurity	.64	-.11	.02	**-.23****	**-.22****	-.07	**-.20****	-.09	**.16***	-.10	**-.33****	---

Note. *** $p < .001$, ** $p < .01$, *$p < .05$ (two-tailed).

Job Content Questionnaire Confirmatory Factor Analysis

Construct validity of the JCQ was evaluated through CFA using SPSS version 28™ and AMOS version 28.0™ (IBM®, 2021). CFA is associated with theory testing, and the JCQ is an internationally validated instrument with an established factor contribution to its constructs. Therefore, the results of the CFA analysis provide an understanding of how well the data in the present study fit the original theoretical model.

Three models were tested in the analysis. Model One is the six-factor theoretical model, while Model Two and Model Three propose more parsimonious models. Theoretical Model One is a six-factor model with *skill discretion, decision authority, psychological job demands, supervisor support, co-worker support,* and *job insecurity*. Model Two is a five-factor model combining skill discretion and decision authority into *decision latitude*. On the other hand, Model Three is a four-factor model combining *co-worker support* and *supervisor support* into the *social support* factor.

Model One

Several fit statistics were calculated to assess the model's goodness-of-fit of the observed data in the present sample and the theoretical JCQ model. The results are presented in Table 6 and include the Chi-square, the comparative fit index (CFI), the Tucker Lewis index or non-normed fit index (NNFI), the PCLOSE, and the root mean square error of approximation (RMSEA). Results (Model One) of the Chi-square test (408.78) were significant (p<.001), thereby indicating a significant difference between the theoretical model and the observed data in the present sample. Although this suggests a less-than-desirable model fit, the chi-square test does not necessarily show the complete model fit, as this statistic is very sensitive to sample size (West et al., 2012). Results of the model fit (see Table 6, Model One) show that firstly, the CFI is acceptable as it is above .80 (although a more acceptable value would be above .90). The NFI is also acceptable. However, again, above .90 would have been more acceptable. Secondly, the PCLOSE is above the accepted .05, and the RMSEA is an acceptable .06.

The modification indices results were examined to determine whether covarying errors of the items with high covariances could enhance the fit of Model One. Specifically, a high covariance between items "My job requires a high level of skill" (Q7) and "I get to do a variety of different things on my job" (Q9) (22.19) in the *skill discretion* scale and also, between items "My job requires working very fast" (Q19) and also "My job requires working very hard" (Q20) (18.39).

In response to these findings, the errors of these items were covaried in the analysis. This modification resulted in an improved model fit, as evidenced by the increase in CFI to a value above the acceptable threshold of .90 (CFI=.91) and a reduction in RMSEA to .05 (see Table 7). Table 7 summarises the model fit statistics and their respective values, highlighting the improvement resulting from the modifications.

Table 7

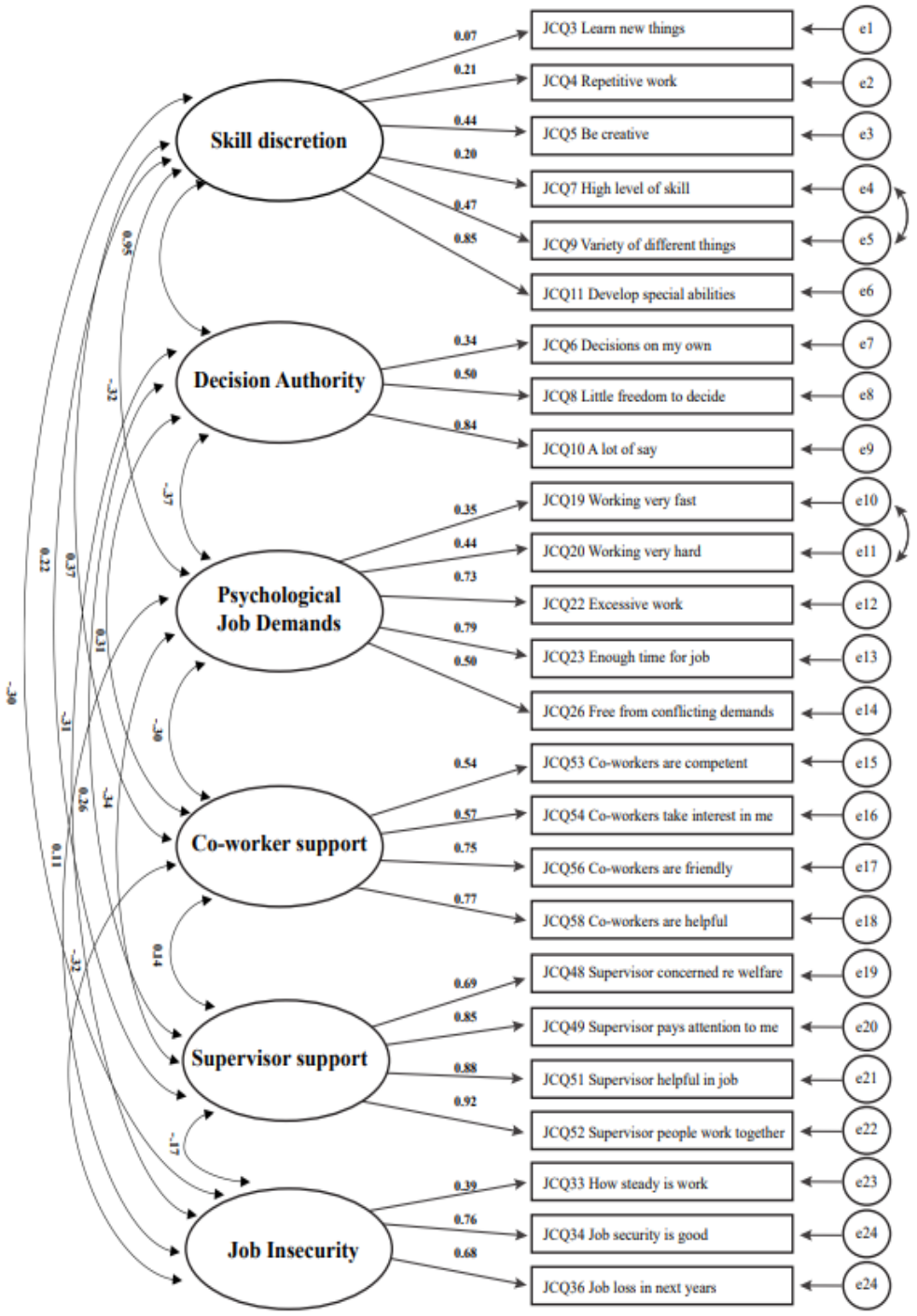
Model One Fit Summary

Model fit summary	Model One	Model One (Following covariance of errors)
Chi-square	428.45 (p<.000)	377.59 (p<.000)
comparative fit index (CFI)	.86	.91
Tucker Lewis index (TFI)	.84	.89
PCLOSE	.32	.34
root mean square error of approximation (RMSEA)	.06	.05

Figure 5 below illustrates the standardised estimates of the factor loadings and covariance estimates between the six factors of Model One.

Figure 5

The Standardised Estimates of the Six-Factor JCQ Theoretical Model One



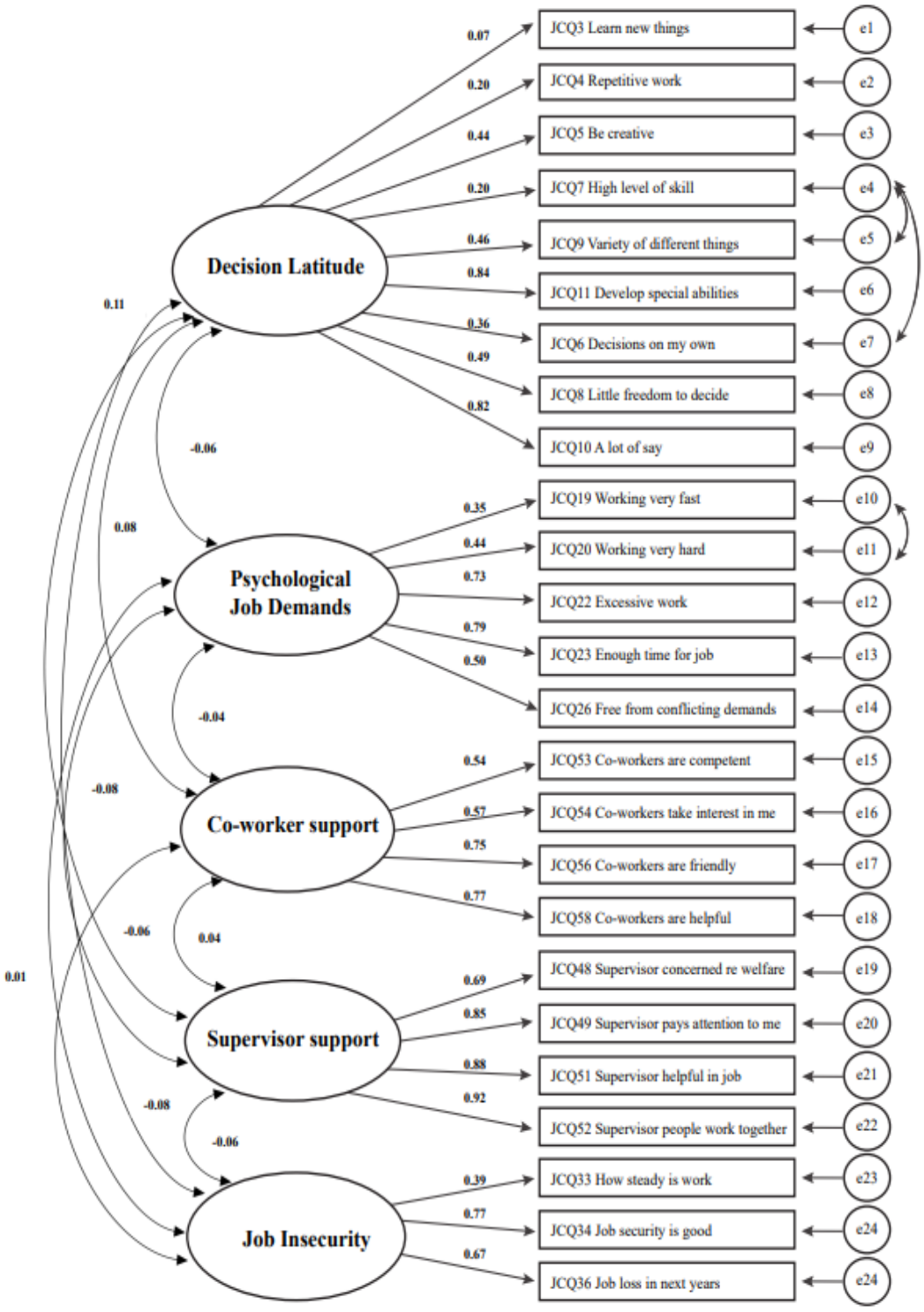
Model Two

Model Two combined skill discretion and decision authority sub-scales into a single *decision latitude* scal*e* while retaining the covariance of measurement errors from Model One. Modification indices revealed a high covariance (22.56) between item "My job requires a high level of skill" (Q7) and item "My job allows me to make a lot of decisions on my own" (Q6) within the *decision latitude* construct. To assess whether this modification improved the model fit, the measurement errors of these two indicators were covaried.

The results (see Table 8) show that Model Two goodness-of-fit statistics improved over Model One. The lower Chi-square test value of 353.29 significant (p<.000), the CFI increased to above .90, reaching .93, and RMSEA remained at an acceptable level of .05. Figure 6 below illustrates the standardised estimates of the JCQ five-factor Model Two.

Figure 6

Standardised Estimates of the JCQ Five-Factor Model Two



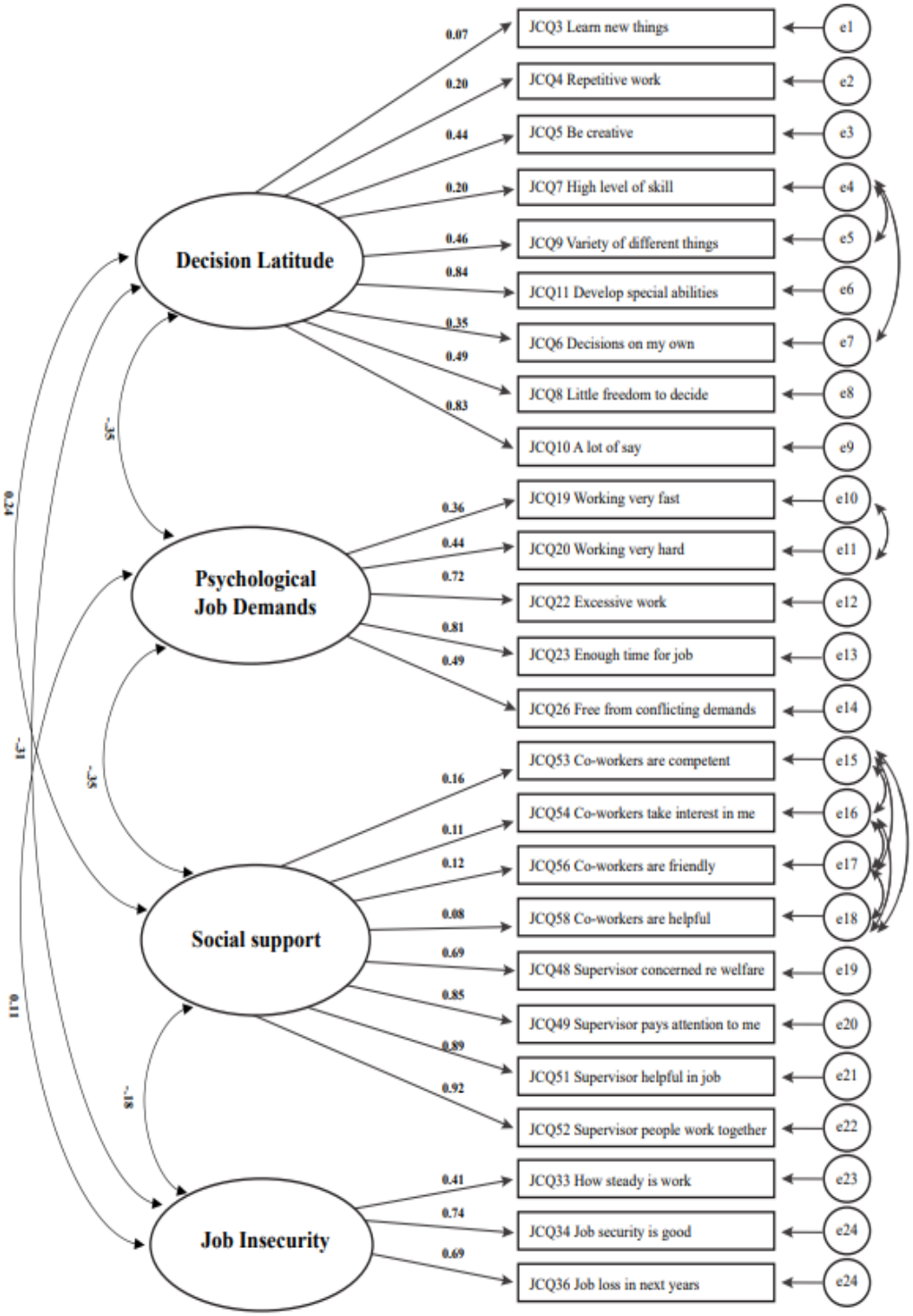
Model Three

In Model Three, the four-factor solution combined the two sub-scales, *co-worker* and *supervisor support*, into a single *social support* scale while retaining the covariance of measurement errors from Model One and Model Two. Modification indices revealed high covariance between item "People I work with are competent in doing their jobs" (Q53) and three other items "People I work with take a personal interest in me" (Q54) (26.42), "People I work with are friendly" (Q56) (16.86), and "People I work with are helpful in getting the job done" (Q58) (3.31). Additional high covariances were identified between Q54 and both Q58 at 25.86 and Q56 at 28.54, as well as Q56 and Q58 at 61.29. Hence, to assess whether these modifications improved the model fit, the measurement errors of the six indicators were covaried.

The results (see Table 8) indicate that Model Three's goodness-of-fit statistics did not show further improvement from Model Two. The higher Chi-square test was 364.37 and remained significant ($p<.001$), and there were no improvements in the CFI and RMSEA results compared to Model Two. Figure 7 depicts the four-factor Model Three for the studied population.

Figure 7

Standardised Estimates of the Four-Factor Model Three



To conclude, the model fit indices of the five-factor Model Two indicate that it is the best-fitted model for the studied population of NPs in NZ. This is evident from the model fit summaries in Table 8, which compare the fit of all three models.

Table 8

Model Fit Summary for Models One, Two, and Three

Model fit summary	Model One	Model Two	Model Three
Chi-square	377.59 (p<.001)	353.29 (p<.001)	364.37 (p<.001)
comparative fit index (CFI)	.906	.929	.918
Tucker Lewis index (TFI)	.891	.918	.906
PCLOSE	.349	.721	.552
root mean square error of approximation (RMSEA)	.053	.046	.049

As Model Two is deemed the best-fitting model in this study, the interpretation of factor loadings (i.e., the correlation between the item and its corresponding factor or construct) will focus solely on this model. The interpretation of factor loading follows the previous explanation in the data analysis plan, where higher loadings indicate that an item is a more robust measure of the corresponding factor or construct. Reviewing the standardised item loadings for Model Two (refer to Figure 6), it becomes evident that certain items had relatively lower factor loadings within the *decision latitude* scale.

Specifically, the items "My job requires that I learn new things" (Q3) (.07), "My job involves a lot of repetitive work" (Q4) (.20) and "My job requires a high level of skill" (Q7) (.20) displayed the lowest factor loadings. These items did not achieve the acceptable threshold of .32 or above, which indicates a weaker relationship with the underlying construct.

On the other hand, the remaining six items in the *decision latitude* construct reached exhibited loadings ranging from poor (above .32) to excellent (above .71). Notably, the item "My job allows me to make a lot of decisions on my own" (Q6) had a relatively poor loading of .36 within *decision latitude* construct. Additionally, the item "My job requires working very fast" (Q19) in the *psychological job demands* construct and the item "How steady is your work?" (Q33) also displayed a moderate loading of .35 and .39, respectively.

Excellent factor loadings (above .71) were observed for the following items within the *decision latitude* construct: "I have a lot to say about what happens on my job" (Q10) (.82) and "I have an opportunity to develop my own special abilities" (Q11) (.84). These high factor loadings indicate a strong association between these items and the *decision latitude* construct.

In the *supervisor support* sub-scale, the three items displayed the highest loadings, "My supervisor pays attention to what I am saying" (Q49) (.85), "My supervisor is helpful in getting the job done" (Q51) (.88), and "My supervisor is successful in getting the people to work

together" (Q52) (.92). These substantial factor loadings suggest a robust association between these items and the *supervisor support* sub-scale.

Notably, the highest factor loadings were found within the *supervisor support* factor, while the lowest was within the *decision latitude* construct. All scale factor loadings, except for the *decision latitude* construct, reached the acceptable range above .32, indicating a satisfactory association level with their respective constructs.

Regression Analysis

Linear regression analyses were conducted to establish the strength of the relationships between *social support* and *decision latitude* and *psychological job demands* and *decision latitude*, respectively. These analyses aimed to determine the extent to which *social support* and *psychological job demands* explain the variance in *decision latitude*. The statistical software used for these analyses was SPSS version 28™ (IBM®, 2021).

To investigate the potential mediation effect, Model 4 by Hayes (2022) was used in SPSS version 28™ (IBM®, 2021). The mediation process aimed to establish whether a relationship exists between *social support* and *customer relationships* and whether this relationship is influenced by the degree of freedom NPs have in making decisions about their practice. Furthermore, the moderation process of Model 1 (Hayes, 2022) was applied in SPSS version 28™ (IBM®, 2021) to explore whether there is a relationship between work commitment and job security for NPs that are conditional on the geographical location of the practice.

Linear Regression

Research Question One

"Does support from colleagues and/or supervisors influence NPs' freedom to make decisions about practice?"

As a linear relationship between the outcome and explanatory variables is necessary, the assumption of linearity of the model was tested to determine whether a significant linear relationship exists between *social support* and *decision latitude*. The results were found to be significant (p=.002), indicating the presence of a linear relationship. Subsequently, the model was tested by running the bootstrap using 1000 iterations and a 95% confidence interval level.

