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EDITORIAL

The care economy: a catalyst for inclusive and sustainable growth

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The care economy, encompassing paid and unpaid work in health, aged, and disability care, personal care, and education, forms the bedrock of a thriving and equitable society. Its reach extends beyond these sectors, influencing everything from employer-employee relations such as via an employer's duty of care for its workers to social movements for equality. Care serves as a crucial driver of growth, prosperity, well-being, and equity, but is often misunderstood and deemed to be a burdensome cost to governments and business rather than a resource and investment with huge capacity for beneficial returns.

A robust care economy fosters increased productivity, gender parity, workforce participation, educational attainment, business profitability, and social cohesion, all while reducing long-term social spending. Importantly, a well-functioning and supported care economy is a strong driver of equity for people from vulnerable and often underrepresented groups including women, culturally and linguistically diverse people and migrants, and First Nations people. As noted above, investments in the care economy can cut across numerous sectors not traditionally associated with 'care'. For example, programs that might be considered primarily environmental in focus can support Indigenous Peoples in remote communities to work as rangers and in land and sea management. Such programs can have important benefits to health and wellbeing, employment, the local economy, society, and culture.¹

Investing in the care economy is paramount for building an inclusive, sustainable, and resilient future, which Governments are just beginning to understand.² It strengthens opportunities for economic growth, demographic planning, infrastructure development, climate resilience, technological integration, and skills mobility. Historically championed by women's rights movements,³ the care economy's potential has often been downplayed in a similar fashion to how women's work and industries that are largely made up of women such as nursing and midwifery have been.⁴ Recent crises such as the COVID-19 pandemic

have, however, highlighted the critical role of care systems to the function of economy and society more broadly, necessitating their support at all levels.⁵

Despite the general easing of specifically pandemic-related pressures, the ongoing crisis in the care sector and across economies more broadly hinders post-pandemic recovery, equity, and growth. To unlock the care economy's full potential, strategic investment and collaboration between stakeholders across public, private, and civil sectors is essential.

THE COMPELLING CASE FOR INVESTMENT

Globally, around 136 million people work in the health and social care sectors and three quarters of these are women. Nurses make up about a quarter of all workers in health and social care in Organisation for Economic Co-operation and Development (OECD) countries and the number of care workers across aged care, disability care, and child care is also growing.⁶ In Australia, there are over 460,000 workers across personal care and support, allied health, welfare, and nursing and almost 80 percent are women with 40 percent born overseas.⁷ Eleven percent hold multiple jobs and almost 30 percent are employed in casual roles.⁷

Beyond those employed in the care work, the unpaid component of the care economy is estimated to contribute a staggering 9 percent of global gross domestic product (GDP), equivalent to \$11 trillion, delivered by a workforce of nearly 2 billion.⁸ This vast pool of unpaid labour presents immense opportunities for job creation, income generation, and social mobility. Studies suggest that investing in the United States social sector, including paid care, could yield triple benefits; a \$1.3 trillion investment translating to \$3.1 trillion in GDP, 10 million social sector jobs, and an additional 1 million jobs in other sectors.⁸ With investment, equivalent returns could be expected in Australia and other contexts.

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Well-functioning and supported care systems not only promote equity but also acknowledge the economic value of care. This necessitates investments in resources, infrastructure, and fair compensation for care providers. Key inequities hindering the care economy include overreliance on unpaid care (often by underrepresented groups like women), precarious working conditions in the paid care sector (including casualisation of work, gig work, and reliance on low paid workers), and limited and inequitable access to care services and resources.

Overreliance on unpaid care, primarily by women, diminishes its social and economic value. It underestimates the demand for care services and delays solutions to address care gaps. Older women can be especially overlooked, with one recent study from the United Kingdom highlighting how around half of all family carers are grandparents and mostly women.⁹ Likewise, precarious work in the paid care sector, often reliant on low-wage female migrant workers, further undervalues the care economy.¹⁰ Finally, lack of access to care, such as lack of support for childcare or paid parental leave, particularly for women and disadvantaged groups, restricts education, training, and employment opportunities, hindering social mobility and economic well-being.

A recent White Paper published by the Global Future Council of the World Economic Forum highlights three interrelated trends that necessitate immediate investment in the care economy: rising demand for care due to an aging population and shrinking workforce, a growing need for care workers, and strong economic prospects for care-related skills that are not easily automated (e.g., human engagement). Two compelling arguments are also advanced that support investment: firstly, increased public spending in the care economy generates a greater multiplier effect on employment compared to other sectors like construction. Secondly, providing care benefits in the private sector (paid leave, childcare, flexible work) reduces costs for employers by addressing productivity losses due to care-related absences and turnover.

BUILDING SUCCESSFUL COLLABORATIVE CARE ECONOMIES

As the care economy has interfaces and influences across every level of society and the economy, intersectoral collaboration is vital to its successful operation and key to fulfilling its future potential.^{11,12} A three-pronged framework proposed by the Global Future Council could provide guidance for the development of a robust care economy.⁸ This proposed framework explains how reimagined care networks, design principles, and success factors each play a part in determining the success and sustainability of a well-functioning care economy. Reimagined care networks emphasise the importance of close collaboration between governments, businesses, and communities and

acknowledge the need to distribute roles and responsibilities across each sector. Such collaboration is critical to endeavours such as training, recruiting, and retaining an effectively distributed and sustainable skills mix of healthcare workers.¹³ The White Paper also proposes four key design principles for investments and interventions that are necessary for an effective care economy. These emphasise accessibility, quality, sustainability, and co-responsibility and articulate the importance of identifying the key characteristics needed for understanding what works in unique and diverse contexts when aiming to meet a range of care needs. Finally, underlying the success of care economies are several critical factors. These include strategic articulation across government, public, and private sectors to prioritise and address care economy barriers with collaborative solutions, an engaged leadership, and data-driven approaches to inform interventions with high-quality, contextual evidence.