The results of the bootstrap analysis showed that *social support* explained 5.9% of variance (R^2 = .059) in *decision latitude*, and this relationship was found to be statistically significant p = .002, 95% CI [0.21, 0.87]. To ensure that the assumptions of normality were met, it was checked using a normal p-p plot (see Figure 8). The plot reveals that the residuals are normally distributed as the points lie in a straight line, indicating no major deviations from normality. Moreover, homoscedasticity was assessed with a scatterplot (see Figure 9), which showed that the residuals were roughly distributed in a rectangular pattern, with most scores concentrated in the centre along the 0-point line. This observation suggests that the residuals

exhibit homoscedasticity. Additionally, the results highlighted that *social support* is significant and positively explains variation in *decision latitude* (see Table 9). In other words, participants who reported higher levels of social support also perceived themselves to have more decision latitude.

Figure 8

Normal Probability Plot of the Regression Standardised Residuals (Social Support as a Predictor)

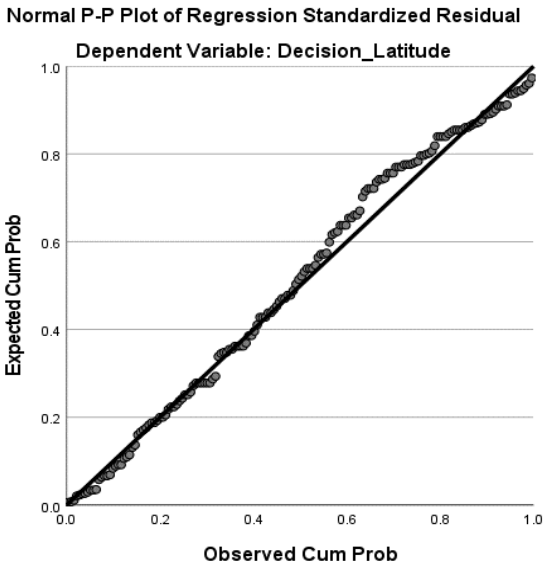


Figure 9

Residuals Scatterplot with Social Support as a Predictor Variable

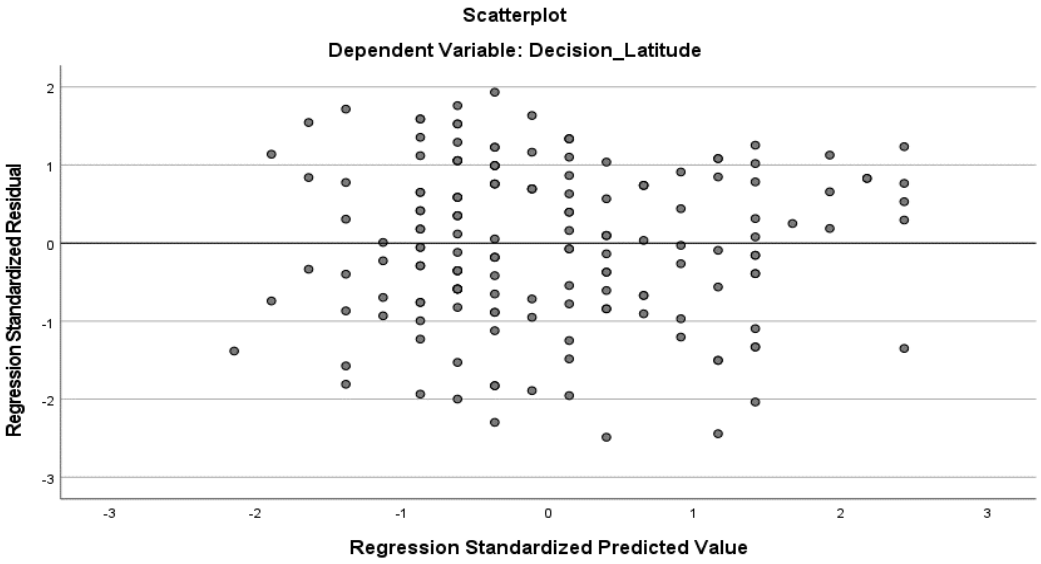


Table 9

Model Parameters

Variables	B	SE B	β	*p*	95% CI	
					Lower bound	**Upper bound**
1) Decision latitude	66.050	4.478		<.001	57.209	74.892
-*social support*	.540	.168	.243	<.01	.209	.871

Note. Unstandardized Beta (B), Standard Error of Beta (SE B), Standardized Beta (β), *p*-values, 95% Confidence Interval (CI) with Lower and Upper Bound with Social Support Entered as the Explanatory Variable and Decision Latitude Entered as Outcome Variable

Further exploration of the research question was undertaken to determine whether *co-worker* or *supervisor support* plays a more important role when explaining any variance in *decision latitude*. However, since no significant linear relationship was found between *supervisor support* and *decision latitude* (p=.06), it was decided only to enter *co-worker support* as a predictor. This decision was made because *co-worker support* does exhibit a significant linear relationship with *decision latitude* (p<.001). The results of the model's overall fit revealed that *co-worker support* explained 8.4% of the variance (R^2=.084) in *decision latitude,* and this relationship reached statistical significance (p<.001). The confidence limits ranged from a lower bound of .80 to an upper bound of 2.44.

As *co-worker support* is now entered into the model as an explanatory variable (replacing *social support* as in the previously mentioned regression analysis), the assumptions of normality were again checked with a normal p-p plot (see Figure 10), indicating that residuals are lying in a relatively straight line. Homoscedasticity was checked with a scatterplot, as displayed in Figure 11. Although the residuals mainly concentrated towards the zero line and appeared to be rectangular, a Breusch Pagan was conducted to confirm that there is no violation of the assumption of homoscedasticity. The test produced a non-significant result (p=.06), indicating that the residuals were not significantly influenced by the explanatory variable (i.e., *co-worker support*) and remained constant.

As shown in Table 10, the results indicate that *co-worker support* had a significant and positive relationship with *decision latitude*. This finding suggests that participants who report having higher levels of *co-worker support* also perceive themselves to have greater *decision latitude* in their roles. On the other hand, *supervisor support* does not demonstrate a significant relationship with *decision latitude* in the present study. Consequently, it is reasonable to conclude that, in this sample of NPs, *co-worker support* plays a more important role in the

perception of *decision latitude* than *supervisor support*. This finding contrasts previous studies (Amost & Laschinger, 2005; Chen et al., 2016; Hu et al., 2018), where *supervisor support* has been highlighted as a more critical factor in *decision latitude*.

Figure 10

Normal Probability Plot of the Regression Standardised Residuals (Co-Worker Support as a Predictor)

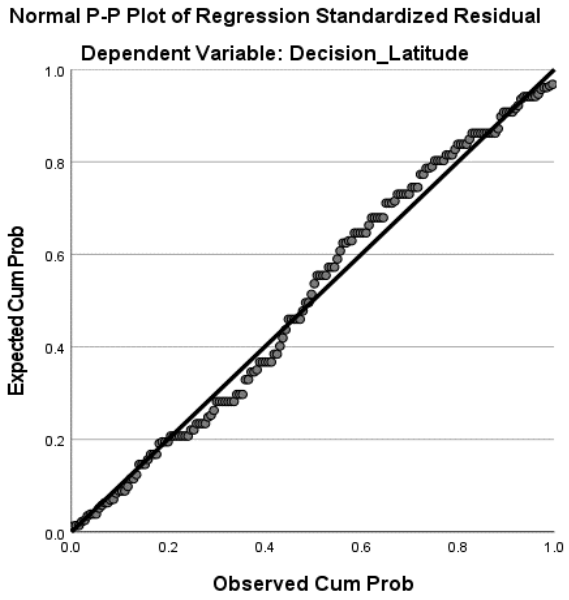


Figure 11

Residuals Scatterplot with Co-Worker Support as a Predictor Variable

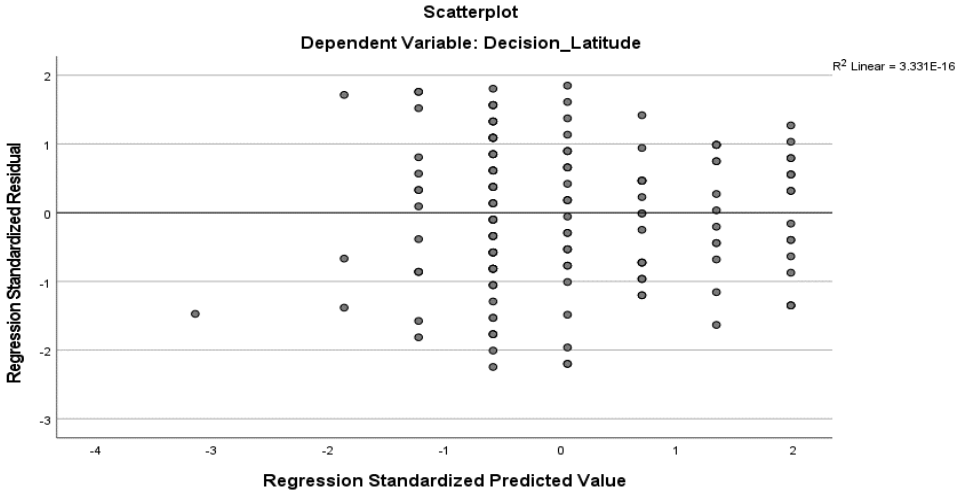


Table 10

Model Parameters

Variables	B	SE B	β	*p*	95% CI	
					Lower bound	Upper bound
2) Decision Latitude	59.393	5.407		<.001	48.717	7.069
-*co-worker support*	1.621	.416	.290	<.001	.800	2.442

Note. Unstandardised Beta (B), Standard Error of Beta (SE B), Standardised Beta (β), *p*-values, 95% Confidence Interval (CI) with Lower and Upper Bound with Co-Worker Support Entered as the Predictor and Decision Latitude Entered as the Outcome Variable

Research Question Two

"Is there a relationship between social support and NP-patient relationships, and does the freedom to make decisions about practice influence this relationship?"

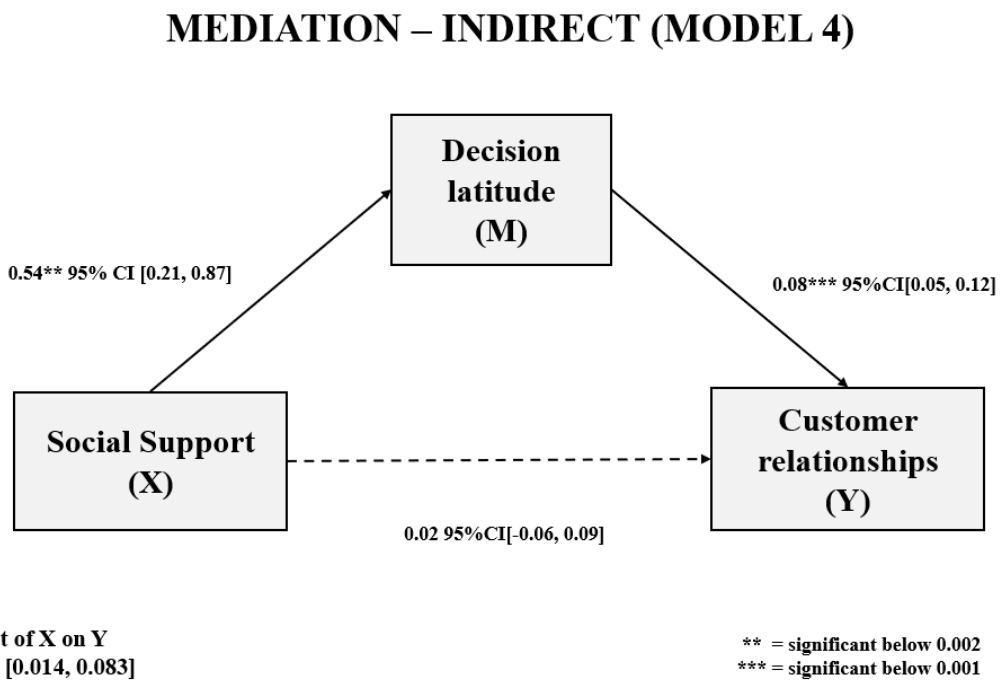
The present study was interested in assessing whether a relationship between *social support* and *customer relationships* could be explained by their relationship with *decision latitude* (i.e., whether *decision latitude* plays a mediating role).

Mediation. The mediation model was tested using Process, Model 4, a macro in SPSS v.28™ (Hayes, 2022). In this model, *customer relationships* was entered as the outcome variable (Y), *social support* as the explanatory variable (X), and *decision latitude* as a mediator variable (M). The results further revealed that *social support* does not have a direct relationship with *customer relationships*, *b*=.02, *t*=.47, *p*=.641, 95% CI [-.06, .09], but *decision latitude* directly and significantly relates to *customer relationships b*=.08, *t*=4.61, *p* <.001, 95% CI [.05, .12]. According to the confidence interval results, the indirect effect of *social support* (M) on the relationship between *social support* (X) and *customer relationships* (Y) was found to be significant (*b*=.045, 95% CI [.014, .083]). Therefore, these findings support the idea that *decision latitude* mediates the relationship between *social support* and *customer relationships*.

Figure 12 depicts the relationships in the model, demonstrating that as the perception of *social support* increases, there is a corresponding increase in *decision latitude*, positively affecting the NPs' relationships with their patients. In other words, NPs who perceive greater *social support* also perceive themselves to have a higher *decision latitude*, leading to their perceived improved relationships with customers (*p*<.002). The results further indicated that having more *social support* alone does not directly influence *customer relationships* (*p*<.642) unless their perceived *decision latitude* is improved (*p*≤=.001).

Figure 12

Mediation- The Indirect Effect of Decision Latitude on the Relationship Between Social Support and Customer Relationships



Research Question Three

"Are the demands of performing a role associated with NPs' freedom to make decisions about practice?"

No significant association was found between *psychological job demands* and *decision latitude* (*p*=.600). Consequently, it was not possible to test whether *psychological job demands* explained any variation in *decision latitude*. Based on the results of the inter-correlation analysis (see Table 5), it is safe to conclude that in the present study, *psychological job demands* do not significantly associate with any of the constructs and sub-scales.

Research Question Four

"Is the geographical location of practice associated with the freedom that NPs have in making decisions about practice?"

A one-way analysis of variance (ANOVA) was initially planned to address this research question, as there were three geographical location groups: rural, small urban, and metropolitan. However, upon closer examination of the sample sizes for the rural and small urban groups, it was observed that only three participants reported living in rural areas. In comparison, 34 participants reported living in small urban regions. In contrast, 120 participants reported living in a metropolitan area. Due to the limited number of participants in the rural group, it was decided to combine the small urban and rural locations into one category.

Consequently, an independent samples *t*-test was conducted, comparing two means from different groups of entities, precisely in this study, two geographical locations, rural/small urban and metropolitan. The purpose was to determine whether there is a significant difference between NPs practicing in rural/ small urban and metropolitan regions on their perceived *decision latitude*.

The *t*-test results showed no significant difference in mean self-reported *decision latitude* $t(155)=.91$, $p=.375$, CI[-1.77;4.78], $d=.17$; between participants practicing in metropolitan (M=8.53, SD=8.75) and participants who practice in small urban and rural areas (M=79.03, SD=9.01). Therefore, regardless of geographical location, the NPs in the present study reported similar levels of perceived *decision latitude*.

Research Question Five

"Is there a relationship between work commitment and job security for NPs, and if so, does the geographical location moderate this relationship?"

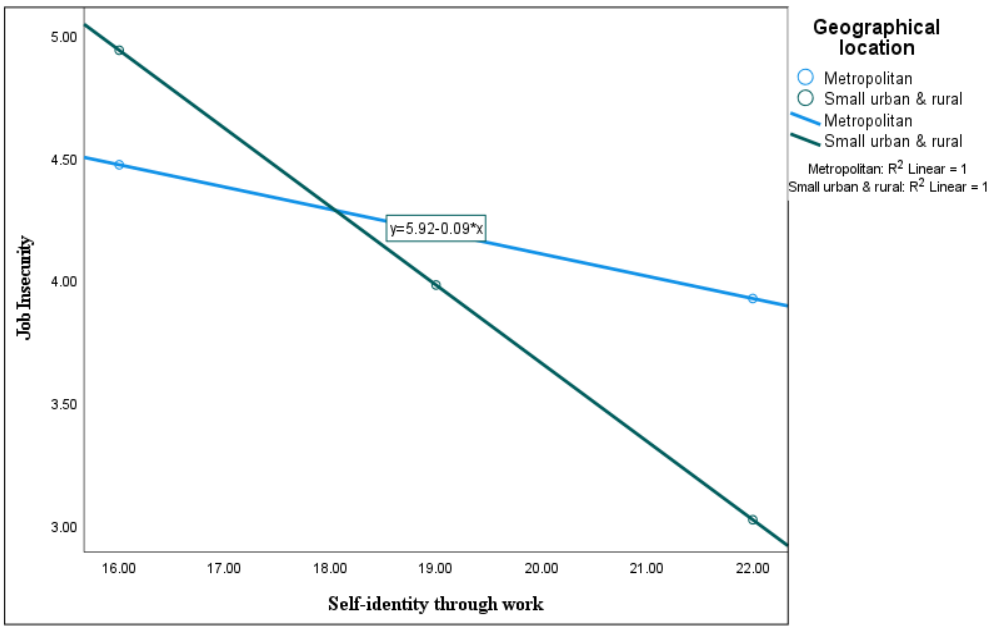
Moderation. It has been previously established that there was no significant difference in reported levels of *decision latitude* between participants living in metropolitan areas and those residing in rural/small urban areas. Moving forward, a moderation model was tested using PROCESS, Model 1 (Hayes, 2022)), entering *job insecurity* as the outcome variable (Y), *self-identity through work* as the explanatory variable (X), and geographical location: metropolitan (coded 1) and rural (coded 0) as a moderator variable (W).

Results of the moderation model indicated that the model was significant, $F(3,151) = 5.16$, $p<.01$, and predicted a 9.3% variance in *job insecurity* ($R^2=.093$). There was a significant interaction between *self-identity through work* and geographical location, $b=.23$, $t=-2.15$, $p<.05$, 95% CI [.44, .02,]. Furthermore, the results indicated that *self-identity through work*, $b=-.32$, $t=-3.53$, $p<.01$, 95% CI [-.50, -.14] and the geographical location, $b=-4.12$, $t=-2.10$, $p = .04$, 95% CI [-7.99, -.25] had a significant direct relationship with *job insecurity*.

Analysing the conditional effects, it became evident that the negative relationship between *self-identity through work* and *job insecurity* (i.e., the more *self-identity* the participants reported, the less *job insecurity* was reported) was significant for the participants in the rural areas, $b=-.32$, $t=-3.54$, $p < .001$, 95% CI [-.50, -.14], but not for participants in the metropolitan regions, $b=-.09$, $t=-1.63$, $p = .11$, 95% CI [-.20, .02]. These findings indicated that the significant relationship between *self-identity through work* and *job insecurity* is dependent on the location of the NPs. Specifically, this relationship is only significant for NPs in rural areas.

Figure 13

The Interaction Effect of Geographical Location on Job Insecurity and Self-Identity Through Work



By examining the interaction graph (Figure 13), we can observe that the participants in rural areas who scored higher on *self-identity through work* reported lower levels of *job insecurity*. On the other hand, for participants in metropolitan areas, a higher score on *self-identity through work* was associated with a slight decrease in *job insecurity*. Still, this decrease is significantly lower for participants from rural areas.

To summarise the moderation analysis, the conditional effect of geographical location on *self-identity through work* and negative *job insecurity* was found to be significant. Specifically, an increase in *self-identity through work* (feeling valued and appreciated) led to a greater reduction in *job insecurity* for NPs working in rural/small urban and rural regions compared to those in metropolitan areas.

Summary

The techniques used in this study included assessing the psychometric properties, such as scale reliability (coefficient α) and examining inter-correlations to identify significant associations between the sub-scales. To evaluate construct validity, CFA was performed on the similarity of factor structures in the studied population to the theoretical JCQ model. Among the three models tested, Model Two, a five-factor model comprising *decision latitude, psychological job demands, co-worker support, supervisor support*, and *job insecurity*, emerged as the best fit for the studied population. This indicates that the constructs measured by the JCQ exhibit construct validity in a population of NPs in NZ. Additionally, linear regression analyses

were conducted to determine the strength of the relationships between all the constructs of the JCQ.

Demographic data revealed that most respondents (*n*=169*)* were female of NZ European ethnicity, primarily between the ages of 40 and 59, and had been practicing as NPs for two to five years. Nearly half of the respondents worked in DHBs, with PHC being the next common specialty area. Regarding the geographical location of the main practice, the highest number of respondents practised in Auckland, with most NPs practicing in the North Island. Twenty percent of NPs reported practicing in small urban and rural areas with a population of less than 10,000.

In the first analysis, a reliability analysis using coefficient α was conducted for all items in the JCQ, yielding satisfactory results for all six constructs (above .60) except for *customer relationships* (.53). Inter-correlations between construct variables were measured using the Spearman test. Overall, the inter-correlation results indicate that *decision latitude* (freedom to make decisions) was significantly correlated with all the variables except for *psychological job demands*. The *psychological job demands* variable did not correlate significantly with any other variable, except for a negative correlation with *job insecurity* (-.21, p<.01).

Social support demonstrated strong correlations with *decision latitude* (.22, p<.01) and *decision authority* (.19, p<.05), suggesting a positive association between NP decision-making and autonomy with support from colleagues and supervisors or managers. *Job insecurity* had a significant but weak negative correlation with most of the variables, including *social support* (-.16, p<.05) and highest with *decision latitude* (-.22, p<.01) and the strongest correlation with *self-identity through work* (-.33, p<.01).

Confirmatory factor analysis and coefficient α confirmed the internal reliability and consistency of the constructs of this study. The results of CFA identified that the five-factor JCQ Model Two was the best fit for the studied population. Notably, the *supervisor support* sub-scale exhibited the highest factor loadings, while the *skill discretion* sub-scale showed the lowest. However, some low factor loadings were identified in CFA, specifically for the "Repetitive Work" item in the *decision latitude* construct and the "I am free from conflicting demands" item in the *psychological job demands* construct.

These findings align with previous studies (Hu et al., 2018; Niedhammer, 2002; Pelfrene et al., 2001). The "Repetitive Work" item has been reported as problematic on the *decision latitude* scale by Karasek et al. (1998) due to inconsistent and low loadings. The authors suggested this might be due to the skewed distribution, as repetitive work is more prevalent at the lowest occupational skill level. Considering the nature of NPs' roles, as they do not typically perform repetitive tasks, it is recommended that future research using the JCQ to assess the job demands of NPs in NZ considers removing or replacing the "Repetitive Work" item. This adjustment may significantly improve the goodness-of-fit of the structural model, as demonstrated in a previous study of health workers by Santos et al. (2017).

Linear regression analyses were conducted to address the research questions. Two linear regression models were utilised to examine the effects of *social support* on *decision latitude*. The results revealed that *social support* positively and significantly affected *decision latitude.* Moreover, the analysis indicated that *co-worker support*, rather than *supervisor support*, emerged as a positive and significant predictor of *decision latitude*. The mediation analysis was also conducted, and the findings indicated no direct relationship between *social support* and *customer relationships.* However, an indirect relationship was observed between these two constructs through the mediating variable, *decision latitude*. The results suggested that the more *social support* NPs have, the more *decision latitude* they perceive themselves to have, which in turn contributes to improved *customer relationships*.

The moderation analysis explored *job insecurity*, described as a lack of resources and control (*decision latitude*) at work and a lack of work commitment (*self-identity through work*). The results revealed that as *self-identity through work* increases, NPs experience lower levels of job insecurity. However, this relationship is conditional to NPs practicing in NZ's rural/ small urban areas. Moreover, an independent samples *t*-test examining the association between geographical location and *decision latitude* showed no significant difference between participants who reported practicing in metropolitan, small urban, and rural areas on their reported levels of *decision latitude*.

In summary, the research findings highlighted that the sample of NPs in NZ perceive themselves to have greater control over their decision-making when supported by their colleagues in practice rather than their supervisors. Moreover, NPs reported improved relationships with healthcare consumers when they feel increased support from their colleagues, and this positive effect is mediated by the enhanced sense of freedom they perceive to make decisions about their practice.

Importantly, there was no significant difference in perceived *decision latitude* between NPs practicing in rural/small urban areas and those in metropolitan regions, suggesting that geographical location does not significantly influence NPs' perceptions of decision-making autonomy. Furthermore, the results indicated that NPs who perceive themselves as valued and appreciated (*self-identity through work*) experience lower levels of *job insecurity*. However, this relationship is conditional to NPs practicing in NZ's rural/small urban areas. Furthermore, no association was found whether *psychological job demands* influence NPs' freedom to make decisions about their practice. The following chapter discusses the implications of these findings.

Chapter Six: Discussion and Conclusions

Introduction

The final chapter delves into how the research findings can inform changes and development of the Nurse Practitioner role in New Zealand. The discussion encompasses the government, workforce policy, and relevant literature. The key results are compared with non-comparable international studies, as no NZ-specific evidence exists. The implications of the current study's findings and recommendations for future NP practice are outlined. Moreover, the contributions to the global JDCS model and validation of the JCQ in New Zealand's NP population are presented, followed by overall conclusions.

Discussion of Key Findings

The results of this doctoral study indicate that collegial support is the most important determinant of the freedom that NPs have to make decisions about the means and methods of performing their role. In this section, I argue that this freedom can be interpreted as professional autonomy. I will define what professional autonomy means in the context of NP work and how this autonomy has flow-on effects on job satisfaction, workforce retention, and workforce planning.

Collegial Support and Nurse Practitioner Practice Autonomy

In this study, NPs reported a stronger sense of freedom to make decisions about their practice when they felt supported by their colleagues. This positive relationship found in the results might improve practice autonomy for NPs. It is important to note that the concept of NP autonomy is sometimes misunderstood among health professionals (Weiland, 2015). Peacock and Hernandez (2020) defined NP autonomy as utilising professional knowledge and expert clinical skills, having prescribing authority, taking responsibility for their practice, and engaging in unrestricted collaboration with an interdisciplinary health team.

Autonomy is critical for NPs to effectively fulfil their roles, particularly in PHC, where there are health workforce shortages (Carryer & Adams, 2017; Carryer & Yarwood, 2015). NPs in NZ are highly skilled health practitioners who work across healthcare settings with a broad scope of practice. According to the New Zealand Nurses Organisation (2020), advanced practice nursing involving collaboration and consultation with health professionals and policy decision-makers leads to positive change. Nurse Practitioners operate independently while collaborating within interdisciplinary environments, making their role integral to service planning and potentially improving health outcomes for the NZ population.

To fully support advanced practitioner roles like NPs, employers, regulatory authorities, and speciality groups must express their endorsement (Adams & Carryer, 2019, 2021). The College of Nurses Aotearoa NZ (2019) has recognised the significance of supporting the NP role in workforce development to enhance equity and access to competent and safe healthcare.

Autonomy holds immense value for NPs, enabling them to practice independently within their specialised area, utilising their advanced education and clinical training. The finding from the current study is particularly significant as it demonstrates that having collegial support positively influences NPs' decision latitude and, consequently, their autonomy.

The present study reveals that NPs perceived an increase in decision latitude when supported by their colleagues, as opposed to their supervisors. This finding contradicts previous JCQ research in the general nursing population, where managerial and supervisory support was often considered more crucial, leading to increased job satisfaction (Amin et al., 2015; Baba et al., 2013; Bagheri et al., 2017; Bagheri et al., 2021; Gao et al., 2017; Orgambidez & Almeida, 2020; Sasaki et al., 2020). Dissatisfaction among nurses was associated with higher job turnover rates, which negatively impacted the health workforce resources in healthcare organisations and posed challenges to delivering safe care (Poghosyan et al., 2022). In primary healthcare, continuity of care was associated with improved quality of care and patient outcomes. As highlighted by Sabety et al. (2021), the high turnover of PHC clinicians disrupts patient-care relationships, potentially diminishing health outcomes and increasing the use of urgent and emergency care services.

Dery et al. (2022) emphasised the significant influence of organisational support on various aspects of nurses' practice. This support correlated with nurses working at the top of their scope of practice, having control over their tasks, and the ability to make decisions. Optimising nurses to practice at the highest scope level was crucial for improving organisational performance, enhancing patient care, and boosting nurses' job satisfaction. High levels of job satisfaction were found to improve nurse retention, identified by Duffield et al. (2014) as a critical issue impacting many healthcare systems globally, emphasising the importance of nurse retention. The high turnover of nurses had negative cost implications for healthcare budgets worldwide. A large cross-sectional study of NPs conducted by Poghosyan et al. (2022) highlighted that organisational leaders should focus on creating better work environments associated with higher job satisfaction and retention for NPs. Better work environments were defined as improving support and resources for NP roles and involving NPs in organisational decisions. Furthermore, perceived support from managers was found to positively impact nurses' commitment to the organisation and effectively reduce nurse turnover (Garrosa et al., 2011; Gutierrez et al., 2012).

Despite these findings related to the importance of supervisory/managerial support, the present study revealed that supervisory support did not significantly relate to decision latitude, while collegial support improved NPs' ability to make decisions about practice. Furthermore, it was found that this positive relationship between collegial support and freedom to make decisions, in turn, improved NPs' perception of their relationship with healthcare consumers.

This novel finding within the NZ context highlights the significance of collegial support in enhancing NPs' autonomy and decision-making, which, in turn, positively affects their

relationship with healthcare consumers. These results could have important implications for developing health service policies that incorporate NP practice and lead to improved health service delivery. The Nurse Practitioner workforce is central to achieving the policy and equity goals of the *NZ Health Strategy* and health system reforms. Consequently, health service workforce policy should include the development of the NP workforce and provide direction for successfully integrating the NP role. This involves promoting the integration of NPs into interdisciplinary teams, focusing on improved healthcare outcomes, providing high-quality care, and improving access to health services for the population.

The current NZ health system reforms are centred around achieving equity in health outcomes. However, significant disparities persist in access and outcomes for Māori, Pacific Island, and low-income populations. Additionally, momentum has been lost in providing innovative and accessible primary healthcare for high-needs and marginalised populations (Ministry of Health, 2015b). Consequently, the existing health system has been unable to deliver equitable health outcomes for all population groups (Goodyear-Smith & Ashton, 2019). To address these challenges, Gauld (2016) proposed a part of the solution to involve shifting the primary care general practice model from doctor exclusivity and encouraging greater involvement of NPs in delivering accessible healthcare services, especially in rural and marginalised communities. This transition would necessitate improved system integration and enhanced coordination among various health professional groups.

The government's support and recognition of NPs' role as autonomous, safe health professionals and a part of the solution to the health workforce crisis are essential in achieving improved outcomes for healthcare consumers. The ageing workforce of NZ's doctors, with 47% planning to retire in the next 10 years and 27% within the next five years, poses a significant challenge for the health system (Goodyear-Smith & Ashton, 2019). Considering that nursing constitutes the largest health workforce in NZ, with 54,456 practicing nurses in 2019, as reported by the NCNZ (2020b), strategies structuring, and focused efforts can be undertaken to meet the future demands of multi-morbidity community-based care. Training nurses towards advanced practice, such as the NP pathway, is imperative to achieve this. In the later sections of this chapter, recommendations are discussed for improved training models to strengthen the NP workforce and address the evolving healthcare needs of the population.

The influence of social support on NP decision-making has been understudied in international literature; however, considering it in contrast with the current research is crucial. Encouragingly, similar to the findings of this study, research on NPs in Taiwan (Chen et al., 2016; Hu et al., 2018; Yang et al., 2021) and NPs in Canada (Amost & Laschinger, 2005) has shown that collegial support, encompassing support from doctors, allied health professionals, and nurses, has a significant positive impact on their decision-making ability and autonomy in practice. It is worth noting that the three Taiwanese studies (Chen et al., 2016; Hu et al., 2018; Yang et al., 2021) were conducted in large public hospitals, whereas the Canadian study (Amost

& Laschinger, 2005) encompassed both acute hospital and primary healthcare settings. The Canadian study revealed that the number of individuals within the workplace positively impacted NPs' autonomy, decision-making ability, visibility, and perceived social support. Notably, NPs in smaller community based PHC settings reported stronger collaborative relationships with their colleagues, contributing to a sense of empowerment. In contrast, larger work settings were perceived to be controlled by physicians, leading to NPs feeling lost within the organisational hierarchy, experiencing limited recognition, and lacking control over their decision-making ability.

The Canadian NP study conducted by Amost and Laschinger (2005) highlighted a significant finding regarding the influence of practice settings on NP practice. Specifically, the study found that NPs working in smaller settings, such as PHC, experienced more support and conducive conditions for their practice than those in public hospitals. Working in smaller settings, such as primary healthcare, was more helpful and conducive to their practice when compared to public hospitals. The advantages of PHC practice may contribute to enhanced autonomy and collaboration with colleagues, thereby facilitating a more comprehensive approach to healthcare for consumers. Such an approach is essential when caring for individuals with complex and long-term conditions, as it focuses on integrating health services around the person's specific needs. The Canadian study's proposal that perceived supportive and collegial relationships are crucial in enhancing NP autonomy and empowerment aligns with the present study's findings. Both studies underscore the significance of collegial support in influencing NP decision-making and practice autonomy.

The present study provides evidence supporting the importance of healthcare team support in establishing and maintaining effective NP roles while promoting NP job satisfaction. This finding aligns with previous research conducted in Australia, which also emphasised the significance of interprofessional support, particularly collegial support, in facilitating the successful integration of NPs within healthcare teams (Arendts et al., 2018; Forbes et al., 2018; Lowe et al., 2013). As a result, job satisfaction for NPs was directly associated with professional autonomy and, therefore, improved decision-making ability and empowerment to control clinical practice outcomes (De Milt et al., 2011). Erenstein and McCaffrey (2007) further emphasised that exercising control over decision-making and clinical practice increased NP autonomy, resulting in higher job satisfaction and retention in the work setting.

In the United States, studies exploring collegial support for NPs in PHC demonstrated that NPs experienced higher job satisfaction when they felt a sense of intra-practice partnership and collegiality. This feeling of being valued, working as part of a team, and providing specialised care within their scope of practice contributed to NPs' overall satisfaction as direct care providers (Poghosyan et al., 2022; Poghosyan & Liu, 2016). These findings suggest that fostering collegial support and interprofessional collaboration are essential elements for

supporting NPs in their roles, enhancing their autonomy, and promoting job satisfaction, ultimately contributing to NP practice's effectiveness and sustainability.

The findings of the present study of NPs in NZ offer a new understanding of the value of perceived collegial rather than supervisory or managerial support. A supportive and collegial environment that appears more conducive to NP practice might enable greater autonomy. This finding holds significant implications when designing future health services to ensure a stable NP workforce, especially in the context of existing health workforce shortages. Despite the challenges posed by health workforce shortages in NZ, there was an identified struggle for NPs to establish their NP-led practice in primary care, especially in high-need, rural, and Māori communities. The lack of government support and national policy guidance has hindered their progress in these areas (Adams, Mustafa, et al., 2022).

Additionally, the lack of understanding regarding the scope and role of NPs among colleagues, managers, and healthcare consumers has contributed to organisational challenges and a lack of visibility and progression for the NP role, as noted in the literature review of this study. Addressing these issues and promoting a supportive and collegial environment may be instrumental in overcoming the barriers NPs face and optimising their contributions to healthcare delivery in diverse communities across NZ. Policymakers and healthcare organisations should consider implementing strategies to enhance collegial support and improve awareness and recognition of the NP role to strengthen the NP workforce and ultimately enhance patient care outcomes.

Earlier studies conducted in NZ have highlighted the positive impact of NP collaborative practice on patient health outcomes, including reduced re-admissions to acute care and improved access to healthcare (Carryer & Adams, 2017; Forbes et al., 2018; Gagan et al., 2014; Gagan & Maybee, 2011; Harvey, 2015; Pirret, 2008). Given the ongoing health workforce shortages in NZ, it is imperative to recognise NPs as a valuable part of the solution. Nurse Practitioners can contribute effectively as members of a collegial team within an established practice or as independent practitioners and need to be recognised as part of the solution to the health workforce shortages, whether as part of a collegial team in an established practice or autonomous NP-led primary health service providers. Adams and Carryer (2021) emphasised that government policy and health sector reforms must embrace and support the NP role, particularly in areas facing high need, such as rural and Māori communities in NZ. To effectively address the challenges and opportunities the NP workforce presents, this study will further discuss the recommendations for government health workforce policy and funding later in this chapter.

The international evidence strongly suggests that professional autonomy is causally linked to role satisfaction, which, in turn, influences the intention to remain in the profession. The findings of this research further support this notion, indicating that NPs experience increased job satisfaction when they have more collegial support. In this section, I argue that

addressing the workforce shortages requires a policy and practice focus on developing professional and collegial networks for NPs. By fostering a supportive and collaborative environment, NPs are more likely to experience higher job satisfaction, leading to better professional retention.

Social Support and Nurse Practitioner-Patient Relationships

The current study revealed that a supportive work environment empowers NPs, granting them greater control over their work and leading to improved patient relationships. The findings suggest that a supportive work environment is crucial in enabling NPs to have more control over their work, positively influencing their perception of improved patient relationships. Patient satisfaction has been linked to various factors in the nurses' work environment, including the care delivery model, the practice size, and nurses' autonomy. A good work environment for nurses was a defining factor for higher patient satisfaction with the health service. Factors such as supportive professional relationships and autonomy contribute to nurses' job satisfaction and, in turn, impact patient satisfaction (Copanitsanou et al., 2017).

The results of this study supported the PCC model of care in the context of NP practice. Nurse Practitioners were found to provide specialised, collaborative PCC care, fostering meaningful relationships between healthcare providers and consumers through ethical principles. The principles included autonomy, valuing respect for the person, the right to self-determination, and mutual understanding (Van Diepen et al., 2022). The person-centred model of care has been recognised by the WHO (2015) as a model that improves healthcare outcomes and is recommended for adoption by health professionals and organisations. It fosters positive relationships between health professionals and patients, emphasising respect and mutual understanding.

The person-centred work environment empowered NPs with more control over their work and decision-making, allowing for providing care that aligns better with the patient's needs. This work environment also facilitated support in the interdisciplinary team, resulting in improved relationships with healthcare consumers (Van Diepen et al., 2022). These findings align closely with the current study's results, which indicated that a supportive work environment afforded NPs greater control over their work, leading to a perception of better relationships with patients (healthcare consumers). This novel finding, specific to the NZ context, has significant implications for informing the development of health service policies that recognise and incorporate NP practice, ultimately enhancing service delivery.

Rural Versus Metropolitan Nurse Practitioner Practice

The present study also aimed to determine whether geographical location influenced NPs' freedom to make decisions. The current study found no significant difference between NPs practicing in rural/small urban and metropolitan regions in NZ concerning their perceived decision latitude. The results revealed no significant difference in mean self-reported decision

latitude between participants practicing in metropolitan and those practising in rural or small urban areas (population of less than 10,000).

In contrast, the evidence from the United States (US) has indicated that rural NPs had higher job satisfaction, autonomy, and ability to make decisions about practice compared to non-rural NPs (Bae, 2016; Spetz et al., 2017). In the United States, rural NPs were not restricted in their scope of practice, which was an important factor in determining job satisfaction and autonomy. Conversely, NPs in metropolitan areas were often limited to working under the supervision of a physician in primary care. Notably, the NP role was established in the US 57 years ago, and the full scope of practice is only provided in 21 out of 50 states (Ohio Association of Advanced Practice Nurses, 2022). In contrast, NPs in NZ have unrestricted authority to practice nationally in their specialised practice area. This difference could be attributed to NZ NPs having full practice autonomy and the ability to make decisions about practice in rural or metropolitan areas, which likely contributes to higher job satisfaction and greater intention to stay. Significant political, legislative, and cultural distinctions exist between the US and NZ, potentially influencing how NP roles are perceived and integrated into the healthcare system.

Rural NPs in the international context have successfully operated primary care practices in underserved, indigenous, and marginalised communities (Kooienga & Carryer, 2015; Xue & Intrator, 2016). Their significant contributions to marginalised populations through a unique PCC approach focused on community health, prevention, and social well-being have been evident (Xue & Intrator, 2016). The ongoing shortage of healthcare workforce in rural locations and the impending workforce depletion due to retirements are expected to increase the pressure on the current healthcare system. Concerns about the rising numbers of long-term conditions, inequities in access to healthcare, and inadequate investment in child and youth health in NZ have been voiced over the last decade, with NPs being identified as a significant part of a solution for a health system in crisis (Adams et al., 2020; Adams & Carryer, 2019; Carryer & Adams, 2017, 2020; Carryer et al., 2011; Carryer et al., 2018; Gagan et al., 2014; Gagan & Maybee, 2011; Sheridan et al., 2011; Smith et al., 2019). Both rural and urban NPs in NZ have the freedom to make decisions about their practice and can provide appropriate health services to healthcare consumers. This autonomy and ability to tailor their care to meet the specific needs of the communities they serve position NPs as essential players in addressing the healthcare challenges faced by rural and marginalised populations in NZ.