The care economy, encompassing both paid and unpaid care work and largely driven by women, is essential for a thriving and equitable society. While often undervalued, the care economy when well supported contributes significantly to social well-being, economic growth, and gender parity. Strategic investments in care infrastructure, workforce development, and fair compensation are crucial to address current challenges and unlock the care economy's full potential. Such investments can foster job creation, social mobility, and equity for vulnerable groups. Collaborative efforts across public, private, and civil sectors and between stakeholders in each are necessary to build a robust and sustainable care economy, ultimately leading to a more inclusive and prosperous future for all. By recognising the care economy's true worth and investing strategically, we can unlock its potential for a more inclusive, sustainable, and prosperous future for all.

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Oncology nurses' practices on diagnosis, prevention, and management of delirium

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ABSTRACT

Objective: To determine oncology nurses' practices about the diagnosis, prevention, and management of delirium.

Background: Delirium can occur at any stage of the disease process of patients with cancer, or it can develop when the first diagnosis is learned.

Study Design and Methods: A cross-sectional design was used. The study was conducted between May 10 and July 16, 2021 in Turkey with 181 nurses who worked in the oncology units of public and private hospitals and were reached by using the snowball sampling method. Data were statically analysed.

Results: Of the nurses, 48.6% have a bachelor's degree and the average working years in oncology is 6.61 ± 5.47 , 38.1% had been making routine delirium assessments, and only 5.5% of these nurses had prior experience using a screening tool. Also, 38.1% of the nurses had difficulty diagnosing delirium, with the patient group they had difficulty diagnosing most often being patients with dementia, hypoactive delirium, and those who were sedated, respectively. The rate of nurses who worked with a patient with delirium in the last month was 31.5%, and 40.3% could not determine the type of delirium. While the nurses' definition of hyperactive delirium findings was

high, their definition of hypoactive delirium findings such as lethargy (48.8%), decreased psychomotor activity (47.7%) and withdrawal (56.1%) was low. In the study, it was found that being male, having an undergraduate degree in nursing, having professional work experience, having a lower patient-to-nurse ratio, using a screening tool, having experience working with patients diagnosed with delirium, and having positive views on delirium treatment had a significant impact on nurses' routine follow-up of delirium ($p < 0.05$). In addition, it was determined that those who had experience working with patients diagnosed with delirium had less difficulty diagnosing delirium ($p < 0.05$). Also, 82.4% of the nurses stated that they first applied pharmacological treatment after the diagnosis of delirium and that they most frequently used haloperidol (35%), benzodiazepine (29.8%) and dexmedetomidine (22.8%). Although nurses were self-confident about the management of delirium, they thought that it was difficult to prevent and treat delirium in patients with cancer.

Conclusions: Although approximately one-third of the nurses had cared for patients diagnosed with delirium in the last month, the rate of using a measurement tool for routine delirium screening and diagnosis was low.

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Implications for research, policy, and practice:

It was concluded that it was important to support the education of nurses with case examples in in-service or certificate programs, workforce planning should be made according to patient/nurse ratios, and evidence-based care procedures should be prepared and implemented so that oncology nurses could do routine follow-up of delirium in patients diagnosed with cancer, use a valid and reliable screening tool, and manage effectively and appropriately delirium.

What is already known about this topic?

- Although the incidence of delirium is high in cancer patients, it is not always diagnosed appropriately or managed effectively.
- Despite the factors limiting diagnosis and treatment in cancer patients, 40% of delirium cases can be prevented.
- Delirium is a syndrome that can be managed with pharmacological and non-pharmacological applications.

What this paper adds:

- In the diagnosis and management of delirium, whether nurses use screening tools and do routine follow-up, the level of their education, their experience working with patients diagnosed with delirium, the number of patients they provide care for, their self-confidence, and their positive attitudes towards delirium are factors that impact on the diagnosis and outcomes.
- Nurses should be supported with case-based education that will increase their knowledge and skills regarding the diagnosis and management of delirium in patients diagnosed with cancer. This approach will increase nurses' experience before they encounter a patient with delirium.
- For effective diagnosis and management of delirium, workforce planning should consider patient/nurse ratios in oncology units as a workload management and patient safety measure.
- It is recommended to prepare and implement institutional care procedures for the diagnosis, management and follow-up of delirium in oncology units.

Keywords: Delirium; Diagnosis; Management; Nurse; Oncology

OBJECTIVE

To determine oncology nurses' practices about the diagnosis, prevention, and management of delirium.