Although results showed no effect of location on the freedom to make decisions, it was essential to investigate whether location might play a role in other constructs measured by the JCQ. As a result, the study investigated the relationship between self-identity through work and job insecurity for NPs and whether the geographical location of their practice had a role in this relationship. The findings revealed that when NPs perceive themselves as valued and appreciated (self-identity through work), the less the NPs feel insecure in their jobs. However,

this relationship was conditional to the NPs practicing in rural/small urban areas in NZ. In other words, this relationship was not found for the nurses practising in metropolitan areas. Recent JDCS research has emphasised the importance of examining job insecurity in nursing and moderating variables such as emotional intelligence, positive leadership, and fair management (Prado-Gasco et al., 2021).

Job insecurity, as described by Kalil et al. (2010), refers to a lack of resources and control (decision latitude) at work and a lack of work commitment (self-identity through work). Yasin et al. (2020) argued that intrinsic factors such as personal achievement, job interest, and responsibility were the strongest predictors of job satisfaction and job security for nurses. Notably, these factors were higher among rural nurses than those in metropolitan regions, and the rural PHC setting offered NPs greater practice autonomy, especially in isolated areas.

These findings align with the conclusions of Spetz et al. (2017), who reported that US NPs practising in rural areas had higher job satisfaction, increased autonomy, and a greater intent to remain in their jobs as they were able to work to the fullest extent of their scope of practice. In the current study, it was observed that only rural NPs' self-identity through work contributed to a reduction in their job insecurity, while metropolitan NPs' self-identity did not significantly reduce their job insecurity. One plausible reason for this might be that rural NZ NPs are in higher demand, leading to an increased sense of self-identity through their professions as NPs, reducing the risk of job layoffs and enhancing job security. These findings parallel the results from Canadian studies of nurses by Yasin et al. (2020).

New Zealand's health system is facing significant challenges in delivering appropriate rural PHC services, given the high prevalence of long-term conditions, shortages of doctors, and health access inequities (Adams & Carryer, 2019). Nurse Practitioners with distinct professional characteristics in community settings are vital in addressing these challenges. Their attributes include collaboration, coordination of services, patient education, counselling, and advocacy by empowering patients and facilitating active involvement in managing known conditions during illness and rehabilitation. Nurse Practitioners make a difference in the care provided, diverging from the traditional biomedical model.

Grant et al. (2017) highlighted how these unique professional characteristics set NPs apart and position them as essential healthcare providers. Nurse Practitioners work with vulnerable populations, including individuals from diverse ethnicities, cultural backgrounds, socioeconomic disadvantages, remote locations, and different age and gender groups. Consequently, NPs are a crucial link between tertiary and community PHC services, ensuring continuity and comprehensive care for these populations. Nurse Practitioners in NZ can be part of the solution to the health system challenges, especially in PHC, residential aged care settings, and remote and rural communities.

Implications of Study and Recommendations

The results of this study provided the evidence base for the development of effective NP workforce models, policy, education, and future research. In this section, the author will demonstrate how the research findings have contributed to the global JDCS model research and expand the discussion about the JCQ research among nurses, including validating the JCQ in the population of NPs in NZ. Implications and recommendations for NP workforce planning, policy, and practice are discussed.

Contributions to Global Job Demand-Control-Support Model Research

The current cross-sectional study of NPs represents the first investigation of its kind, conducted in NZ based on the JDCS theory, utilising the JCQ. This study contributes to the research on NP's autonomy and ability to make decisions about the means and methods of performing their role. While the JCQ has been utilised since 1984 to assess the psychosocial working conditions of various professional roles, it has been relatively underused in studies examining the working conditions of nurses. However, in the last 40 years, nurses have been recognised as a group of health professionals susceptible to stress due to high job demands and low level of job control (Häusser et al., 2010; Niedhammer et al., 2020; Zeike et al., 2018).

Notably, the current study did not delve into job strain specifically in the population of NPs in NZ, as most of the existing JCQ nursing research focused on this aspect. Instead, this research filled an essential gap in the literature by shedding light on the freedom of decision-making among NPs in the specific context of NZ. By exploring the concept of decision latitude in this population, the study provides valuable insight into the professional empowerment and autonomy of NPs, adding to the understanding of their role within the healthcare system.

Internationally, early JCQ research indicated that nurses perceived themselves as experiencing high job strain and low social support. A study on stress in nurses working in Canada concluded that psychological job demands were excessive, reported poor supervisory support, and a lack of decision-making regarding the work environment (Bourbonnais & Mondor, 2001). Over the next decade of JCQ research in the nursing population, the importance of social support, particularly supervisory support, in decision-making, enabling autonomy in practice, and reducing work-related stress became evident. For example, a cross-sectional study conducted in four regions (China, Japan, Argentina, and the Caribbean) emphasised the significance of job control and supervisory support in mitigating stress among nurses (Baba et al., 2013). Many studies included other stress scales or questionnaires with the JCQ during this period, unlike the present research on NPs in NZ.

Perceived challenge-related stress was studied in Australian aged care nurses by Gao et al. (2017), who found that support from immediate supervisors was identified as the most effective intervention to reduce the nurses' stress related to job challenges. The study utilised a national nursing survey data set and included a combination of scales: the JCQ and Effort

Reward Imbalance Questionnaire. In a cross-sectional study conducted by Bagheri et al. (2021), ICU nurses working in public hospitals in Iran were examined, and it was identified that nurse job satisfaction was directly related to support from their supervisors. The tools utilised in the Iranian study were the JCQ and the Minnesota Satisfaction Questionnaire. Another Australian study focused on practice nurses in general practice and found that social support (collegial and supervisory support) improved practice nurse decision-making. This improvement in decision-making could enhance the recruitment and retention of nurses and promote interprofessional collaboration (Merrick et al., 2012). Notably, this original JCQ study was closely related to the current research on NPs in terms of scales and similar sample sizes. However, the findings from the JCQ studies in the early 2000s about nurses highlighted supervisory support as being more important and influential in their freedom to make decisions, which contrasts with the current research findings.

Since 2017, global research using the JDCS model in a population of nurses has continued to highlight the importance of perceived support from supervisors to enable nurses to make more decisions and exercise autonomy in their roles. Several international studies have confirmed this perception, emphasising the influential role of supervisory support in shaping nurses' decision latitude. For instance, a study in several European countries established that perceived supervisor support was significantly higher than perceived co-worker support. As a result, the authors recommended providing nurses with new protocols to control their daily activities (decision latitude), enhancing their freedom to make decisions and improving patient care (Navajas-Romero et al., 2020). Similarly, a Canadian study by Dery et al. (2022) concluded that perceived supervisory, rather than collegial support, optimised the nurses' autonomy and job satisfaction. Such support can have broader favourable implications for organisational performance and may aid in reducing absenteeism, especially in the current climate of high turnover and health workforce shortages.

The current study's findings provide a new understanding of the value of perceived collegial support, rather than supervisory support, for NPs in NZ. It indicates that a supportive, collegial environment is more conducive to NP practice, thereby contributing to the scarce research on the JDCS model within the NP population. Similarly, limited international JDCS studies focusing on NPs, particularly the influence of social support on decision-making, have consistently confirmed that collegial support has the most significant impact (Amost & Laschinger, 2005; Chen et al., 2016; Hu et al., 2018; Yang et al., 2021).

The study of acute-care NPs in Taiwan investigated the relationship between social support and perceived self-efficacy, which is associated with job performance. The NPs reported higher perceived collegial support from colleagues compared to support from supervisors. Interestingly, the researchers analysed the data further, categorising the NPs into low, medium, and high-salary groups to explore the association with perceived self-efficacy. The results indicated that NPs in the high-salary group had statistically significantly higher

scores for self-efficacy and collegial support than those in the low or medium-salary groups. Moreover, the salary was considerably associated with NPs' self-efficacy, with higher wages being linked to more challenging workloads and a greater sense of role responsibility. This study underscored the importance of perceived collegial support for hospital NPs, as it can lead to higher levels of personal achievement and reduced stress and burnout (Hu et al., 2018).

The limited number of NP studies conducted in East Asia, Southeast Asia, and Canada have also confirmed the value of collegial support on NP decision-making in practice, even though practice authority is not equivalent to the unrestricted practice of NPs in NZ. For example, in Australia, NPs, having been established for 20 years as NPs in NZ and primarily employed in acute care areas of public hospitals, have not successfully established a full independent scope of practice in PHC (Currie et al., 2022). This was primarily due to restricted government access to the national health insurance scheme benefits and the opposition from the AMA. The Australian College of Nurse Practitioners (2023) argued that the NP community/PHC practice model was not sustainable and was not meeting the population's needs.

Despite the NP practice challenges globally, collegial support and autonomous practice demonstrate an evolution of the nursing profession. Nurse Practitioners have enabled professional progression and clinical career pathways for nurses through autonomous practice. Historically, nurses have perceived supervisory support as the most crucial factor in their decision latitude. However, the present research demonstrated that the perceived collegial support, not supervisory support, influenced decision-making for NPs. This finding contributes to the global JDCS nursing research evidence and can be further explored in future studies about NP practice.

Validation of JCQ in a Population of Nurse Practitioners in New Zealand

This study's interest was to establish the construct validity of the JCQ in a population of NPs in New Zealand. The Job Content Questionnaire, as defined by Karasek (1979), explores psychosocial work environments. It also measures job strain, combining high *psychological job demands* and low *decision latitude*. *Social support* (from supervisors and colleagues) is the dimension that may buffer the effect of high job strain and stress-related illness (Johnson & Hall, 1988). Over the past 30 years, research on the JDCS has predominantly focused on the relationships between job demands (*psychological job demands),* job control (*decision latitude*), and job support (support from supervisors and colleagues) (Portoghese et al., 2020).

The dimensional structure of the JCQ was primarily explored and described using exploratory factor analysis (EFA) to identify which items relate to each factor (e.g., *psychological job demands*, *social support*, and *decision latitude*). Subsequent studies have employed CFA to validate whether their sample of observations fits the identified JCQ model

and suggest possible modifications to the theoretical model for future studies (Amin et al., 2015; Araujo & Karasek, 2008; Cheng et al., 2000; Eum et al., 2007; Sasaki et al., 2020).

In the current study of NPs in NZ, various techniques were employed, including assessing the psychometric properties using scale reliability (coefficient α) and examining the inter-correlations to identify any significant associations between the sub-scales. Lastly, construct validity was assessed through CFA to establish any similarity of factor structures between the studied population in NZ and the theoretical JCQ model.

Since the early 2000s, several JCQ studies that applied the CFA technique have supported the original constructs and, at times, proposed structural changes to the instrument. For instance, based on the GAZEL cohort, which focused on French working men and women, was conducted by Niedhammer (2002). This study confirmed a six-factor model, which included *psychological job demands*, *skill discretion*, *decision authority*, *supervisor support*, *co-worker support*, and *physical demands*. However, the study also recommended the revision of the two scales of *decision latitude* and *psychological job demands* due to low standardised factor loadings on items "repetitive work", "learn new things", "conflicting demands", "wait on others", and "no excessive work". Similarly, a Belstress study of employees in large companies across Belgium (Pelfrene et al., 2001) also confirmed a four-factor structure, which included *psychological job demands*, *decision latitude*, *supervisor support*, and *co-worker support*. Like the GAZEL cohort study, the Belstress study recommended revising the scales and items to enhance the instrument's accuracy.

Further research on the JCQ has revealed interesting findings. For instance, a study of Swedish workers (SLOSH) established a four-factor structure in a longitudinal study of Swedish workers (SLOSH), including *psychological job demands*, *skill discretion*, *decision authority*, and *social support*. The best-fit model was obtained when the "repetitive work" item was removed from the *skill discretion* factor (Chungkham et al., 2013). Similarly, a study of Polish workers conducted by Zolnierczyk-Zreda and Bedynska (2014) across various occupations confirmed a four-factor model comprising *psychological job demands* and *job insecurity*-combined into one factor: *decision latitude*, *supervisor support*, and *co-worker support*. Notably, the item "repetitive work" on the *decision latitude* scale exhibited the lowest factor loading. The study provided unique insights, highlighting *job insecurity* as a significant source of stress for Polish workers and an essential aspect of *psychological job demands*.

In Australia, a study by Merrick et al. (2012) focused on practice nurses. It was the first to validate a four-factor model describing relationships between *decision latitude*, *created skill*, *social support* (combining *supervisor* and *co-worker support*), and *self-identity through work scales*. Similarly, in line with earlier JCQ studies, the "repetitive work" item also showed the lowest factor loading in the *decision latitude* construct.

In the current study of NPs in NZ, three JCQ models were tested, with the five-factor model (with *decision latitude*, *psychological job demands*, *co-worker support*, *supervisor*

support, and *job insecurity* as factors) emerging as the best fit for the studied population. The goodness-of-fit indices supported this conclusion. This five-factor model shares the most similarity with the four-factor model observed in the Belstress study of workers in Belgium (Pelfrene et al., 2001), except for *job insecurity*. As there are no prior JCQ studies of nurses in NZ, the closest JDCS study with a similar sample size is a study of practice nurses in Australia (Merrick et al., 2012). The four-factor model identified in the Australian study included *decision latitude, created skill, social support*, and *self-identity through work.* Thus, some comparisons can be drawn between the two populations. Specifically, the factor loadings for the three items on the *decision latitude* scale (in *decision authority*) were higher in the NP population than in practice nurses. These items, such as "decisions on my own", "little freedom to decide", and "a lot of say", suggest that NPs perceived themselves to have authority to make decisions about their practice. On the other hand, the factor loadings for the *co-worker* and *supervisor support* confirmed that these items were appropriate measures of the *social support* construct in both populations.

The five-factor model derived from this study, comprising *decision latitude, psychological job demands, co-worker support, supervisor support,* and *job insecurity* as factors, demonstrated the best fit for the NPs in NZ. According to the theoretical JCQ model, the *social support* scale consists of a combination of *co-worker support* and *supervisory support*. However, the current research identified that *co-worker* and *supervisory support* should be considered as two separate scales. The study speculated that this separation might be because *collegial support* and *supervisory support* are two distinct constructs within the present study's sample. *Supervisory support* did not seem to play a significant role in the results, suggesting that the lack of a relationship between perceived *supervisory support* and freedom to make choices for NPs might result from practice autonomy. In the context of NZ, NPs do not have managers who supervise them, which could explain the diminished importance of supervisory support in their decision-making (i.e., in the context of NZ, NPs do not have managers who supervise them). The progression of advanced nursing practice may also be a contributing factor, where only *collegial support* is perceived as important for NPs to have the freedom to make decisions.

This research confirmed that the constructs measured by JCQ exhibit construct validity in a population of NPs in NZ. The results indicated that NPs' decision-making is influenced by the perceived support they receive from colleagues. Additionally, *supervisory support* was not significant or perceived as important for NPs. This might suggest that NPs have a sense of professional equality, perceiving physicians and other health professionals as their colleagues.

Implications for Global Policy and Practice

The findings of this study indicated that collegial support is the most crucial determinant of the freedom that NPs have in making decisions about the means and methods of performing their role, therefore enhancing practice autonomy. These findings align with the

International Council of Nurses (2022a) (ICN) recommendations that nursing policy consideration should include nurses working to their full scope of practice and supporting the development of advanced practice roles. This, in turn, will improve organisational performance, patient care, and nurses' satisfaction and well-being.

The global nursing workforce policies have a crucial role in shaping the future of healthcare. Building upon the ICN's recommendations, these policies can effectively promote collaboration between NPs and other healthcare professionals, including doctors and nurses. By fostering collaboration, NPs can enhance their decision-making abilities, leading to improved outcomes for healthcare consumers. One practical approach to strengthen collaboration is by integrating NPs into interdisciplinary teams. This integration allows NPs to benefit from collegial support networks, enabling them to learn from and consult with their peers. By working alongside professionals from various disciplines, NPs can broaden their knowledge base and gain valuable insights that contribute to their effectiveness as healthcare providers.

To further empower NPs, developing policies that recognise their expertise and provide opportunities to practice to the full extent of their education and training is essential. Nurse Practitioners possess specialised knowledge and skills that can significantly contribute to patient care. By removing barriers that limit their scope of practice, policies can enable NPs to deliver comprehensive and high-quality care, maximising their capabilities.

Continued professional development and training opportunities are crucial for NPs to stay current with the latest advancements in healthcare. Therefore, policies should prioritise implementing ongoing education programs that allow NPs to enhance their skills and expand their knowledge base. By investing in their professional development, NPs can improve their ability to make informed and effective decisions, ultimately benefiting the population they care for.

Advocating for equitable reimbursement for NPs, the ICN can ensure that these highly skilled healthcare providers receive appropriate compensation for their services. Addressing reimbursement disparities can incentivise NPs to continue delivering high-quality care. Fair and reasonable reimbursement policies also help attract and retain NPs, thus bolstering the nursing workforce and improving access to quality healthcare for consumers. Furthermore, the ICN should encourage and support research on the role of NPs in patient care. This research can focus on understanding the impact of NPs on patient outcomes and identifying the factors that influence their decision-making processes. By generating evidence-based knowledge, the ICN can contribute to advancing NP practice globally and further demonstrate the value and effectiveness of their contributions to healthcare.

In summary, expanding global nursing workforce policies based on the ICN's recommendations can promote collaboration, recognise the expertise of NPs, provide ongoing education and training, advocate for equitable reimbursement, and support research on the role

of NPs. These measures will enhance the capabilities and professional growth of NPs and contribute to improved healthcare outcomes for consumers worldwide.

Implications for New Zealand's Policy and Practice

The findings of this study can substantively inform future workforce planning in NZ. In 2019, the Health and Disability System Review (HDSR) highlighted the lack of structured planning had been a significant flaw in the current health system. The review recommended changes for the future workforce, emphasising the need to embrace interprofessional practice and enhance cultural diversity. Key recommendations outlined in the HDSR final report included the development of the health workforce through targeted initiatives and implementing new models of care with active community engagement. These recommendations are crucial for addressing the identified challenges and improving the effectiveness of the health system (Health and Disability System Review, 2020).

This study's findings revealed that NPs strongly value collegial support, which is pivotal in their decision-making. This finding holds significant importance as it suggests that achieving practice autonomy for NPs is attainable. Once practice autonomy is achieved, it can foster collaborative practice, leading to increased job satisfaction and better retention of the NP workforce. Consequently, this can potentially improve healthcare outcomes and enhance access to healthcare services for New Zealanders.

The findings from this research will inform the professional body, NPNZ, by enabling them to strengthen collaboration and advocacy efforts with national policymakers, the Manatū Hauora, and other professional groups such as the RNZCGP. The NPNZ can utilise these findings to enhance their advocacy for NPs and to improve recognition, visibility, and understanding of the NP role among other healthcare professionals and consumers. By leveraging this research, the NPNZ can play a vital role in promoting the advancement of NPs and facilitating positive change within the healthcare system. Furthermore, this study provides valuable recommendations for the national workforce policy, NP practice, and role promotion. In addition, a funded vocational training programme for novice NPs is proposed.

Workforce Policy

The health system reforms were initiated in 2022, and an interim *Government Policy Statement on Health* (iGPS) for 2022-2024 was introduced (Ministry of Health, 2022c). Objective 4.2 of the iGPS emphasised the need for the future health workforce to align with the specific needs of the NZ population. Furthermore, it highlighted the importance of empowering the current workforce to operate at the highest level within their scope of practice through innovative training and work methods. The research findings from this study hold significant relevance to these workforce objectives outlined in the iGPS.

This study found that collegial support in the NP practice environment is positively associated with decision-making abilities, autonomy, job satisfaction, and retention. This

association is crucial as it enhances the overall effectiveness and satisfaction of NPs with their practice environment. Therefore, by promoting NP-led practices or units that foster a collaborative approach among NPs, nurses, doctors, and allied health professionals, greater practice autonomy can be achieved, aligning with the objectives of the iGPS. This collaborative approach can contribute to a more efficient and patient-centred healthcare system in NZ.