BACKGROUND

Delirium is an acute confusional state in which there are fluctuations in the level of consciousness during the day resulting from organic brain dysfunction.¹ Delirium can occur when cancer is first diagnosed or at any stage of the disease.² The incidence of delirium in patients with cancer is between 13-85%.³ In a study conducted by Sieber et al., delirium was observed in 36% of the patients with malignancy, and the incidence of delirium development was higher in patients with liver, lung, and colorectal malignancies, respectively.⁴ It has been reported that this variance in the incidence of delirium differs according to the delirium assessment method used in studies, education of personnel, and the delirium subtype.^{1,5,6} Hyperactive delirium is often associated with agitation and discomfort, and increased psychomotor activity makes delirium easily recognized.^{2,6} In hypoactive delirium, findings such as withdrawal and lethargy, which manifest themselves with a decrease in psychomotor activity, are dominant. Therefore, it is more likely to be overlooked.^{2,6}

Delirium is a syndrome that increases morbidity, mortality, and cost of care in patients with cancer and affects the care burden of patients and healthcare professionals.^{4,7,8} In a prospective cohort study, it was determined that the presence of delirium in patients with cancer increased the risk of mortality by a factor of six.⁹ It was found that 40.2% of palliative care patients receiving inpatient treatment in a tertiary health center in Mexico developed delirium and that the average life expectancy was 11 days in patients with delirium but 21 days in patients with no delirium.⁷

Considering the effects of delirium on patient outcomes, early and accurate diagnosis with a reliable and valid measurement tool is very important.¹⁰ Diagnosis of delirium in patients with cancer can be difficult due to the failure to use guidelines and assessment protocols for delirium, lack of communication within the team, and clinical characteristics of delirium.^{11,12} Although there are guidelines for the management of delirium in cancer patients, the inconsistent awareness of nurses about the recommendations in these guidelines or the lack of an institutional guide-based care procedure may support the inadequacy in diagnosis.^{6,13} Nurses' diagnosis of delirium in patients with cancer is affected by factors, such as the presence of dementia and depression in the patient, advanced age, visual and hearing impairment, the presence of hypoactive delirium, fluctuating

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course of delirium symptoms, health professionals' lack of knowledge, and inconsistent use of screening tools.¹⁴ Lack of routine delirium monitoring with a delirium screening tool in patients with cancer is mostly associated with a poor prognosis, and treatment can be difficult due to multifactorial reasons.^{15,16} In a study on the characteristics of patients with malignancy who developed delirium in the intensive care unit, it was found that patients were older and had a higher disease severity score, incidence of sepsis and septic shock, and length of stay in the unit.⁴

In the European Society for Medical Oncology (ESMO) Clinical Practice Manual, it has been noted that oncology nurses are concerned about how to evaluate delirium and how to manage delirium during evening and night shifts.⁶ De la Cruz et al., found that delirium could not be detected in 61% of patients hospitalised in cancer care centers and that delirium findings were evaluated as pain.¹⁷ According to the ESMO, Clinical Practice Guidelines for Delirium in Adult Cancer Patients (2018), the diagnosis of delirium should be made by an appropriately educated and competent healthcare professional using the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) or International Classification of Diseases (ICD-10) criteria.¹⁷ The Memorial Delirium Assessment Scale (MDAS) and the Delirium Rating Scale Revised-98 (DRS-R98) are used to less often evaluate the severity of delirium in patients with cancer.^{6,13} The Confusion Assessment Method (CAM), on the other hand, is a reliable and valid tool for diagnosing delirium rapidly by health practitioners with the appropriate training and education.¹⁸ While DSM-5 and ICD-10 are delirium diagnostic tools mostly used by doctors, CAM is a diagnostic tool that nurses can use easily and safely.¹⁸ According to The ESMO Clinical Practice Guideline, since there are no randomised controlled trials on screening for delirium in patients with cancer, there is not enough evidence to recommend the routine use of screening tools in diagnosing delirium.⁶ For this reason, if there is any change in cognitive or emotional behaviour or psychomotor activity that is suggestive of delirium, assessment of delirium by a healthcare professional trained and competent in the use of a delirium screening tool is recommended.⁶

Despite the frequency of delirium in patients with cancer, factors limiting the diagnosis, and patient characteristics, 30-40% of delirium cases can be prevented.^{19,20} The application of non-pharmacological nursing approaches in patients with cancer is critical for the prevention of delirium.^{5,13} In a meta-analysis study examining the effect of non-pharmacological interventions to reduce the incidence and duration of delirium in critically ill patients, it was reported that multi-component interventions, such as the arrangement of the physical environment, participation of the family in care, exercise support, improvement of cerebral blood flow, and maintenance of current care were the most effective practices for preventing delirium and reducing the length of hospital stay.²¹ Non-pharmacological measures in the management

of delirium are the first line of treatment and should potentially be supported by pharmacological measures if indicated. In pharmacological approaches, drug treatment should be planned according to patient characteristics and the underlying causes.¹⁰ While Dexmedetomidine, one of the pharmacological agents, is recommended for both the treatment and prevention of delirium in the intensive care unit and post-surgical patients, the routine use of antipsychotics is not recommended.^{10,22}

To improve patient outcomes and increase the quality of life in delirium management, strengthening the knowledge and practices of nurses giving care to oncology patients regarding the diagnosis, prevention, and management of delirium comes to the fore. Research shows that the use of an evidenced-based delirium protocol, supported by appropriate education, increases nurses' delirium knowledge, management skills, and self-confidence.^{6,23,24}

This study was conducted to determine the current trends in oncology nurses' diagnosis, prevention, and management practices of delirium. It is anticipated that the results obtained from the study will contribute to carrying out further studies to improve patient care outcomes by identifying delirium diagnosis, prevention, and treatment approaches of nurses working in oncology units and the variables affecting these approaches.