The findings from the present doctoral study sample of NPs in NZ offer valuable insights to inform the new national *Health Workforce Strategy* under development in 2023. In the MoH (2022e) summary of health workforce engagement, several key themes were identified, including significant health workforce shortages, risks to the well-being of health professionals, and maldistribution of healthcare providers, particularly in rural settings. The summary also highlighted opportunities to address these challenges, such as supporting career pathways through enhanced supervision and mentorship, enabling professionals to work at the highest level within their scope of practice, and promoting collaboration among various health professions. Furthermore, policy suggestions included breaking down silos and implementing services where health professionals from different backgrounds work together and dedicate specific time to support and mentor. These policy suggestions addressed the identified workforce issues and sought to foster a more integrated and resilient healthcare system in NZ.

The revised *National Workforce Strategy* should prioritise developing and successfully integrating the NP workforce within the NZ healthcare system. It is essential for the workforce policy to clearly define the scope of practice for NPs, promoting understanding and recognition of their role. Integrating NPs into interdisciplinary teams is a key strategy to break down silos of health services and improve healthcare outcomes for the population. To support the growth of the NP workforce and enable them to practice to the fullest extent of their scope, fair funding allocation for education and training is crucial. Adequate funding is necessary to ensure access to resources, including the NPTP and continuing education programmes.

Moreover, research is essential to examine the impact of NPs on patient outcomes and the healthcare system. This research should focus on factors that influence NP integration and their role within the workforce. By exploring these areas, we can better understand the value of NPs and their contributions to the healthcare system, ultimately leading to improved patient care and outcomes.

NP-led Practice - PHC, Aged Residential Care, Community, and Rural Settings

The findings of this study support the concept of autonomous NP-led practice settings, such as PHC, community, rural, and aged residential care homes. In this study, NPs reported a higher decision latitude when supported by their professional colleagues. If, as the ICN (2022b) argued, NPs should be working to the “top of the scope, " an ideal supportive environment could be advocated for. This position has been supported by contemporary evidence from Canada, the Netherlands, Taiwan, and the United States.

For example, a study conducted by Amost and Laschinger (2005) in Canada, which involved 117 NPs, reported that working in settings such as PHC or residential aged care was more conducive to practice than working in public hospitals. In a smaller NP-led work environment, NPs achieved a fully autonomous and collaborative approach, allowing them to have control over their decision-making abilities. The study suggested that a greater engagement of NPs in PHC, at both the clinical governance and operational levels, would provide opportunities for NPs to develop collaborative health services. This study reinforces the importance of creating supportive environments for NPs to practice autonomously, particularly in PHC and aged residential care homes. Collaboration among NPs and their professional colleagues is crucial for maximising their decision-making capabilities and delivering high-quality care.

Chavez et al. (2018) emphasised the importance of NP-led practice for older adults in a scoping review of international NP practice settings. The review included 56 primary research studies from four countries: Canada, the Netherlands, Taiwan, and the United States. All these countries have accredited master's level university NP programmes comparable to NZ. The results of the literature scoping review indicated that NPs demonstrated improved outcomes in service utilisation, cost, length of stay, health indices, satisfaction with service, and quality of life compared to the usual biomedical model of care. The benefits of NP-led care were found to be particularly significant in community and long-term care settings (Chavez et al., 2018), which aligns with the recommendations of the current study. Overall, this scoping review provides further evidence supporting the implementation of NP-led care for older adults. The findings highlight the positive impact of NPs on various outcome measures and underscore the importance of their role in community and long-term care settings. These results reinforce the need to consider the integration of NPs into healthcare systems to improve care quality and outcomes for older adults.

In addition to greater autonomy in NP-led practice settings, several other benefits include providing more personalised patient care by building strong relationships with healthcare consumers. NPs also experience improved flexibility with work arrangements, which enhances their work-life balance and opens opportunities for entrepreneurship. In NZ, NPs have the potential for management and practice ownership, leading to greater financial stability. Moreover, NP-led practices offer significant opportunities for professional growth, allowing NPs to assume leadership roles and take on increased responsibility. These practices can provide NPs with a more fulfilling and satisfying career. Overall, NP-led practice settings offer a range of advantages beyond autonomy. These include providing individualised care, achieving a better work-life balance, pursuing entrepreneurial opportunities, gaining financial stability through management and ownership, and experiencing professional growth and fulfilment.

This study found that when NPs have an increase in perceiving themselves as valued and appreciated, they experience less job insecurity. However, this relationship is specifically

relevant to the NPs practicing in rural or small urban areas in NZ. The rural PHC setting provides NPs with greater practice autonomy, particularly in isolated areas. NPs working in rural PHC settings can address the health workforce shortages in NZ and improve access to healthcare for isolated and marginalised communities. The scope of practice in primary healthcare has been a focal point for the NCNZ. Despite the removal of legislative barriers and the ability to establish independent PHC practices, growth in this area has been limited. As of January 2023, 56.4% of 656 NPs in NZ have a PHC scope of practice (Nursing Council of New Zealand, 2023).

Furthermore, only five NPs (1.4%) own and manage their PHC practices nationally. The provision of government funding and financial incentives for NPs to establish and sustain their PHC practices is currently limited. This study highlights the importance of NPs feeling valued and appreciated in their roles, particularly in rural and small urban areas of NZ. It emphasises the potential of NPs in rural PHC to address workforce shortages and enhance healthcare accessibility for marginalised communities. However, there are still challenges in promoting the growth of NP-led PHC practices, including limited financial support and incentives from the government.

Implementing a mentorship programme that facilitates collegial support, connecting experienced NPs with those interested in starting their practices, and providing educational opportunities in business management could address the current shortage of NP-led PHC practices in NZ. Additionally, researching the impact of NP-led PHC practices on patient outcomes, including factors that influence their sustainability and success, is crucial for advancing the role of NPs in PHC. Promoting the NP role at a national level is essential, as this can improve healthcare consumers' understanding and willingness to seek care from NPs, ultimately enhancing access to health services. Overall, implementing a mentorship programme, combined with education in business management, would help address the shortage of NP-led PHC practices in NZ. Additionally, researching the impact and sustainability of NP-led PHC practices and promoting NP roles nationally can contribute to improving access to healthcare and advancing the role of NPs.

National Nurse Practitioner Role Promotion

A national NP role promotion could improve the lack of understanding of the NP role by health professionals and healthcare consumers, as identified in the study's literature review. In 2021, Officer et al. (2021) argued that the NP role needs to be well-demarcated, defined, and integrated within the health service to strengthen collaborative practice. The education of healthcare consumers about the specific roles of the team, in turn, enabled the consumers to make an informed choice about NP services. The service delivery should be centred around the needs of the person rather than the healthcare providers. The person-centred model improves health outcomes by focusing on the unique needs and preferences of the healthcare consumer.

The care provided is more effective and personalised, involving the person in decision-making and enhancing empowerment. As a result, improved satisfaction with care was achieved, and increased adherence to the treatment plans. The person-centred model of care fosters trust between the healthcare provider and the person, leading to improved communication and collaboration and improved health outcomes. A person's autonomy is recognised and respected, allowing for informed decisions about their care. The overall healthcare consumer's experience is improved, leading to better outcomes and improved quality of life. Therefore, centring service delivery around the needs of the person rather than the healthcare provider is crucial for providing high-quality, effective, and PCC. This research supports the PCC model of care and NP collaborative practice.

Public promotion by the NCNZ and the College of Nurses Aotearoa could address the lack of understanding of the NP role. Public education and awareness about the role of NPs could be achieved through media campaigns, community events, and educational materials. The promotional materials need to include the qualifications and expertise of NPs and can be disseminated through professional organisations and advocacy groups. Opportunities can be provided for healthcare consumers to learn about NPs and their services through community health fairs, health clinics, public events, and social media.

An example of a successful global social media initiative about the role of a GP was initiated by the World Organisation of Family Doctors (WONCA) through Twitter (a social media platform) in 2015 (Hoedebecke et al., 2016). General Practitioners were asked to respond in one word about their favourite part of family medicine/general practice. Responses were used to create an image representing each country, with over 80 images made in 60 countries. The images were viewed more than 6,000 times across 95 countries. The initiative was embraced in NZ, and a pictogram was uploaded on the website and viewed in 10 countries worldwide. As pictures are more straightforward than words, the images successfully represented the GP's values, passion for their profession, and the union between the GP and the community. The global initiative was used to promote the role of GPs in NZ and to improve society's understanding of the role in the health system and the values underpinning the role (Hoedebecke et al., 2016).

The International Council of Nurses can undertake similar social media-based initiatives to promote the NP role or a national campaign in NZ by the College of Nurses Aotearoa in collaboration with the NCNZ and the Manatū Hauora. A national marketing campaign can provide case studies and success stories that highlight the positive impact of NPs on patient outcomes and promote the dissemination of NP role research findings to the public. The improved understanding of the NP role may encourage healthcare providers to refer patients to NPs when appropriate to increase access to high-quality and specialised care. Overall, promoting the NP role to healthcare consumers can increase access to high-quality care and improve outcomes for the community.

Collegial Support Through a Funded NP Vocational Training Programme

This study found that NPs perceive themselves as having more freedom to make decisions about their practice when supported by their colleagues, and the application of these findings is a proposed funded NP vocational training programme during the first year of practice. Currently, in NZ, only vocational training programmes are offered to medical graduates in general and rural practice. Government funding for NPs is limited to the NPTP and has received a limited number (20 per year) of funded placements for NP trainees since 2016. The number of funded NPTP placements increased to 50 per year in 2021, which is considered less than two-thirds of the placements required to meet workforce demand, and the NPTP is not accessible to all NP candidates (Adams, Oster, et al., 2022). Collegial support and mentorship of NP trainees are required in their NPTP placements and clinical practice to achieve 500 hours of supervised clinical time with an accredited NP. Neither collegial nor professional support is funded or provided to novice NPs in NZ. Support and funding need to be extended through new NPs' first year of practice, like that of medical graduates, allowing new NPs to be provided with ongoing professional peers (collegial support) and education.

An example of a well-established vocational training programme for medical graduates in general practice in NZ was implemented in 1995 through the Royal NZ College of General Practitioners (RNZCGP), which sets the professional standards, runs the vocational training programme, and reports to the Medical Council of NZ (MCNZ). The General Practice Education Programme (GPEP) pathway takes three years to complete, with four days per week of clinical practice and one day for other education. The programme includes one-on-one supervision with a senior GP, peer review of complex cases, seminars, workshops, online learning, and patient feedback. There have been opportunities to undertake postgraduate papers in a clinical area of interest in the last two years. Upon completing the GPEP, the RNZCGP awards a fellowship (Goodyear-Smith et al., 2020).

Another example of a vocational training programme called the Rural Hospital Medicine Training Programme (RHMTP) was commenced in NZ in 2008 for the rural hospital medical workforce. The programme originated because of significant rural hospital workforce shortages and a lack of a training pathway specific to rural hospital medicine by MCNZ. The programme originated because of significant rural hospital workforce shortages and a lack of training pathways specific to rural hospital medicine (RHM) offered by the MCNZ. The Rural Hospital Medicine Training Programme is subsidised by Health Workforce New Zealand (HWNZ) through the hospital specialties in the DHBs (public hospitals). The scope of the RHMTP is defined by the rural environment, which includes geographical isolation and is orientated to secondary care, in contrast to GP vocational training (Blattner et al., 2021).

The Rural Hospital Medicine Training Programme includes recognising prior learning (clinical and academic), competence-based assessment and a modular pathway. The four-year programme offers distance learning and flexibility in both rural and urban locations. It is

provided by the University of Otago's Postgraduate Rural Programme; graduates obtain a Postgraduate Diploma in Rural and Provincial Hospital Practice upon completion. The papers are distance-taught and face-to-face residential workshops held on a local marae (Māori meeting grounds) for 4–6 days, providing a powerful learning experience. Topics covered are rural health inequities, living and working in rural communities, palliative care, and mental health. The trauma and emergency paper is taught as a high-fidelity simulation in Christchurch Hospital. The learning is provided in a small group and in a case-based environment, emphasising the rural context (Nixon et al., 2017). A ten-year review of the vocational RHMTP by Blattner et al. (2021) identified barriers relating to the alignment of training requirements and access to funding. It acknowledged the critical role of nurses in rural hospitals and communities and recommended the support of health professionals in developing rural-specific training and education.

The first year of practice for health professionals in a clinical environment has been identified as stressful and requiring support from senior and experienced practitioners. A study of junior doctors in NZ in their first year of practice by Sheehan et al. (2012) identified three themes: (1) concrete tasks, (2) project management, and (3) identity formation. Concrete tasks were the technical skills and efficient performance of tasks and clinical procedures. Project management included case management, teamwork, liaison, managing difficult communications, and efficiency with paperwork. Identity formation comprises role development, teamwork, relationships with other health professionals, self-management such as dealing with emotional situations, and learning from and within the workplace. In the early years of practice learners were required to reflect on their practice and the practice of others. Nurse Practitioners experience similar challenges. Transitioning from expert RNs to novice and less experienced NPs is a challenging paradigm shift. The journey generated anxiety, insecurity, and feelings of stress, leading to role confusion and a decline in role identity, leading to a prolonged period of adjustment (Heitz et al., 2004; Thompson, 2019). The role transition was multifactorial and a combination of intrinsic and extrinsic forces. Intrinsic forces were coping mechanisms and stressors from dealing with competing priorities. External forces were a complex combination of work environment culture, collegial support (especially role modelling), collaboration and networking, and organised orientation programmes (Heitz et al., 2004).

The role transition for novice NPs into the first year of practice has been extensively studied in the United States since the early 2000s, following seminal work by Flinter (2011), who outlined a newly funded model of a one-year residency for NPs working in PHC in 2007. After years of observing first-year NPs, Margaret Flinter identified the problematic transition from academia to clinical practice and proposed an NP residency programme. The model included comprehensive orientations, assigned preceptors, and a gradual increase in assuming responsibilities. The preceptors were a team of experienced NPs, doctors, and medical

specialists assigned to mentor only the novice NP, and the preceptors did not see patients during the clinic. This included specialty clinical skills, documentation, prescribing practice, and discussion of complex presentations. Preceptors reported a high level of job satisfaction due to decreased stress and rewards from teaching (Norwick, 2016).

Consequently, many funded NP residency or fellowship programmes have been developed in the United States in the last 20 years and are usually one year in duration. Most research about NP residency programmes was based on Benner's (1984) "novice to expert" framework for understanding the NP role transition into the complex clinical practice. The five proficiency levels were described as novice, advanced beginner, competent, proficient, and expert (Benner, 1984). In the first year of practice, the novice NPs perceived themselves as having improved confidence and competence. During the NP transition to advanced beginner, additional support was required to integrate into a new clinical practice environment, progress in learning, and gain a deeper understanding. Progression to proficiency levels and then expert occurred over years of working and practicing as a holistic professional practitioner (Brown & Olshansky, 1997). According to Godfrey and Young (2020), as nurses change practice areas, they alter their professional identity. "Acting ethically" was a vital component of professional identity formation. The progression from RN to NP was considered a professional identity change because both roles share similar ethics, norms, and values but have different scopes of practice, roles, and responsibilities (Owens, 2018).

Some successful NP residency programmes in the United States include PHC clinics, retail health clinics, and rural and community psychiatry fellowships. The feedback was that the NP residency programmes could provide adequate clinical, business, and preceptor support that was required for a successful transition and improved retention of NPs (Frissora & Ranz, 2021; MacKay et al., 2018). A recent study of NP transition to practice by Cappiello and Boardman (2022) outlined that collegial support from other NPs was the key to early success, supporting the development of clinical expertise. This improved self-confidence and autonomy, supporting the role transition and job satisfaction.

Several studies in the US focused on the outcomes of the established NP residency programmes. The effects of completing a residency programme on PHC NPs' transition to practice were examined by Park et al. (2021), comparing outcomes of NPs with residency training to those without in a nationally representative sample of NPs. The study distinguished that graduate residency programme NPs had an increased mastery of the independent PHC provider role and increased confidence in practice. Employers perceived confidence and mastery of independent clinicians as crucial to productivity. Further benefits of this group included improved team collaboration, which improved the quality of care for the patients. The positive outcomes of the residency programme included enhanced recruitment and retention of new graduate NPs in PHC practice settings. Hart et al. (2022) examined the sustained career impact of the residency programme on 65 NPs in a Community Health Centre after 11 years of

practice. The findings demonstrated a long-lasting effect of the residency programme on the commitment to continue practice in PHC. The high level of NP competence, confidence, and clinical mastery developed during the programme was transformative; the clinical and leadership skills were transferable to any health organisation.

Due to the increasing numbers of NPs in the US and the interest in supporting new NPs' transition to practice in a complex healthcare system, a Novice NP Role Transition (NNPRT) Scale was developed by Barnes et al. (2021). The first NNPRT Scale contained 40 items that measure the NP's perception of their experience of role transition and examine the interventions to prepare and support novice NPs. An exploratory factor analysis confirmed a five-factor structure: (1) organisational alignment, (2) mentorship, (3) a sense of purpose, (4) perceived competence and self-confidence, and (5) compensation. The organisational alignment factor related to professional autonomy, quality of relationships, feeling respected by others, and how well the NP felt welcome and integrated into the practice. The mentorship factor measured the quality of the mentorship their colleagues may provide within or outside the practice. A sense of purpose measured the purpose and meaning at work by helping patients and making a difference in their community, which were positive factors for NPs. Perceived competence and professional autonomy were the NP's feelings about their ability to meet the role demands, patients' needs, and the feeling of being productive in their job. The final factor related to satisfaction with their financial compensation, specifically fair pay parity with their peers rather than high salaries.

Further study to confirm the internal factor structure of the NNPRT Scale was conducted by Barnes et al. (2023) through CFA. The analysis confirmed the five-factor structure, including 37 items, and the internal consistency reliability was calculated at .95. The findings demonstrated convergent and divergent validity by establishing the relationships between receiving a formal orientation and turnover intention. A lack of association was found with years of prior experience as an RN. In the interest of studying the clinician's well-being, the NNPRT Scale was reported to be a valuable and valid instrument for supporting the successful development of novice NPs.

The results from the current study of NPs in NZ provide a new understanding that perceived collegial support improved freedom to make decisions in practice and consequently may enhance practice autonomy. Nurse Practitioners responded to collegial support and worked collaboratively with other health professionals. To support the role transition of a novice NP, the study recommends a funded residency or vocational training model for the first year of NP practice to enhance collegial support and practice autonomy. Considering the significant research from the US about NP residency programmes and the existing well-established GP vocational training model for junior doctors in NZ, a similarly funded vocational programme for NPs is proposed.

A vocational training programme for novice NPs in NZ can include the following components: (1) theory-based learning, such as courses and webinars to maintain professional competence and currency in advances in healthcare, (2) clinical experience in their area of practice, (3) mentorship and support from experienced NPs during their clinical practice with a focus on PCC, (4) interdisciplinary learning, encouraging collaboration and learning from other health professionals, (5) assessment and evaluation, including regular monitoring of the progress of novice NPs and providing feedback for improvement, and (6) certification/fellowship on completion of the vocational training programme. The evaluation of the vocational training programme can be completed with the validated NNPRT Scale.

The vocational training programme for novice NPs can increase their knowledge, skills, and collegial support to become safe, effective, and competent NPs. Consequently, promoting the integration of NPs into the healthcare system in NZ and accomplishing the *NZ Health Strategy*'s objectives of improving access for the population, especially in rural and marginalised communities.

Study Strengths and Limitations

The strengths of this study include the fact that it is the first rigorous statistical analysis in NZ to validate both JCQ reliability and construct validity in a population of NZ NPs. The analysis included the assessment of the psychometric properties using scale reliability (coefficient α); then, inter-correlations were used to identify significant associations between the constructs. Construct validity was demonstrated through CFA, and the similarity of factor structures to the theoretical JCQ model in the population of NPs was established.

The study tested three CFA models, and the five-factor model (with *decision latitude, psychological job demands, co-worker support, supervisor support, and job insecurity* as factors) was the best fit for the studied population. Linear regression analyses, including moderation and mediation, established the strength of the relationships between the JCQ constructs within a unique geographical context.