STUDY DESIGN AND METHODS

STUDY DESIGN

This is a cross-sectional study that was carried out by using the snowball sampling method. It was conducted with the participation of nurses working in oncology units (medical oncology, surgical oncology, radiation oncology, radiotherapy unit, outpatient chemotherapy unit) of public and private hospitals in Turkey between May 10 and July 16, 2021. There are seven geographical regions in Turkey. When the status of oncology nurses, who can be reached via e-mail and social media (Facebook, Instagram, WhatsApp), in terms of representing the universe according to these seven regions was examined; it was found that the participation rate was 58% from the Central Anatolia Region, 23.2% from the Marmara Region, 3.9% from the Eastern Anatolia Region, 5% from the Aegean Region, 4.4% from the Black Sea Region, 4.4% from the Mediterranean Region, and 1.1% from the Southeastern Anatolia Region.

The methodological procedures for this study were conducted according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies (See Appendix A).

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SELECTION AND DESCRIPTION OF PARTICIPANTS

The number of nurses working in oncology units in Turkey could not be found; thus, the total number of nurses could not be determined in the study. Consequently, the sample size was calculated using the sampling unknown universe method.²⁵ In this method, in cases where the population is not fully known, the sample is calculated by taking into account the frequency of occurrence of the event (p).²⁵ In a study on evaluating oncology nurses' knowledge about delirium risk factors, assessment, and management, the delirium knowledge level of nurses was 69%.²³ According to this information, when the formula $n = \frac{t^2 \cdot p \cdot q}{d^2}$, where $p = 0.69$ and $q = 0.31$, was used, the sample size of the study was found to be 164.²⁵ A total of 183 oncology nurses were reached during the data collection period determined in the study. Since two nurses did not submit consent, the study was completed with 181 nurses.

The inclusion criteria: Nurses who worked in oncology units, volunteered to participate in the study, and filled out the online questionnaire completely were included in the study.

The exclusion criterion: Nurses who did not work in oncology units and did not agree to participate in the study were not included in the study.

DATA COLLECTION

In this study, an "online questionnaire form" created on Google Forms was used as the data collection tool. Due to the restrictions imposed by the COVID-19 pandemic nationally and globally, the online survey participation link was sent to oncology nurses through social media and communication platforms. Nurses reached by using the snowball method were taken as reference, and other nurses were reached through these nurses. Snowball sampling is used when the actual size of the population cannot be precisely determined. As the number of people reached increases, the sample size also gets larger. It is a fast and easy-to-apply method. The disadvantage of this method is that volunteers with similar characteristics and interest in the subject are included in the sample.²⁶ There is also a risk of bias or skewing of results due to self-selection of responses. Access to the online questionnaire was closed when the data collection phase of the study was completed. Institution and identity information of the nurses participating in the study were not sought. The privacy and security of personal data were protected by using encryption on Google Forms. Only the researchers had access to the data collected from the participants.

The first page of the online survey application was reserved for the consent page. On the consent page, the volunteers were asked whether they agreed to participate in the study, and those who volunteered to participate were allowed to proceed to the next pages, while those who did not submit consent were not allowed to see the questions. The first page

included the identity information of the researchers who carried out this study.

DESCRIPTION OF DATA COLLECTION TOOLS

In this study, two data collection forms, namely, "Oncology Nurse Information Form" and "Oncology Nurses' Practices for the Diagnosis, Prevention, and Management of Delirium", were used.

THE ONCOLOGY NURSE INFORMATION FORM

This form was created by the researchers. It consisted of a total of 10 questions about the nurses' age, gender, marital status, geographical region, total work experience, total work experience in oncology service, the average number of patients given care daily, having an oncology nursing certificate, and having received education on delirium.

ONCOLOGY NURSES' PRACTICES FOR THE DIAGNOSIS, PREVENTION, AND MANAGEMENT OF DELIRIUM

This form was prepared by the researchers according to the relevant literature review and the results of the evidence-level studies and guidelines were used.^{2,5,6,11,13,15,18,19,27} This form included a total of 18 questions where oncology nurses could reveal their practices regarding the diagnosis, prevention, and management of delirium. For the content validity of the form, expert opinion was obtained from three faculty members who had conducted studies on delirium. The answers obtained from the experts were analysed according to the Davis Technique and the content validity index, which should be 0.80 and above, was found to be 1.²⁸

The questions regarding the diagnosis of delirium were designed to evaluate nurses' knowledge and practices about routine consciousness levels, the status of monitoring sedation and delirium, identification of delirium, the status of delirium evaluation (use of a scale and frequency of assessment, patient characteristics making it difficult to make a diagnosis), the status of working with a patient diagnosed with delirium in the last month, delirium risk factors, and delirium findings and types. Alternatively, the questions regarding the prevention and management of delirium were designed to evaluate nurses' views on the difficulty of preventing and treating delirium in patients with cancer, their assessment of the effectiveness of non-pharmacological approaches in the prevention and management of delirium (orientation, communication, mobilisation, hydration, nutrition, sleep, providing family support, comforting the patient, monitoring bowel functions, avoiding unnecessary drugs and invasive interventions, informing the family about delirium, managing pain, making environmental arrangements), and assessment of the drugs they used in the pharmacological management of delirium.

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STATISTICAL ANALYSIS

The study data were analysed on the IBM SPSS Statistics Version 20 software package (IBM Corp Armonk, NY). In the evaluation of the data, descriptive statistics of continuous variables were performed. Chi-square/fisher's exact analysis was used to determine the difference between dependent and independent variables. The level of significance was accepted as 0.05.

ETHICAL CONSIDERATION

Approval of the Presidency of the Ankara University Non-Interventional Research Ethics Committee was obtained (Date: April 12, 2021; Issue: 0652; Approval number: 56786525-050.04.04/100854). The consent of the nurses who voluntarily agreed to participate in the study was obtained on the first page of the online questionnaire.

RESULTS

DESCRIPTIVE CHARACTERISTICS OF THE ONCOLOGY NURSES

The mean age of the nurses was 33.18 ± 8.62 years, 91.7% of them were female, and 48.6% had an undergraduate degree in nursing. The total work experience of 49.2% of the nurses was 11 years or above, 56.1% had been working in the oncology unit for 2-10 years, 32.6% had an oncology nurse certificate, and the average number of patients they gave care to daily was 11.06 ± 7.50 people. Only 11% of the nurses had received education on the diagnosis and/or management of delirium (Table 1). Although not tabulated, it was determined that 25.4% of the nurses with oncology nurse certificates had education on delirium and that only 5.1% ($n = 3$) were in the certificate program.

ONCOLOGY NURSES' PRACTICES FOR THE DIAGNOSIS AND TREATMENT OF DELIRIUM

The examination of the nurses' practices for the diagnosis and treatment of delirium indicated that 74.6% routinely evaluated the level of consciousness, 56.4% sedation, and 38.1% delirium. While 38.1% of the nurses had difficulty diagnosing delirium, it was determined that the patient groups that they most frequently had difficulty with were patients diagnosed with dementia (84%), hypoactive delirium (79.7%), and those who were sedated (75.4%). It was found that only 5.5% of the nurses used a scale to assess delirium and that 60% of these nurses made an assessment once a day. While 31.5% of the nurses worked with patients diagnosed with delirium in the last month, 40.3% could not determine the delirium type. The delirium type that they diagnosed most was hyperactive delirium (35%), while the delirium type they diagnosed least was hypoactive delirium (10.5%). It was detected that 82.5% of the nurses performed pharmacological interventions in patients diagnosed with delirium as a first

step. Although it is not shown in the table, the majority of the nurses who expressed this had worked with patients diagnosed with delirium in the last month ($p < 0.05$). In addition, it was identified that the most frequently requested pharmacological agent by the physician was haloperidol (35%) (Table 2).

ONCOLOGY NURSES' VIEWS ON THE DIAGNOSIS, PREVENTION, AND MANAGEMENT OF DELIRIUM

Delirium descriptions: The nurses' descriptions of delirium included "blurred consciousness," "impaired mood," "impaired mental abilities," "impaired orientation to person, place, and time," and "agitation". In addition, it was noteworthy that nurses frequently described visible signs, such as "outburst of anger," "aggression," "abnormal behavior," "extreme irritability," and "going insane".

It was determined that nurses were better at describing hyperactive delirium findings, and they were less likely to define hypoactive delirium findings, such as lethargy (48.8%), decreased psychomotor activity (47.7%), and withdrawal (56.1%), as delirium findings (Table 3).

Although not included in the table, the nurses were asked to rate the risk factors of patients with cancer, which are important factors in the diagnosis of delirium, from 1 to 5 (1: the least risky, 5: the riskiest) in terms of the risk of developing delirium. Patient characteristics that nurses considered the riskiest were brain metastasis ($\bar{x} \pm SD = 4.57 \pm 0.80$), long-term hospitalisation ($\bar{x} \pm SD = 4.44 \pm 0.85$), advanced age ($\bar{x} \pm SD = 4.42 \pm 0.77$), use of benzodiazepine-derived drugs ($\bar{x} \pm SD = 4.32 \pm 0.86$), advanced-stage cancer ($\bar{x} \pm SD = 4.30 \pm 0.94$), uncontrollable pain ($\bar{x} \pm SD = 4.24 \pm 0.84$), and high disease severity score ($\bar{x} \pm SD = 4.22 \pm 0.94$).

The non-pharmacological approaches that nurses found most effective in the prevention and management of delirium were the arrangement of the environment (97.8%), informing the family about delirium (97.8%), pain management (97.2%), supporting the sleep-wake cycle (97.2%), providing family support (96.1%), and supporting communication (95%), respectively (Table 3).

While 64.6% of the nurses were self-confident in the management of delirium, 67.4% thought that it was difficult to prevent delirium in patients with cancer and 74% thought it was difficult to treat it (Table 3).

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TABLE 1. DESCRIPTIVE CHARACTERISTICS OF THE ONCOLOGY NURSES

Variables	n	%	
Mean age 33.18 ± 8.62 (21-57)			
Female	166	91.7	
Level of education	Health vocational high school	28	15.5
	Undergraduate (Formal)	88	48.6
	Undergraduate (Distance)	33	18.2
	Graduate	32	17.7
Total work experience in nursing Mean: 11.52 ± 9.02 (1–35) years	0-1 year	32	17.7
	2-10 years	60	33.1
	≥11	89	49.2
Total work experience in the oncology unit Mean: 6.61 ± 5.47 (1–24) years	0-1 year	42	23.3
	2-10 years	101	56.1
	≥11	37	20.6
Number of patients given care daily Mean: 11.06 ± 7.50 Median (2–80)	0-5	65	36.1
	6-10	62	34.4
	11-15	18	10.0
	>16	35	19.4
Having a certificate of oncology nursing	59	32.6	
Educated on diagnosis and/or management of delirium	20	11.0	
The place of education on the diagnosis and/or management of delirium (n:20)	Current institution	11	55.0
	Certificate education program	3	15.0
	Individual research/following the literature	2	10.0
	Congress and/or conference, course programs	4	20.0