While this study has provided valuable contributions, it is essential to acknowledge that no research is without limitations. The first limitation is that the sample size was slightly low for CFA. Although the data fitted the model well, to confirm construct validity in the population of NZ NPs, the theoretical model (i.e., the JCQ) should have been tested with a larger sample because the expected number of cases for each variable was 10 cases per 25 variables; therefore, the ideal sample size for CFA should have been at least 300 participants. The sample size was sufficient for linear regression analysis but not optimal for CFA. Furthermore, the sample size of the metropolitan versus rural groups was a limitation as there were 116 participants in the metropolitan group and only 36 in the rural group. An independent samples *t*-test for this analysis assumed that the groups being compared had equal variances. When the groups being compared have different sizes, this can affect the variance of the group means, affecting the *t*-statistics of the *t*-test (Field, 2018).

Therefore, a difference in group means may appear significant when it is not because of the difference in group sizes. Increasing the sample size of each group (metropolitan and rural) can improve credibility and accuracy, as can a comparison between practice settings and geographical locations. The current study could not establish the role of psychological job demands, which can be another limitation. Perhaps using a larger sample size or adjusting some of the scale's items better to fit NPs' job descriptions and working contexts might have helped establish the true influence of *psychological job demands* on NPs in NZ.

Although *social support*, and, in particular, *collegial support,* played an important role in NPs' freedom to make decisions, the present study also assumed that *psychological job demands* might play a role, especially as previous studies have shown the importance of *psychological job demands* (Baba et al., 2013; Bagheri et al., 2021; Bakker et al., 2008; Zeike et al., 2018). *Psychological job demands* demonstrated internal reliability, yet the present study could not confirm the influence of psychological demands because it did not significantly correlate with other scales. Weak correlations between *decision latitude* and *psychological job demands* were reported in earlier longitudinal studies, the French GAZEL cohort study (Niedhammer, 2002) and the Belstress study in Belgium (Pelfrene et al., 2001). Both studies were longitudinal, with large sample sizes of over 10,000 participants and conducted in Europe across all occupations. Identified low correlations between *psychological job demands* and *decision latitude* indicated that both scales should be revised to grasp the increasing mental workload in global economies. The current study of NPs in NZ identified similar low correlations with a homogenous cohort of highly skilled and educated nursing professionals. This indicated that the *psychological job demands* items might not be measuring the underlying concept of the scale in the population of NPs and, therefore, a revision of the item "I am free from conflicting demands" is recommended for future research. The reliability of the *psychological job demands* scale was reported as low to moderate in many nursing studies, suggesting that the five questions underpinning this scale may not be sufficient to describe the various *psychological job demands* experienced by nurses (Niedhammer et al., 2020; Roelen et al., 2014; Sasaki et al., 2020).

According to Santos et al. (2017), the structure of *psychological job demands* items "I am free from conflicting demands" and " No excessive work" should be reviewed as some jobs do not have a fixed routine but require a high level of skill and creativity. As Nurse Practitioners are highly skilled, and their work structure is not routine or repetitive, as Bonner et al. (2020) outlined, this could explain the lack of any relationship between *psychological job demands* and *decision latitude* in the current study.

No significant linear association was identified between *psychological job demands* and *decision latitude*; therefore, *psychological job demands* did not explain any variation in *decision latitude*. Internal consistency within *psychological job demands* was acceptable. Hence, the lack of any relationship with *decision latitude* in the current study might have resulted from JCQ

items being worded inappropriately for nurses. Some items may not have been relevant to their experiences and/or specific nursing tasks, leading to difficulty in accurately assessing job demands. Clearly, *psychological job demands* did not play a role in the current study, yet this result might have been purely by chance and not a consequence of inappropriate items that measured the scale. A follow-up study using a larger sample of NPs might identify the effect of *psychological job demands* on *decision latitude.*

Another limitation of the current study is that the JDCS model was based on self-reported measures and, therefore, could have been influenced by biases. Respondent bias can threaten the internal validity of responses in self-reporting data collection, according to Polit and Hungler (1999), as some respondents may distort their responses to present a favourable image of themselves. Social desirability bias can occur with participants who tend to respond in a way they deem more socially acceptable. To reduce or eliminate such respondent bias, the questionnaire was structured without vague judgements, providing an opportunity for objective feedback. The questionnaire was constructed as a minimalist word design to prevent confusion among the participants, e.g., embedded clauses and ambiguous words were avoided. Despite the abovementioned concerns, the questionnaire constructs demonstrated acceptable internal validity, and the reliability analysis was consistent with previously published JCQ research (Amin et al., 2015; Eum et al., 2007; Merrick et al., 2012; Niedhammer et al., 2020; Santos et al., 2017; Sasaki et al., 2020).

Future Research

This research has demonstrated that NPs in NZ perceive themselves to have more influence over their clinical decision-making when supported by their colleagues. This is a novel finding in the context of the JDCS model. The "role control and support" theory seeks to understand how work characteristics relate to employee well-being, health, and performance (Häusser et al., 2010; Karasek, 1979). The current study was conducted in September 2020, in the first six months of two years of the global COVID-19 pandemic. In New Zealand, the spread of the COVID-19 virus was controlled in 2020 due to the highest levels of lockdown worldwide, which created additional pressures on the health workforce, especially nurses. The pandemic continued into 2021, with the virus spreading to the community despite strict lockdowns (Holroyd et al., 2022). Global pandemic-related research has identified the necessity to assess and acknowledge nurses' work strain due to direct contact with patients and exposure to infections (Hochwarter et al., 2022). Future research is recommended to explore the impact of COVID-19 fatigue on NPs, including its effects on job satisfaction, mental health, and patient care outcomes.

The current study's findings showed that not only does support provided by colleagues positively influence the freedom to make decisions at work, but this relationship, in turn, influences the support and relationships that NPs perceive themselves as having with patients.

The research conducted by van Diepen et al. (2022) (van Diepen et al., 2020) demonstrated that NPs excel in providing collaborative PCC care by integrating ethical principles and specialised expertise into their practice, fostering strong patient relationships. Further exploration through the JDCS model of the NP work environment, the impact of the PCC model of care and its effect on NPs' decision latitude is recommended. This approach can show how implementing the PCC model impacts NPs' ability to make independent decisions and exercise professional judgment. Additionally, future studies should investigate how PCC principles in NP practice contribute to improved patient health outcomes. Carryer and Adams (2017) have illustrated the potential benefits of PCC, including enhanced patient satisfaction, increased engagement in self-care, and improved overall health outcomes. These outcomes can be compared to those achieved through traditional biomedical models of care to provide a comprehensive evaluation of PCC effectiveness.

Another vital area of investigation is assessing the role of communication and shared decision-making in patient health outcomes. Understanding how NPs' application of PCC principles influences patient autonomy and adherence to treatment plans can provide valuable insights into the impact of patient-provider collaboration on healthcare outcomes. Furthermore, exploring the factors contributing to patient satisfaction and trust in the NP-patient relationship is essential. Emotional support, respect for cultural diversity, and understanding of social determinants of health have been identified as crucial factors fostering positive patient experiences. McLachlan et al. (2015) have verified these findings through their research conducted in a novel NP-led cardiology clinic in South Auckland. Future research could expand upon the current study's findings by investigating the impact of the PCC model on NP decision latitude through the JDCS model. Additionally, studies should focus on assessing the effects of PCC principles on patient health outcomes, measuring patient satisfaction, evaluating patient engagement in self-care, and comparing PCC to traditional biomedical models of care. Moreover, exploring the role of communication, shared decision-making, and the factors contributing to patient satisfaction and trust in the NP-patient relationship will provide valuable insights for improving healthcare delivery.

Future research could consider assessing the potential impact of PCC in NP practice on health outcomes and costs; to analyse how PCC approaches influence resource utilisation, patient satisfaction, and overall healthcare system efficiency would offer valuable lessons. There is a lack of evidence about the global outcomes of cost-benefit analyses of NP practice, as outlined in a systematic review by Jennings et al. (2015), which identified 1,013 international studies about the role of an emergency NP. While Jennings et al. highlighted that quality of care was poorly defined, the authors nonetheless concluded that NPs could positively impact the quality of care, patient satisfaction, waiting times, and improved patient access (Jennings et al., 2015).

The present study recommended a funded vocational training model for the first year of NP practice to enhance collegial support and practice autonomy. Future research is recommended to examine the impact of PCC principles in NP education and training programmes, such as the vocational training programme for novice NPs. Assessment of how well new NPs are prepared to provide PCC and more research to identify training gaps and explore strategies for improving education in this area are all possible avenues for future research.

The results of the current study also indicated that with an increase in self-identity through work, NPs felt less insecure in their jobs, and this relationship was conditional on the NPs practicing in rural/small urban areas in NZ. Further studies can explore the impact of NP-led practice on the health outcomes of rural, remote, and marginalised communities. While limited NZ studies suggest that NPs can improve access to care and health outcomes in these areas (Adams & Carryer, 2019; Carryer et al., 2011), more research is needed to determine the extent to which these benefits have been realised and to identify the specific factors that contribute to their success. Additionally, future studies should explore potential challenges to NP practice and examine strategies to overcome these challenges to improve healthcare delivery in these areas. These recommendations provide a starting point for future research. Further exploration is also needed to understand the integration of NP practice with PCC and its impact on patient relationships.

Conclusions

This original Job Demand-Control-Support study conducted in New Zealand has yielded profound and invaluable findings that shed light on the crucial role of collegial support in shaping the decision-making abilities of NPs about their practice. The significance of autonomy in their profession cannot be overstated, as it empowers NPs to exercise their expertise, practicing independently and unleashing the full potential of their advanced education and clinical training. The study's compelling results underscore the vital role of their perceived collegial support in enhancing NPs' freedom to make informed and impactful decisions about their practice and professional autonomy.

Moreover, this research has unveiled a revelation specific to the NZ context- a supportive work environment is a powerful catalyst that enables NPs to exert greater control over their work and fosters meaningful patient relationships. This novel finding has the potential to effectively inform health service policies, leading to greater recognition and integration of NP practice in the healthcare system. By embracing NPs as invaluable pillars of the health workforce, NZ can enhance service delivery and align with the policy and equity objectives outlined in the *NZ Health Strategy* and health system reforms. To achieve this, health service workforce policy must prioritise the development and direction of the NP workforce, empowering NPs to thrive and flourish in their roles. Emphasising their inclusion in

interdisciplinary teams will be pivotal, facilitating the fulfilment of their mission to provide high-quality health outcomes and ensure equitable access to health services for the population.

Furthermore, the study has revealed a critical insight- NPs who perceive themselves as valued and appreciated experience enhanced job security. This profound relationship becomes even more pronounced for NPs practicing in rural areas of NZ. The rural primary health setting becomes an abundant ground for enhanced practice autonomy, particularly in isolated regions where NPs play a vital and transformative role in addressing the health workforce shortages and bridging the gap to deliver healthcare to isolated and marginalised communities. In this quest, robust government support and recognition of NPs as autonomous and competent healthcare professionals will be instrumental in dismantling healthcare disparities in NZ and ensuring every citizen receives equitable and comprehensive care.

To elevate NPs to greater heights and ensure their seamless integration into the healthcare landscape, implementing a vocational training programme for novice NPs becomes an essential step. This programme catalyses enhancing their knowledge, honing their skills, and fostering collegial support- transforming them into safe, effective, competent practitioners. By embracing this transformative approach, NZ is poised to cement NPs' integral role in the healthcare system, echoing the overarching objective of the *NZ Health Strategy*, particularly in augmenting access to healthcare for every single individual.

Nurse Practitioners in NZ must be acknowledged as indispensable agents of change in addressing the health workforce shortages, whether working as valued members of a collegial team in established practices or driving progress as autonomous, NP-led PHC service providers. The future of healthcare in NZ lies in unleashing the full potential of NPs as they lead the charge towards a healthier future for all New Zealanders.

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Glossary

Word/acronym	Meaning
Allied Health professionals	Health workforce made up of health professionals who are not part of the medical, dental, or nursing professions. There are at least 43 professions that are classed as Allied Health professions in NZ, such as Occupational Therapist, Physiotherapist, Podiatrist, Dietician and Pharmacist.
Cronbach's alpha (α)	Measure of internal reliability and how closely related a set of items are as a group.
Confirmatory Factor Analysis	Statistical technique used to verify the factor structure of a set of observed variables.
Construct validity	A degree to which a test accurately measures the concept it was designed to evaluate. It assesses whether the variables being tested for behave in a way that support the theory.
Decision latitude	Ability to make work-related decisions. The individual's potential control over tasks at work.
General Practitioner	Doctors vocationally registered in General Practice. Skilled in diagnosis, especially in early stage of a condition.
Health Practitioner	Defined under Health Practitioners Competence and Assurance Act 2003 as a person who is or is deemed to be registered with an authority as a practitioner of a particular health profession.
Healthcare professionals	Highly skilled workers in professions that require extensive knowledge including university-level study.
Interprofessional teams	Two or more health professionals that work collaboratively to improve patient and family experiences, ensure positive outcomes, and reduce costs for organisations.

Word/acronym	Meaning
Iwi	Largest social units in NZ Māori society, meaning "people", "nation" or "tribe".
Job strain	A form of psychological stress that occurs in the workplace. It occurs when a person experiences high job demands combined with low control or decision latitude at work.
Linear regression	Data analysis technique that attempts to model the relationship between two variables by fitting a linear equation to observed data.
Māori	Indigenous Polynesian population of NZ. Arrived in NZ over 1000 years ago.
Medical Practitioner	Health practitioner registered with the Medical Council of NZ as a practitioner of the profession of medicine.
Multi-disciplinary team	Group of health professionals working together to deliver person-centred and coordinated care and support for the patients.
Nurse Practitioner	Health practitioner registered with the NZ Nursing Council. A Registered Nurse with a clinically focussed master's degree, met NZNC assessment criteria and competencies and have four to five years' experience at an advanced level in a specific scope of practice.
Northland	Northern part of NZ, coextensive with the North Auckland Peninsula.
North Island	The smallest and northern-most of the two islands of NZ, separated from South Island by Cook Strait.
Pacific Peoples	Pan-ethnic group of New Zealanders associated with, and descended from, the indigenous peoples of Pacific Islands outside NZ.
Pākehā	A Māori term for a New Zealander of European decent ethnic group.

Word/acronym	Meaning
Person-centred care	Practice in which patients actively participate in their own treatment in close cooperation with their health professionals. Focusing care on the needs of the individual.
Registered Nurse	Health practitioner registered with NZ Nursing Council who have successfully completed a three-year Bachelor of Nursing degree.
Reliability analysis	Analysis procedure calculating a scale's reliability, providing information about the relationships between individual items and scales.
South Island	The larger and southernmost of the two islands of NZ in the southwestern Pacific Ocean.
Treaty of Waitangi/Tiriti o Waitangi	Accepted as a constitutional document that establishes and guides the relationship between the Crown in NZ (embodied by the government) and Māori. Signed in 1840.
Whānau	Extended family or community of related families who live together in the same area. In Māori culture it is the collective of people connected through a common ancestor.

Appendices

Appendix A-AUTEC Ethics Application Approval Letter

Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

31 July 2020

Eamon Merrick
Faculty of Health and Environmental Sciences

Dear Eamon

Re Ethics Application: **20/194 A cross-sectional study of Nurse Practitioner decision-making in a variety of practice environments in New Zealand.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 30 July 2023.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.

AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through http://www.aut.ac.nz/research/researchethics

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: nutrixconsulting@gmail.com; Stephen Neville

Appendix B-MMAT of Literature Review

				SCREENING QUESTIONS		1. QUALITATIVE STUDIES					4. QUANTITATIVE DESCRIPTIVE STUDIES					5. MIXED METHODS STUDIES					COMMENTS
RefID	First author	Year	Citation	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	1.1. Is the qualitative approach appropriate to answer the research question?	1.2. Are the qualitative data collection methods adequate to address the research question?	1.3. Are the findings adequately derived from the data?	1.4. Is the interpretation of results sufficiently substantiated by data?	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?	4.1. Is the sampling strategy relevant to address the research question?	4.2. Is the sample representative of the target population?	4.3. Are the measurements appropriate?	4.4. Is the risk of nonresponse bias low?	4.5. Is the statistical analysis appropriate to answer the research question?	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?	5.2. Are the different components of the study effectively integrated to answer the research question?	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	
1 NZ	Mackay, B.	2003	Mackay, B. (2003). General practitioners" perceptions of the Nurse Practitioner role: an exploratory study. The New Zealand Medical Journal, 116(1170), 1-8.	Yes	Yes						Yes	No	Yes	No	Yes						Non-response bias due to low response rate of 46.3%
2 NZ	Pirret, A.	2008	doi:10.1016/j.iccn.2008.04.007	Yes	Yes						Yes	Yes	Yes	Yes	Yes						Non-simultaneous bias due to comparison of historical data
3 NZ	Carryer, J.	2011	Carryer, J., Boddy, J., & Budge, C. (2011). Rural nurse to nurse practitioner: an ad hoc process. Journal of Primary Health Care, 3(1), 23-29.	Yes	Yes	Yes	Yes	Yes	Yes	Yes											
4 NZ	Gagan, M.J.	2014	doi:10.1002/2327-6924.12166	Yes	Yes											Yes	Yes	Yes	Yes	Yes	Response bias- emailed survey may have not reached the population
5 NZ	Pirret, A.	2015	doi:10.1016/j.ijnurstu.2014.08.009	Yes	Yes						Yes	No	Yes	Yes	Yes						Underpowered due to low numbers of doctor participants
6 NZ	Harvey, C.	2015	Harvey, C. (2015). Obstacles that prevent nurse practitioners in New Zealand fulfilling their roles. Primary Health Care Research & Development, 25(5), 24-29.	Yes	Yes											Yes	Yes	Yes	Yes	Yes	Non-response bias- low number of participants (35 out of 120)
7 NZ	Carryer, J.	2017	doi:10.1016/j.colegn.2016.12.001	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small (13) number of participants
8 NZ	Forbes, V.	2018	doi:10.1080/10376178.2018.1484258	Yes	Yes											Yes	Yes	Yes	Yes	Yes	Non-response bias- low number of participants
9 NZ	Adams, S.	2019	doi:10.1071/hc18089	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study (17 participants)
10 NZ	Adams, S.	2020	Adams, S., Boyd, M., Carryer, J., Bareham, C., & Tenbensel, T. (2020). A survey of the NP workforce in primary healthcare settings in New Zealand. New Zealand Medical Journal, 133(1523), 29-40.	Yes	Yes						Yes	Yes	Yes	Yes	Yes						

				SCREENING QUESTIONS		1. QUALITATIVE STUDIES					4. QUANTITATIVE DESCRIPTIVE STUDIES					5. MIXED METHODS STUDIES					
RefID	First author	Year	Citation	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	1.1. Is the qualitative approach appropriate to answer the research question?	1.2. Are the qualitative data collection methods adequate to address the research question?	1.3. Are the findings adequately derived from the data?	1.4. Is the interpretation of results sufficiently substantiated by data?	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?	4.1. Is the sampling strategy relevant to address the research question?	4.2. Is the sample representative of the target population?	4.3. Are the measurements appropriate?	4.4. Is the risk of nonresponse bias low?	4.5. Is the statistical analysis appropriate to answer the research question?	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?	5.2. Are the different components of the study effectively integrated to answer the research question?	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	COMMENTS
1 AUST	Copnell, B.	2004	Copnell, B., Johnson, L., Harrison, D., Wilson, A., Robson, A., Mulcahy, C., . . . Best, C. (2004). Doctors' and nurses' perceptions of interdisciplinary collaboration in the NICU, and the impact of a neonatal nurse practitioner model of practice. Journal of Clinical Nursing, 13, 105-113.	Yes	Yes						Yes	Yes	Yes	Yes	Yes						Loss to follow-up due to inability to follow-up the same participants between 2 surveys
2 AUST	Wilson, K.	2005	Wilson, K., Coulon, L., Hillege, S., & Swann, W. (2005). Nurse Practitioners' experiences of working collaboratively with General Practitioners and allied health professionals in New South Wales, Australia. Australian Journal of Advanced Nursing, 23(2), 22-26.	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study- 9 out of 35 participants
3 AUST	Allen, J.	2005	Allen, J., & Fabri, A. M. (2005). An evaluation of a community aged care nurse practitioner service. Journal of Clinical Nursing (Wiley-Blackwell), 14, 1202-1209.	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study - 25 participants
4 AUST	Turner, C.	2007	doi:10.1111/j.1365-2648.2007.04275.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study- 17 participants
5 AUST	Wand, T.	2007	doi:10.1111/j.1447-0349.2007.00495.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Response bias- small study
6 AUST	Wand, T.	2011	doi:10.1111/j.1447-0349.2011.00744.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study-23 participants
7 AUST	Wand, T.	2011	doi:10.1111/j.1447-0349.2011.00743.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study- response bias
8 AUST	Tori, K.E.	2011	doi:10.1016/j.nurpra.2011.04.003	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study- number of participants not stated
9 AUST	Ling, S.	2013	doi:10.1016/j.colegn.2012.03.010	Yes	Yes						Yes	Yes	Yes	No	Yes						Small study (17)- risk of social desirability bias
10 AUST	Jones, M.	2013	doi:10.1016/j.aenj.2013.02.002	Yes	Yes						Yes	Yes	Yes	No	Yes						Non-response bias
11 AUST	Parker, R.	2013	doi:10.1016/j.colegn.2012.03.001	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Response bias- small study, participants had limited knowledge of NPs
12 AUST	Westbrook, J.	2013	Li, J., Westbrook, J., Callen, J., Georgiou, A., & Braithwaite, J. (2013). The impact of nurse practitioners on care delivery in the emergency department: a multiple perspectives qualitative study. BMC Health Services Research, 13, 356.	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study (14)- may not reflect the population
13 AUST	MacLellan, L.	2015	doi:10.1002/2327-6924.12141	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study (10)- may not reflect the population (1st study)
14 AUST	MacLellan, L.	2017	doi:10.1016/j.ijnurstu.2014.07.006	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Small study (10)- may not reflect the population (2nd study)
15 AUST	Middleton, S.	2016	doi:10.1002/2327-6924.12423	Yes	Yes						Yes	Yes	Yes	Yes	Yes						Non-response bias
16 AUST	Lowe, G.	2013	Lowe, G., Pummer, V., & Boyd, L. (2013). Nurse practitioner in australian healthcare settings. Nurse Management, 20(2), 28-35.	Yes	Yes											Yes	Yes	Yes	Yes	Yes	Non-response bias- small sample size (Phase 1)
17 AUST	Lowe, G.	2018	doi:10.1111/jonm.12624	Yes	Yes											Yes	Yes	Yes	Yes	Yes	Non-response bias- small sample size (Phase 2)
18 AUST	Craswell, A.	2019	doi:10.1111/jan.14176	Yes	Yes																Response bias
19 AUST	Smith, T.	2019	doi:10.1186/s12912-019-0337-z	Yes	Yes	Yes	Yes	Yes	Yes	Yes											Response bias due to small study (20)
20 AUST	Plath, S.J.	2019	doi:10.1016/j.colegn.2018.11.005	Yes	Yes	Yes	Yes	Yes	Yes	Yes											
21 AUST	Weinberg,L.	2020	doi:10.1186/s12960-020-0458-1	Yes	Yes											Yes	Yes	Yes	Yes	Yes	Selection and response bias. Possible cultural institutional bias as all participants worked in the same hospital
22 AUST	Clifford, S.	2019	doi:10.1016/j.colegn.2019.05.006	Yes	Yes											Yes	Yes	Yes	Yes	Yes	Non-respondent bias and respondent bias due to participants only in public sector
23 AUST	Bonner, A.	2020	doi:10.1016/j.colegn.2019.05.006	Yes	Yes						Yes	Yes	Yes	Yes	Yes						Attrition bias due to participants dropping out of study

Appendix C-JCQ Global Center Agreement and Licence

R Karasek Director JCQ Center Global & Øresund Synergy ApS,
Professor Emeritus, Department of Work Environment, University of Massachusetts Lowell, USA &
Professor Emeritus, Work and Organizational Psychology, Institute for Psychology, Copenhagen University, Denmark

Job Content Questionnaire and User's Guide Revision 1.8 10/15 revised policy

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This Packet Contains:

1. Introductory comments, discussion of scales, sample size and statistical equations.
2. Scale construction equations.
3. Occupation and industry category definitions, and our sample size
4. Examples of national mean scores by occupation and industry groups; and subgroup sample sizes.
5. Questionnaire

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List of Revisions:

1. Revision 1.11. revision of scale formula 6/86-R-1.11
2. Revision 1.12 5/94- new content from replaces section
3. Revision 1.5 10/96 – recommend additional scales
4. Revision 1.7 "/97 revised policy
5. Revision 1.8 10/15 revised policy

Appendix D-JCQ User's Guide

About the Job Content Questionnaire

The Job Content Questionnaire is a questionnaire-based instrument designed to measure the "content" of a respondent's work tasks. It focuses on the psychological and social structure of the work situation - issues are relevant to work demands, decision-making opportunities and social interaction. It also includes over twenty other aspects of work and the individual such as physical aspects of work, job insecurity and psychosocial strain "outcomes" scales. No personality scales or measures of non-job stressors are included.

Some of the main advantages in using the JCQ are:

(1) Its theoretical background, its best known scales: Demands, control, and social support are used to measure the job strain[1] and iso-strain[2] model. The discussion of scales is presented in the users guide and in Karasek, et. al. 1998 J Occ Health Psyc.

(2) Scales with predictive power for job related mental strain[3], cardiovascular diseases[4] and musculoskeletal disorders

(3) The U.S. national scores for most of the scales in a wide spectrum sample of jobs; occupation and industry category definitions, and our sample sizes, useful to estimate new studies' sample sizes and statistical significance.

(4) Examples of different occupations characterized by the job strain model based on the U.S. national scores[5,6,7]

(5) Validation studies in samples of different occupations and countries

(6) Its extensive use around the world[6,7] makes it possible to use in different languages and gives access to comparable results.[8]

(7) Its scales are also relevant for studies of worker motivation, job satisfaction, absenteeism and labor turnover

(8) The questionnaire can be used in different formats, according users needs. The Recommended Format has 49 (41) question (see Section II User's Guide [bottom of page]), and a version with limited scales has 27 question. Suggested additional questions about the work environment (22), import of the global economy (5), technology (15), and health and wellbeing outcomes (26), including exhaustion and depression (18). Scale construction equations based on the recommended length formats of the JCQ are presented in the users guide.

The JCQ is copyrighted and not published in the public domain; however, it is the goal of the JCQ Center to make it available to all researchers who request it with substantial supporting documentation, and to promote scientific development in the area via a user's network.

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INTRODUCTORY COMMENTS

1. This is a questionnaire-based instrument designed to measure the "content" of a respondent's work tasks - in a general manner which is applicable to all jobs and job holders in the U.S. The questionnaire scales have been used to predict job related stress and coronary heart disease in the U.S. and Sweden (see report: "Validation Study"). The best known scales are used to measure the high demand/low control model of job strain development, but over twenty other aspects of work and the individual are assessed. The scales are also relevant for studies of worker motivation, job satisfaction, absenteeism and labor turnover.

2. The questionnaire can be characterized as focusing on the psychological and social structure of the work situation - issues relevant to work demands, decision making opportunities, social interaction etc. Physical aspects of work are also measured - but in a very general manner. Several scales measuring psycho-social strain "outcomes" are also included. No personality scales or measures of non-job stressors are included: two areas in which the user may want to suppliment our instrument.

3. Most of the scales are nationally standardizable, allowing users involved in small population or single plant studies to compare their findings to national averages on the scales (broken down by sex and occupation,industry). The nationally standardizability is due to the fact that a "core" of the questions replicates the U.S. Department of Labor's national Quality of Employment Survey of 1969, 1972, and 1977(administered by the U.of Michigan, which we in turn have statistically adjusted to allow combining the three surveys: n=4,500 total for our reference base). Another advantage of the instrument is that its scales are also used in our data base linkage system (using job title) through which job content scores can be associated with health and productivity outcomes in national or company data bases already in existence (such as U.S. Census, Commerce, or NCHS data). This assures the continued validation of the instrument's scales in predicting a broad range of outcome variables.

4. Furthermore, we have designed this questionnaire as the the "Reference Base" of a two part "umbrella" strategy for collecting job data. The users are encouraged to develop the second part themselves: more situation-specific supplementary scales ("under the Job Content Scale umbrella") to measure the detailed problems that are important in the surveyed work site. These new scales can then be correlated to our nationally standardized scales.

5. Permission to use the Job Content Instrument (see section IV).

II. FORMAT: THE INSTRUMENT COMES IN SEVERAL LENGTH FORMATS

1. The minimum "core" of questions represents the 27 questions that are presently being administered in a national follow-up study of the 4,000 offspring of the original Framingham study of U.S. National Heart Lung and Blood Institute. That instrument includes a 9 question scale on decision latitude, 9 questions on psychological work load, 5 questions on physical work load, and 4 questions on job insecurity (questions # 3-11, #19-36). Many of these questions go beyond the original Q.E.S. instrument and will allow us to extend our national standards to a more precise set of scales in the future.(the 18 circled questions are from the original Q.E.S. surveys)

2. *RECOMMENDED FORMAT*

However, for almost all users we recommend that this "Framingham" version be supplemented by important scales omitted from that version of the instrument: social support -

11 questions (#48-58), decision latitude /organizational level - 8 questions (# 12-18 - w/13B); two additional job insecurity questions (#37,38); and the skill level - required question (section IV -#5). This gives a 49 question total; and this is our recommended Standard Job Content Instrument.

3. Many users may wish to further supplement the 49 question version, with scales measuring psychological strain and job dissatisfaction (26 questions total: section II-#V1-V5, measuring job dissatisfaction, and section II-#R1-R8, measuring depression are most strongly recommended). To control for physical hazards at workthat may also contribute to the outcome variables we recommend the 9 question physical hazard and exposure scales (# 39-47).

4. A still more expansive form of the questionnaire includes new scales for human/computer interactions (section III - Technology - 17 questions - see Turner and Karasek , Ergonomics, June 1984); and new scales for work social identity (5 questions) and customer contact problems (7 questions).

5. In all cases basic demographic data (job title, age, sex, race, education, etc) must also be collected somewhere in *your* instrument, (such as our instrument's introductory questions in section I p.1 and section IV , see also the list in section III).

III. "UMBRELLA" SCALES AND THE TWO PART DATA COLLECTION STRATEGY

Each user's survey location has detailed job circumstances which should be specifically measured in greater detail than the broadly worded question in our scales can distinguish. *We encourage users to supplement our instrument with more specific scales of their own construction.* To build these scales we suggest beginning with unstructured interviews of a number of relevant individuals (labor, management) to determine the most salient issues at that site. Formulate these issues so that they can be measured by "expert observers", by monitoring technology, or as a small set of questions added to the instrument (perhaps three to ten questions per isssue). These new measures become your new, "umbrella" scales which you test and administer along with our questions.

How can these new measures be utilized without national comparison standards (such as are available for our scales)? First, correlate these new scales with the Job Content Scales. This will help define the meaning of the new scales in terms of standard reference measures. Then, score each group in your survey on both your new "umbrella" scales and the Job Content Scales. In this manner both the national reference advantages of the Job Content Scales and the site-specific relevance of your own "umbrella" scales can be combined. For example:

> You might be able to conclude that your new scale of "Skill Obsolencence from Automated Data Entry" is correlated to the Job Insecurity and Skill Discretion Scales in the Job Content Instrument; r=.65 and r=-.72, respectively. You might go on to demonstrate that your new scale illustrated a particularly salient problem in Department "A"; while another scale was the best measure of problems in Department "B". Futhermore, you could show thatDepartment "A" and "B" also differ on their scores on the national JobContent Scales for Skill Discretion and Job Insecurity.

III. STANDARD SCALES (See section VI and NIOSH report for detail)

A. Job Content Scales and Demographic Variables

	Computer Label*
- Job Title/Occupation	(3digit Census Occup. Code)
- Industry	(4digit SIC. code)
1. Skill discretion	DISC1
2. Created skills	DISC1A
3. Decision authority	NDISC2
4. Decision latitude ("control")	NDISC12
5. Skill utilization	SKLUTL
6. Psychological job demands ("demands")	DEM13
7. Job Insecurity	JOBSEC
8. Hours worked	HRSWK
9. Total psych. stressors(z-scored addition #6 + #7)	DEMSEC
10. Supervisory responsibilities	SUPERV
11. Union membership	UNION
12. Coworker support	NCOWSUP
13. Supervisor support	NSUPSUP
14. Total social support	NSUPPOR
15. Physical exertion	PHYSDEM
16. Hazardous condition	PHYS4
17. Toxic exposures	PHYS5
18. Total physical hazards(z-scored addit. #16 + #17)	PHYSTOT
19. Total physical stressors(z-scored add. #15 + #18)	PHYPHY
20. Job dissatisfaction	HL8
21. Depression	HL7A
22. Composite psychological strain	PSYTOT
23. Sex	SEX
24. Age	AGE
25. Race	RACE
26. Income from job	SLFINC
27. Education	EDUC
28. Duncan social status	DUNCAN
29. Southern geographical location	SOUTH
30. Rural location	RURAL
31. Firm size	FIRMSZ

*Prefix 'S' for std. deviation

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B.Sample size and Statistical Power of Comparisons

The sample size you will need to verify the statistical significance of a particular difference between your sample and the national scores depends on the statistical relationships discussed in Section V. In general we recommend you have a sample size of at least 100 per occupation group for which you would like to make comparisons. Using our larger,aggrgated occupation (or industriy) groups, a sample size of 50 should allow detection (two-tailed test, $p \geq .01$) of a scale score difference of .5 standard deviations - roughly one fifth of the full range of variation between occupation groups on our scales (see "occupational map" NIOSH report, p. 47). A .75 standard deviation difference could be detected with a smaller sample (making possible comparisons to our detailed occupations (or industries)), but a .25 standard deviation difference would require a much larger sample.

V. SAMPLE SIZE AND STATISTICAL SIGNIFICANCE COMPUTATIONS

The sample size needed by the user is very sensitive to the magnitude of scale difference to be detected between the user's population and the national standard. As an example, a sample size of 50 should be sufficient to confirm a significant difference (using our aggregated occupations or industry scores) of .5 standard deviations - roughly one fifth of the full scale variation that we find between occupations and industries on our scales. Confirming a .75 standard deviation difference can be done with a significantly smaller sample size, and therefore may allow our detailed occupation or industry scores to be utilized. However, to confirm a .25 standard deviation difference will require a substantially larger sample than 50, and would have to be based on the aggregated codes at best. (See discussion and Table 1 below).

We have the full set of Job Content Scale scores for the following sets of national comparison groups, with sub-group sample sizes as follows:

a. Total population (n=4500), Men (n=2950), Women (n=1550)

b. Aggregated occupations-85 groups, and aggregated industry-65 groups. Scores are available similtaneouly broken down as Men, Women or Men plus Women(n≥25 for almost all groups).

c. Detailed 3-digit 1970 U.S. Census Occupation codes (slightly aggregated to n ≥ 3), and 3-digit 1970 U.S. Census Occupation codes (slightlyaggregated to n ≥ 3), and 3-digit (sometimes 4-digit) U.S.Standard Industry codes - both roughly 250 groups each. For occupation codes are available similtaneously broken down as Men, Women,or Men plus Women(average n = 14, but many "n's" as low as 3).

The following formula gives that exact relationships between statistical power, sample size, confidence interval, and our sets of occupation and industry scores, but it requires the standard deviation of each detailed occupation (or industry) group:

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$$t = (\bar{X}_{National} - \bar{X}_{You}) \Big/ \sqrt{\frac{((n_{Nat}-1)std.dev^2_{Nat} + (n_{You}-1)std.dev^2_{You})}{(n_{Nat} + n_{You} - 2)} \left(\frac{1}{n_{Nat}} + \frac{1}{n_{You}}\right)}$$

The formula will give approximately correct results for study design purposes, if the national total population standard deviations are substituted with a correction factor(which is between .65 and .95 depending on the scale (1.0 - Betw.occ. var.); for this and other scale statistics, see NIOSH report). If we further assume that both the "n" of our occupation and the "n" of your sample are ≥ 25, and that your group's scale standard deviations are similar to ours (likely unless your occupations are very narrowly defined), then the formula reduces to the following approximation used to calculate Table 1.

$$\frac{1}{\text{"n"National}} + \frac{1}{\text{"n"You}} = \frac{\text{Diff. in Means}^2 \text{ (\% of std. dev. units)}}{t^2 \text{ (Corection Factor)}}$$

Table 1 shows the "typical" sample size you need, at a given scale difference, at a given level of statistical significance, given our sample size for the occupation you wish to compare with (the "n's" for each occupation and industry group are included in Appendix 1.[NOTE: "n" for PHYSDEM,HL7A, HL8, PSYTOT is only 2/3 the "n" listed in our sample size tables]). The computations also depend on the scale used. We have based our calculations on the Decision Latitude scale: its high between-occupation variance diminishes the needed sample size somewhat. The calculations are also based on a two-tailed test for significance (direction of the difference in the means is not known a priori). A one-tailed test can reduce the sample needed significantly. Because of these approximations we suggest the user *add 50%* to the "n" so calculated.

TABLE1: USER SAMPLE SIZE ("n"You), GIVEN NAT. SAMP. GROUP SIZE ("n"Nat)

	Difference in Means					
	.75 std. dev.		.50 std. dev.		.25 std. dev.	
	"n" Nat	"n" You	"n" Nat	"n"You	"n" Nat	"n" You
Confid.						
p≤ .10	6	9	6	not.pos	6	not.pos
	11	5	11	25	11	not.pos
	20	5	20	12	20	not.pos
	40	4	40	9	40	95
	80	4	80	8	80	44
	160	4	160	8	160	35
p≤ .05	6	40	6	not.pos	6	not.pos
	11	9	11	>1000	11	not.pos
	20	7	20	20	20	not.pos
	40	6	40	14	40	>1000
	80	6	80	12	80	80
	160	5	160	11	160	53
p≤ .01	6	not.pos	6	not.pos	6	not.pos
	11	33	11	not.pos	11	not.pos
	20	13	20	120	20	not.pos
	40	10	40	30	40	not.pos
	80	9	80	22	80	500
	160	8	160	19	160	121

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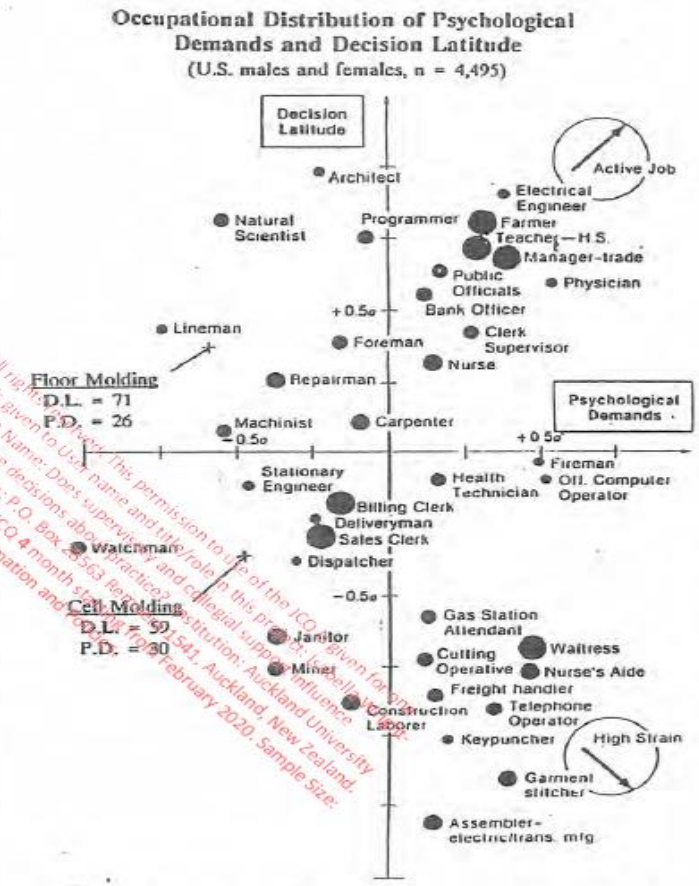
Case Study of the Characterization of Psychosocial Load in a Molding Department using the JCQ

Psychosocial load was assessed for two molding operations within the same department at a company that manufactures specialty elastomer products. The molding operation that was in existence since the founding of the company (at least 25 years) was referred to as the "Floor" operation, since this work was performed in an area called the molding floor. The other operation, referred to as the "Cell", was in existence for 1 1/2 years at the time of the psychosocial load investigation. The name of this second operation reflects the cellular layout of the work area to facilitate Just-In-Time (JIT) production.