TABLE 2. ONCOLOGY NURSES' PRACTICES FOR DELIRIUM DIAGNOSIS AND TREATMENT

Practices for delirium diagnosis and treatment	n	%	
Doing routine monitoring of consciousness level	135	74.6	
Doing routine monitoring of sedation level	102	56.4	
Doing routine monitoring of delirium	69	38.1	
Difficulty in diagnosing delirium	69	38.1	
Difficulty in diagnosing delirium according to patient characteristics (n:69)	Patients with dementia	58	84.0
	Presence of hypoactive delirium	55	79.7
	Sedated patients	52	75.4
	Patients with hearing impairment	51	73.9
	Patients diagnosed with depression	50	72.5
	Intubated patients	49	71.0
	Patients with pain problems	42	60.9
	Patients with visual impairment	42	60.9
	Patients with advanced age	41	59.4
Using a screening tool in delirium assessment*	10	5.5	
The frequency of delirium assessment (n:10)	Once a day	6	60.0
	When needed	2	20.0
	Once per shift	2	20.0
Working with a patient diagnosed with delirium in the last month	57	31.5	
Type of the delirium diagnosed (n:57)	Hyperactive	20	35.0
	Hypoactive	6	10.5
	Mixed type	8	14.0
	Delirium type could not be determined	23	40.3
Priority approach when delirium was diagnosed (n:57)	Pharmacological approach	47	82.5
	Non-pharmacological approach	10	17.5
Pharmacological agent requested by the doctor in delirium management (n:57)	Haloperidol	20	35.0
	Benzodiazepine	17	29.8
	Dexmedetomidine	13	22.8
	Olanzapine	3	5.3
	Propofol	1	1.8
	Other†	3	5.3

* Delirium was evaluated according to Glasgow Coma Scale (1), Confusion Assessment Method-CAM (1), Ramsay Sedation Scale (1), Richmond Agitation Sedation Scale (1), blurred consciousness, disorientation, and presence of hallucinations.

† Other pharmacological agents were not specified.

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TABLE 3. ONCOLOGY NURSES' VIEWS ON DELIRIUM

Views	n	%
Nurses' definition of delirium findings		
Shouting	169	93.8
Apathy	111	61.6
Lethargy	88	48.8
Disruption in thought process	179	99.4
Efforts to get rid of medical devices	172	95.5
Complaining	129	71.6
Withdrawal signs	101	56.1
Increase in psychomotor activity	147	81.6
Decrease in psychomotor activity	86	47.7
Attacking other people	155	86.1
Fluctuations in consciousness levels	176	97.7
Hallucinations	172	95.5
Impaired orientation	178	98.8
Loss of long-term memory	57	31.6
Loss of short-term memory	157	87.2
Opinions on the difficulty of preventing delirium in patients with cancer		
Delirium is easy to prevent.	25	13.8
Delirium is difficult to prevent.	122	67.4
No idea	34	18.8
Non-pharmacological approaches that nurses think are effective in the prevention and management of delirium		
Provision of orientation	162	89.5
Supporting communication	172	95.0
Encouraging the patient for mobilisation	159	87.8
Monitoring/supporting hydration	168	92.8
Maintaining care with as many familiar people as possible	168	92.8
Monitoring/supporting nutrition	164	90.6
Supporting the sleep-wake cycle	176	97.2
Providing family support	174	96.1
Comforting the patient with a calming voice	170	93.9
Monitoring bowel functions	135	74.6
Avoiding unnecessary drug use	170	93.9
Informing the family about delirium	177	97.8
Monitoring bladder functions	139	76.8
Providing pain management	176	97.2
Avoiding unnecessary invasive procedures	167	92.3
Making environmental arrangements	177	97.8
Opinions on the difficulty of treating delirium in a patient with cancer		
Delirium is easy to treat.	23	12.7
Delirium is difficult to treat.	134	74.0
No idea	24	13.3
Self-confidence in delirium management		
Yes	117	64.6

PRACTICES OF ONCOLOGY NURSES FOR THE DIAGNOSIS, PREVENTION, AND MANAGEMENT OF DELIRIUM BY THEIR DESCRIPTIVE CHARACTERISTICS

In the study, factors affecting nurses' routine assessment of consciousness, sedation, and delirium during their monitoring of cancer patients were examined. Accordingly, it was detected that nurses who had an undergraduate degree, worked with patients diagnosed with delirium in the last month, and applied pharmacological treatment first when delirium was diagnosed evaluated the level of consciousness at a higher level ($p < 0.05$) (Table 4). Variables affecting routine sedation monitoring; were total work experience of one year or less, low number of patients given care, not having an oncology nursing certificate, not having difficulty diagnosing delirium, using a measurement tool, working with a patient diagnosed with delirium in the last month, and self-confidence in delirium management ($p < 0.05$) (Table 4). It was found that routine delirium monitoring was performed at a significantly higher level by those who were male, had an undergraduate degree, had a total work experience of 2-10 years, provided care for a lower number of patients, did not have an oncology nursing certificate, did not have difficulty diagnosing delirium and used a measurement tool, worked with patients diagnosed with delirium in the last month, in those who have a positive attitude towards delirium management ($p < 0.05$) (Table 4).

When the factors affecting nurses' opinions regarding the diagnosis, prevention, and treatment of delirium in cancer patients were examined in the study, it was determined that the level of education, total work experience in the profession, the nurse to patient ratio, and the status of having received education on delirium diagnosis and treatment did not have an effect ($p > 0.05$) (Table 5). In the study, nurses without an oncology nurse certificate had significantly higher self-confidence in delirium management ($\chi^2/p: 6.491/0.039$) (Table 5). It was concluded that the education level of uncertified nurses was higher ($p < 0.05$) and the rate of working patients diagnosed with delirium in the last month was higher ($p > 0.05$). Nurses who made routine delirium assessment (26.1%), compared to those who did not (45.5%), had less difficulty in diagnosing delirium, thought that it was easier to prevent and treat delirium, and they were more confident in delirium management ($p < 0.05$) (Table 5). Nurses who worked with a patient diagnosed with delirium in the last month had less difficulty in diagnosing delirium than nurses who did not ($\chi^2/p: 10.276/0.002$) (Table 5). In addition, nurses who used a scale in the assessment of delirium had a significantly higher rate of correctly answering hypoactive delirium findings such as apathy ($\chi^2/p: 6.675/0.036$) and lethargy ($\chi^2/p: 7.258/0.027$) as delirium findings compared to the nurses who did not use a scale.

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TABLE 4. DISTRIBUTION OF ROUTINE DELIRIUM, SEDATION AND CONSCIOUSNESS MONITORING SITUATIONS ACCORDING TO NURSES' DESCRIPTIVE CHARACTERISTICS

Descriptive characteristics	Consciousness (N:125)		Sedation (N:102)		Delirium (N:69)	
	n	%	n	%	n	%
Gender						
Male	14	93.3	12	80	12	80
Female	121	72.9	90	54.2	57	34.3
χ^2/p	3.033/0.120		3.718/0.061		12.160/0.001*	
Level of education						
Health vocational high school	26	19.3	18	17.6	14	20.3
Undergraduate (Formal)	61	45.1	53	52	39	56.5
Undergraduate (Distance)	22	16.3	14	13.7	6	8.7
Graduate	26	19.3	17	16.7	10	14.5
χ^2/p	8.061/0.045*		3.992/0.262		9.130/0.025*	
Total work experience in nursing						
0-1 year	22	16.3	24	23.5	13	18.8
2-10 years	48	35.6	35	34.3	31	44.9
≥ 11	65	48.1	43	42.2	25	36.2
χ^2/p	1.616/0.446		6.957/0.031*		8.549/0.014*	
Number of patients given care daily						
0-5	55	41	42	41.6	33	48.5
6-10	45	33.6	36	35.6	22	32.4
11-15	13	9.7	11	10.9	6	8.8
≥ 16	21	15.7	12	11.9	7	10.3
χ^2/p	7.533/0.057		8.958/0.030*		9.663/0.022*	
Having a certificate of oncology nursing						
Yes	40	26.9	26	25.5	14	20.3
No	95	70.4	76	74.5	55	79.7
χ^2/p	2.128/0.150		5.372/0.025*		7.687/0.006*	
Education on diagnosis and/or management of delirium						
Yes	14	10.4	11	10.8	9	13
No	121	89.6	91	89.2	60	87
χ^2/p	0.249/0.595		0.017/1.000		0.451/0.626	
Difficulty in diagnosing delirium						
Yes	48	35.6	32	31.4	18	26.1
No	87	64.4	70	68.6	51	72.9
χ^2/p	1.483/0.292		4.513/0.045*		6.846/0.012*	
Using a screening tool in delirium assessment						
Yes	9	90	10	100	9	90
No	126	73.7	92	53.8	60	35.1
χ^2/p	1.327/0.456		8.198/0.005*		12.077/0.001*	
Working with a patient diagnosed with delirium in the last month						
Yes	52	91.2	39	68.4	28	49.1
No	83	66.9	63	50.8	41	33.1
χ^2/p	12.157/0.001*		4.926/0.036*		4.269/0.048*	

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TABLE 4. DISTRIBUTION OF ROUTINE DELIRIUM, SEDATION AND CONSCIOUSNESS MONITORING SITUATIONS ACCORDING TO NURSES' DESCRIPTIVE CHARACTERISTICS (CONTINUED)

Descriptive characteristics	Consciousness (N:125)		Sedation (N:102)		Delirium (N:69)	
	n	%	n	%	n	%
Opinions on the difficulty of preventing delirium in patients with cancer						
It is easy.	21	84	13	52	11	44
It is difficult.	90	73.8	74	60.7	51	41.8
No idea	24	70.6	15	44.1	7	20.6
χ^2/p	1.498/0.473		3.180/0.204		5.498/0.064	
Opinions on the difficulty of treating delirium in a patient with cancer						
It is easy.	19	82.6	15	65.2	14	60.9
It is difficult.	98	73.1	75	56	48	35.8
No idea	18	75	12	50	7	29.2
χ^2/p	0.932/0.627		1.137/0.566		6.162/0.046*	
Self-confidence in delirium management						
Yes	91	77.8	76	65	56	47.9
No	44	69.8	26	41.3	13	20.6
χ^2/p	4.132/0.116		10.640/0.005*		13.490/0.001*	
Priority approach when delirium was diagnosed						
Pharmacological approach	44	32.6	31	30.4	23	33.3
Non-pharmacological approach	8	5.9	8	7.8	5	7.2
χ^2/p	12.964/0.002*		5.587/0.061		4.273/0.118	

χ^2 : chi-square test/fisher's exact test. *p < 0.05

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TABLE 5. NURSES' VIEWS ON DIAGNOSING, TREATING AND PREVENTING DELIRIUM IN CANCER PATIENTS ACCORDING TO SOME VARIABLES