Although the same molding technology was employed, the two operations had distinct organizational characteristics. The Floor molders worked independently at their assigned machines, and they processed their work orders in a batch mode. The Cell molders worked as a team of three and shared responsibility for coordinating all molding functions and the added task of packaging. Only high production volume molds were processed in the Cell, and thus the Cell operated more as a mass production operation employing JIT techniques. Unlike the Floor process, the production cycle, product quality, and material usage was strictly monitored in the Cell.

The average response values for all questions of the Job Content Questionnaire (JCQ) were obtained for both work groups using Mystat, a demo version of the software package Systat (Lotus or any other statistical package should suffice). The average values were substituted into the appropriate scales (equations) to generate scores for decision latitude and psychological demands. Then, using the mean scale scores for U.S. census occupations as a guide, the approximate location of each molding process was determined and plotted on the occupational map (see figure to the right). Floor work was found to be positioned in the low strain quadrant and Cell work was found to be positioned in the passive quadrant.



Source: Robert Karasek and Töres Theorell: Healthy Work, published by Basic Books 1990. Data from Quality of Employment Surveys 1969, 1972, 1977.

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Table 1: List of Job Content Questionnaire questions:6/94 Rev1.5(10/96)

Recommended Format (49 q.)

(abbreviated text - see JCQ User's Guide for full text)

* questions excluded in shorter the "Framingham Version "of theJCQ (27 questions)
# JCQ questions added (to the Q.E.S.) at the time of the development of the original JCQ (v. 1.1) in 1985

D. L. = Decision Latitude=Skill Discretion + Decision Authority.

S. D. = Skill Discretion (Q3, 4, 5, 7, 9, 11; IV-5§)

1. Q3 "learn new things"
2. Q4 "repetitive work"
3. Q5 "requires creative"
4. Q7 "high skill level"
5. Q9 "variety"
6. Q11 "develop own abilities"

7. *QIV-5§ "education required by job"
(- used for a separate skill underutilization scale [includes educ.])

D. A. Decision Authority (Q6, 8, 10)

1. Q6 "allows own decisions"
2. Q8 "little decision freedom
3. Q10 "lot of say"

***M. D. =Macro-level Decision Authority** (Q12, 13a, 13b, 14, 15, 16, 17, 18)

1. *Q12 "work group size"#
2. *Q13A "significant influence in group"#
3. *Q13B "democratic group"#
4. *Q14 "some influence/company"#
5. *Q15 "supervise others"#
6. *Q16 "union member"#
7. *Q17 "union influence/company"#
8. *Q18 "have union influence"#

Ps. D. = Psychological Job Demands (Q19, 20, 22, 23, 26, 27, 28, 29, 32)

1. Q19 "work fast"
2. Q20 "work hard"
3. Q22 "no excessive work"
4. Q23 "enough time"
5. Q26 "conflicting demands" *
6. Q27 "intense concentration" #
7. Q28 "tasks interrupted" #
8. Q29 "hectic job" #
9. Q32 "wait on others" #

Ph. D. = Physical Job Demands (Q21, 24, 25, 30, 31)

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1. Q21 "much physical effort"
2. Q24 "lift heavy loads" #
3. Q25 "rapid physical activity" #
4. Q30 "awkward body position" #
5. Q31 "awkward arm positions" #

J. I. =Job Insecurity (Q33, 34, 35, 36, 37, 38)
1. Q33 "steady work"
2. Q34 "job security"
3. Q35 "recent layoff"#
4. Q36 "future layoff"
5. *Q37 "career possibilities" #
6. *Q38 "my skills valuable" #

***S. S. =Supervisor Social Support** (Q48, 49, 50, 51, 52)
1. *Q48 "supervisor is concerned"
2. *Q49 "supervisor pays attention"
3. *Q50 "hostile supervisor" #
4. *Q51 "helpful supervisor"
5. *Q52 "supervisor good organizer"

***C. S. =Coworker Social Support** (Q53, 54, 55, 56, 57, 58)
1. *Q53 "coworkers compenent"
2. *Q54 "coworker interest in me"
3. *Q55 "hostile coworkers" #
4. *Q56 "friendly coworkers"
5. *Q57 "coworkers work together"#
6. *Q58 "coworkers helpful"

New JCQ questions added 6/94 - revision 1.5

G. C. =Global Competitive Effects (QN-1, N-2, N-3, N-4, N-5)
1. Q-N1 "job insecurity from global competition"
2. Q-N2 "increased job demands from global competition"
3. Q-N3 "reduced job control from global competition"
4. Q-N4 "little I can do"
5. Q-N5 "future depends on me"

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Appendix E-JCQ Formulae for Scale Construction

VI. FORMULAE FOR JOB CONTENT INSTRUMENT SCALE CONSTRUCTION

Skill Discretion = [Q3 + Q5 + Q7 + Q9 + Q11 + (5 - Q4)] x 2*
Created Skill = [Q3 + Q5 + Q11] *(rev 6/86)
Decision Authority = [Q6 + Q10 + (5 - Q8)] x 4*
Decision Latitude = Skill Discretion + Decision Authority
Skill Utilization = IV.5 - Education <both coded in years>
Psychol. Job Demands = [(Q19 + Q20) x 3 + (15 - (Q22 + Q23 + Q26)) x 2]
Job Insecurity = [Q33 + Q36 + (5 - Q34)]
Hours Worked = IV.1 <hours>
Total Psyc. Stressors = Z-scored addition of Psyc. Job Dem + Job Insec.
Supervisory Responsibility = Q15 <1 = none, 5 = yes>
Union Membership = Q16 <1 = no, 5 = yes>
Coworker Support = [Q53 + Q54 + Q56 + Q58]
Supervisor Support = [Q48 +Q49 + Q51 + Q52]
Social Support = Coworker Support + Supervisor Support
Physical Exertion = Q21
Hazardous Conditions = [Q41 + Q42 + Q44 + Q45 + Q47]
Toxic Exposures = [Q39 + Q40 + Q43]
Total Physical Hazards = z-scored addition of Hazard Cond + Tox Expos.
Total Physical Stressors = z-scored addit. of Phys Exer + Tot Phys Haz
Job Dissatisfaction = [(V3 + V5 - V2 - V4) * 3 - (V1 * 4) + 40] / 60
Depression (Life Dissatis) = [R2 + R3 +R4 + R5 + R6 + R7 + R8 - R1] / 48
Physic/Psychosom Strain = $[(4 - V6)^2 + (4 - V11)^2 + (4 - V12)^2 + (4 - V13)^2]/36$
Sleeping Problems = $[(4 - V14)^2 + (4 - V15)^2]$ / 18
Compos. Psych. Strain = z-scored add.of Job Diss+Depr+Physic/Psyc+Sleep

THE FOLLOWING MUST BE GATHERED SOMEWHERE IN *YOUR* INSTRUMENT:
Sex <1 = male, 2 = female>
Age <years>
Race <1 = white, 0 = non-white>
Education <years>
Income from Job (IV.3) < 000's dollars/year>
Southern Location <1 = yes, 0 = no>
Rural Location <1 = yes, 0 = no>
Firm Size <number of employees at your location>
Job Title <3-digit US Census Occupation code. This determines Duncan SES>
Industry <3-digit SIC codes are desirable, but broad industry is sufficient>

Copyright Kauppinen, Gilbert, Gadbois & Deeney, 1986. All rights reserved. Permission to use of the JCQ is given for dissertation research purposes only. Users name and title/role in this project, supervisory and collegial support, Institution: Auckland University of Technology, Faculty of Health and Environmental Sciences, P.O. Box 92006, Auckland 1142, New Zealand. Phone 09 9219999 ext 28563 Remuera 1541, Auckland, New Zealand. Timeperiod of the study: JCQ 4 month starting from February 2020. Sample Size: Doctoral candidate: Isabella Wright. Name of supervisor: Dr Jo Hale. Name of associate supervisor: Dr Jo Hale. Freedom of choice: participation is voluntary and participants can withdraw at any time without penalty. Confidentiality: Participants will remain anonymous. Data will be destroyed after 5 years. Benefits: Participants will receive a report about the findings. Risks: Time required to complete JCQ: 400. Compensation: for more information see JCQ Information and Policies.

ADDITIONAL SCALES AND FORTHCOMING SCALE EXTENSION

These new scales have not yet been validated on a national sample, but are currently being used by researchers, and we expect validation information to accumulate soon. We suggest the following formats for initial scale construction attempts.

Additional Scales in the "Recommended Format" Instrument:

Decision Latitude - Group = [Q13A + Q13B] (=missing value<recode to 0> if Q12 = 1)
Decision Latitude - Formal = [Q14 + Q15]
Decision Latitude - Union = [Q17 + Q18] (=missing value<recode to 0> if Q16 = 1)
Decision Latitude Macro = [Dec.Lat.-Group + D.L.-Formal + D.L.-Union] /3*
*(/2 if Q12 or Q16 =1; /1 if Q12 and Q16 = 1)
Job Insecurity 2 = [Q33 - Q34 + Q35 + Q36 - Q37 -Q38]

Extensions of original scales for Framingham version of instrument:

Physical Exertion(FR) = [Q21 + Q24 + Q25]
Physical Isometric Loads = [Q30 + Q31]
Psyc.Job Dem.(FR) = [Q19 + Q20 - Q22 - Q23 - Q26 + Q27 + Q28 + Q29 + Q32]
Job Insecurtity(FR) = [Q33 - Q34 + Q35 + Q36]

ADDED SCALES

Customer Relationships = [Q59 + Q60 + Q61 + Q62 + Q63 - Q64]
Self-Identity Through Work = [Q65 + Q66 + Q67 + Q68 + Q69 + Q70]
Muscle Aches = [V7 + V8]
Suspect Heart Disease =[V9 +V10 + V16]

NEW TECHNOLOGY SCALES (Section III of questionnaire)

Value of New Skills = [III.2 - III.3 + III.15]
Control over Equipment = [III.4 - III.5 - III.7]
Addition Work Load = [III.12 + III.14 + III.18]
Capacity of Equipment = [III.10 + III.11 + III.13 - III.6]
Type of Technology = III.9, III.16, III.17 - no scale intended

OTHER QUESTIONS

- Shift Work, Work Schedule Flexibility = 1V.2, 1V.4 - no scale intended
- Work Group Size = Q12
- Substance Abuse = V17(tranquillizers), V18(smoking) - no scale intended
- Additional Supervisor Support Question = Q69
- Additional Coworker Support Question = Q71

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Appendix F-NP Job Content Questionnaire

Nurse Practitioner Job Content Questionnaire

Participant Information Sheet

Project Title: *A cross-sectional study of Nurse Practitioner decision-making in New Zealand.*

An Invitation: *My name is Isabella Wright, and I have been a Nurse Practitioner in New Zealand for the last eight years. I am passionate about advanced nursing practice, and therefore as part of my Doctor of Health Science degree, I decided to focus my research on Nurse Practitioners. I invite you to participate in online survey. The research aims to better understand decision-making by Nurse Practitioners.*

What is the purpose of this research? *A significant rise in long-term conditions in NZ is changing the focus of how health services are delivered. In NZ, NPs make an important contribution to care. NPs can contribute to the change in the current health care system and positively impact on the population they care for, in particular people living with long-term conditions, and reduce disparities related to unequal access to health services by populations living in deprived and rural areas in NZ. This study will explore the NPs working in District Health Boards, Primary Care, Community and Residential Aged Care. The findings of this research will be published in peer-reviewed journals, conference presentations, as well as being published as a Doctor of Health Science thesis. It will not be possible to identify any of the participants in this research.*

How was I identified and why am I invited to participate in this research? *You are invited to participate in this study because you are Nurse Practitioners currently registered with the New Zealand Nursing Council. A three-monthly recruitment strategy includes emailing the online survey to NPs, one month apart.*

How do I agree to participate in this research? If you decide to participate in this research, you will be asked to complete an online Consent Form (section below), before beginning the online survey. Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You do not have to answer a question if you do not wish to do so. A link in the invitation email will be provided to access the online survey. Once the survey has been submitted, you will not be able to withdraw your data from the study, as your data is anonymous and will not be able to be identified as belonging to you.

What are the discomforts and risks?: *It is not expected that participation in this research will involve any discomfort or risk. However, if at any time you feel anxiety about participation you may contact the lead researcher Dr. Eamon Merrick or confidentially contact the Auckland University of Technology Counselling and Well-Being service.*

What are the benefits?: *The benefits of this research are to obtain an understanding of NP decision-making in a variety of practice environments. The research may identify work barriers or challenges for NPs, which can be addressed by a professional organization to influence national health policy.*

What are the costs of participating in this research?: *Your time to complete the survey is approximately 10 mins.*

What opportunity do I have to consider this invitation?: *You will have a month to complete the online survey.*

Will I receive feedback on the results of this research?: *A one or two page summary will be provided to the participants and will be disseminated by NPNZ, as well as the private group NPNZ Facebook page.*

What do I do if I have concerns about this research? *Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Eamon Merrick, eamon.merrick@aut.ac.nz, (+649) 921 9999 ext. 8179* Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz*, (+649) 921 9999 ext. 6038.

Whom do I contact for further information about this research?
You are able to contact the research team as follows: Researcher Contact Details: Isabella Wright, gcg0278@autuni.ac.nz, (+649) 921 9999 ext. 7405
Project Supervisor Contact Details: *Dr Eamon Merrick, Eamon.merrick@aut.ac.nz, (+649) 921 9999 ext. 8179* Prof. *Stephen Neville, Stephen.neville@aut.ac.nz, (+649) 921 9379*

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted,* AUTEC Reference number *type the reference number.*

Start of Block: Consent

C1, I have read and understood the information provided about this research project in the Participant Information Sheet (previous page)

○ Yes (1)

C2, I understand that I'm providing consent by taking part in the survey.

○ Yes (1)

C3 Please answer all the questions in the survey to the best of your ability.
You do not need to answer a question if you do not wish to do so.

End of Block: Consent

Start of Block: Demographics

Q1 What is your gender?

- Male (1)
- Female (2)
- Gender diverse (3)

Q2 What is your age?

- 25-29 years (1)
- 30-39 years (2)
- 40-49 years (3)
- 50-59 years (4)
- 60+ years (5)

Q3 What is your Ethnicity?

- European (1)
- Māori (2)
- Pacific Peoples (3)
- Asian (5)
- Middle Eastern/ Latin American/ African (6)
- Other Ethnicity (4) _____

Q4 Current employment setting

- DHB (1)
- Primary care (2)
- Residential aged care (3)
- Rural / community (4)
- Private hospital (5)
- Other (6) _____

Q5 Current area of clinical specialty

- Acute/ Critical Care (1)
- Emergency (2)
- Pediatrics (3)
- Primary care (4)
- Coronary care/ Heart failure (5)
- Older adult (6)
- Adult (7)
- Diabetes (8)
- Chronic conditions (9)
- Respiratory (10)
- Renal (11)
- Palliative care (12)
- Sexual and women's health (13)
- Mental health (14)
- Other (15) _____

Q6 Demographic location of main practice

- Enter post code (1) _____

Q7 How long have you been practicing as a Nurse Practitioner?

- Less than 1 year (1)
- 2-5 years (2)
- Longer than 6 years (3)

Page Beak

End of Block: Demographics

Start of Block: Job Content Survey

Q8 My job requires that I learn new things

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q11 My job involves a lot of repetitive work.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q12 My job requires me to be creative

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q13 My job allows me to make a lot of decisions on my own

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q14 My job requires a high level of skill.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q15 On my job, I have very little freedom to decide how I do my work.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q16, I get to do a variety of different things on my job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q17, I have a lot of say about what happens on my job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q18, I have an opportunity to develop my own special abilities.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q19 How many people are in your work group or unit?

- ○ I work alone (1)
- ○ 2-5 people (2)
- ○ 6-10 people (3)
- ○ 10-20 people (4)
- ○ More than 20 people (5)

Q20, I have significant influence over decisions in my work group or unit.

	I work alone (1)	Strongly disagree (2)	Disagree (3)	Agree (4)	Strongly agree (5)
Select one answer (1)	○	○	○	○	○

Q21 My work group or unit makes decisions democratically.

	I work alone (1)	Strongly disagree (2)	Disagree (3)	Agree (4)	Strongly agree (5)
Select one answer (1)	○	○	○	○	○

Q22 I have at least some chance that my ideas will be considered about company policy (e.g. hiring policy, practice decisions, patient care, equipment purchases)

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q23 I supervise other people as part of my job

	No (1)	Yes- 1-4 people (2)	Yes- 5-10 people (3)	Yes- 11-20 people (4)	Yes- more than 20 people (5)
Select one answer (1)	○	○	○	○	○

Q24 I am a member of a union or a professional organization.

	Yes (1)	No (2)
Select one answer (1)	○	○

Q25 My union or professional organization is influential in affecting company policy.

	I'm not a member (1)	Strongly disagree (2)	Disagree (3)	Agree (4)	Strongly agree (5)
Select one answer (1)	○	○	○	○	○

Q26, I have influence over the policies of the union or professional organization.

	I'm not a member (1)	Strongly disagree (2)	Disagree (3)	Agree (4)	Strongly agree (5)
Select one answer (1)	○	○	○	○	○

Q27 My job requires working very fast.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q28 My job requires working very hard

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q29 My job requires lots of physical effort

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q30 I am not asked to do an excessive amount of work

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q31 I have enough time to get my job done

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q32 I am often required to move or lift very heavy loads in my job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q33 My work requires rapid and continuous physical activity.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q34 I am free from conflicting demands that others make.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q35 My job requires long periods of intense concentration on the task.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q36 My tasks are often interrupted before they can be completed, requiring attention at a later time.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q37 My job is very hectic

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q38 I am often required to work for long periods with my body in physically awkward positions

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q39 I am required to work for long periods with my head or arms in physically awkward positions.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q40 Waiting on work from other people or departments often slows me down on my job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q42 How steady is your work? (check one)

- ○ Regular and steady (1)
- ○ Seasonal (2)
- ○ Frequent layoffs (3)
- ○ Both seasonal and frequent layoffs (4)
- ○ Other (5) _____

Q43 My job security is good.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q44 During the past year, how often were you in a situation where you faced job loss or layoffs?

	Never (1)	Faced the possibility once (2)	Faced the possibility more than once (3)	Constantly (4)	Actually layed off (5)
Select one answer (1)	○	○	○	○	○

Q45 Sometimes people permanently lose jobs they want to keep. How likely is it that during the next couple of years you will lose your job with your employer?

	Not at all likely (1)	Not too likely (2)	Somewhat likely (3)	Very likely (4)
Select one answer (1)	○	○	○	○

Q46 My prospects for career development and promotions are good

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q47 In five years, my skills will still be valuable

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q57 My supervisor is concerned about the welfare of those under him/ her.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)	I have no supervisor (5)
Select one answer (1)	○	○	○	○	○

Q58 My supervisor pays attention to what I am saying.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)	I have no supervisor (5)
Select one answer (1)	○	○	○	○	○

Q59 I am exposed to hostility or conflict from my supervisor.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)	I have no supervisor (5)
Select one answer (1)	○	○	○	○	○

Q60 My supervisor is helpful in getting the job done

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)	I have no supervisor (5)
Select one answer (1)	○	○	○	○	○

Q61 My supervisor is successful in getting the people to work together

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)	I have no supervisor (5)
Select one answer (1)	○	○	○	○	○

Q62 People I work with are competent in doing their jobs

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q63 People I work with take a personal interest in me.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q64 I am exposed to hostility or conflict from the people I work with

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q65 People I work with are friendly

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q66 People I work with encourage each other to work together

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q67 People I work with are helpful in getting the job done

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q68 I often get information feedback one way or another about how the customers or clients feel about the product or service I produce.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q69 I often get to know clients or customers as individuals on my job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q70 One way or another, customers or clients can influence the kind of product or service I produce.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q71 I can affect what the clients or customers want

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q72 Satisfying the customer provides me with an important source of challenges on the job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q73 I am subject to hostility or abuse from clients or customers

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q74 My knowledge about the customer's satisfaction is a major source of my feelings of being important and valuable on the job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q75 My work group or unit makes an important contribution to society.

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q76 I am appropriately respected and rewarded by my company for my work

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q77 My skills and abilities are "vital" to my work, group or unit

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q78 I get information feedback from my supervisor about how well I do my job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q79, I produce a whole or identifiable product or service in my job- that is, I can easily "point out" my contribution to the final product or service

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

Q80, I get information feedback from my co-workers about how well I do my job

	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
Select one answer (1)	○	○	○	○

End of Block: Job Content Survey

Start of Block: Block 4

Thank you for taking time to complete the survey.

End of Block: Block 4