Variables	Difficulty diagnosing delirium (N:69)		Self-confidence in delirium management (N:117)		Thinking it's easy to prevent delirium (N:25)		Thinking it's easy to treat delirium (N:23)	
	n	%	n	%	n	%	n	%
Level of education								
Health vocational high school	10	35.7	20	71.4	6	21.4	6	21.4
Undergraduate (Formal)	34	38.6	60	68.2	12	13.6	10	11.4
Undergraduate (Distance)	14	42.4	16	48.5	5	15.2	4	12.1
Graduate	11	34.4	21	65.6	2	6.3	3	9.4
χ^2/p	0.528/0.913		6.156/0.406		5.142/0.526		5.240/0.513	
Total work experience in nursing								
0-1 year	14	43.8	18	56.3	4	12.5	4	12.5
2-10 years	19	31.7	43	71.7	10	16.7	9	15.0
≥ 11	36	40.4	56	62.9	11	12.4	10	11.2
χ^2/p	1.694/0.429		4.874/0.301		2.410/0.661		3.038/0.551	
Number of patients given care daily								
0-5	23	35.4	47	72.3	9	13.8	11	16.9
6-10	27	43.5	38	61.3	6	9.7	7	11.3
11-15	5	27.8	13	72.2	2	11.1	2	11.1
>16	14	40.0	18	51.4	8	22.9	3	8.6
χ^2/p	1.842/0.606		8.603/0.197		3.498/0.744		3.196/0.784	
Having a certificate of oncology nursing								
Yes	24	40.7	31	52.5	5	8.5	8	13.6
No	45	36.9	86	70.5	20	16.4	15	12.3
χ^2/p	0.243/0.628		6.491/0.039*		2.631/0.268		0.740/0.691	
Education on diagnosis and/or management of delirium								
Yes	10	50.0	14	70.0	3	15.0	3	15.0
No	59	36.6	103	64.0	22	13.7	20	12.4
χ^2/p	1.345/0.329		0.373/0.830		0.217/0.897		0.194/0.908	
Routine delirium evaluation								
Doing	18	26.1	56	81.2	11	15.9	14	20.3
Not doing	51	45.5	61	54.5	14	12.5	9	8.0
χ^2/p	6.846/0.012*		13.490/0.001*		5.498/0.064		6.162/0.046*	
Working status with a patient diagnosed with delirium in the last month								
Working	12	21.1	42	73.7	8	14.0	9	15.8
Not working	57	46.0	75	60.5	17	13.7	14	11.3
χ^2/p	10.276/0.002*		3.236/0.198		2.364/0.307		0.827/0.661	

χ^2 : chi-square test/fisher's exact test, Row percentage is taken. *p < 0.05

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DISCUSSION

The incidence of delirium in patients diagnosed with cancer is high, although it varies depending on patient characteristics and the stage of cancer.^{3,4,8} Delirium that is not diagnosed early and cannot be managed effectively is a factor that negatively affects the care and patient outcomes of cancer patients and increases the care burden.^{7,9} There are many risk factors that cause delirium development.⁸ The most common triggering factors for delirium in patients with cancer are high-dose psychotropic drugs, constipation,²⁹ benzodiazepine therapy, hematological malignancy, hearing and vision impairment, sleep disorders,³⁰ dehydration, organic damage to the central nervous system, hypoxia,¹⁵ duration of mechanical ventilation,³¹ being aged ≥ 63 , palliative performance scale score of $\leq 20\%$, brain metastasis, urinary tract infection, sepsis, and hypercalcemia.³² Awareness of these risk factors can help identify individuals who are prone to delirium and prevent delirium by controlling modifiable risk factors in risky patients.³³ In the study, the majority of the nurses described patient characteristics that increased the risk of delirium as brain metastasis, long-term hospitalisation, advanced age, use of benzodiazepine-derived drugs, advanced-stage cancer, uncontrollable pain, and high disease severity score. The delirium risk factors expressed by the nurses were consistent with those in the literature.

With the increase in the incidence of delirium in cancer patients related to the frequency of risk factors, patients can be underdiagnosed.^{7,8} The diagnosis of delirium is missed in 73-76% of patients in palliative care units.^{7,29} This result is mostly due to the lack of routine delirium screening in palliative care patients.²⁹ Low awareness of delirium risks, signs and symptoms have also been shown to be a second important reason for underdiagnosing delirium.³⁴ It was detected that very few of the nurses had education on delirium (11%), but nurses who used a scale for the assessment of delirium (5.5%) defined apathy and lethargy as hypoactive delirium findings more accurately. In addition, it was found that the experience of working with patients diagnosed with delirium increased the level of routine delirium monitoring while reducing difficulty making a diagnosis ($p < 0.05$). It was determined that nearly half of the nurses (49.1%) who had experience working with patients diagnosed with delirium in the past month evaluated delirium routinely. Contrary to this result, in a study, it was found that nurses' experience in critically ill patient care did not reduce the risk of delirium.³⁵ In particular, it was pointed out that professional experience should be supported by delirium training. In a study evaluating the knowledge and practices of oncology nurses in China regarding the care of terminally ill patients; It was determined that nurses' understanding of delirium management was inadequate. This result was attributed to insufficient knowledge and care experience.³⁶ For this reason, it is thought that providing training and supervision for the

service that will support the use of routine screening tools in the early diagnosis of delirium in cancer patients will increase the quality of care.

In patients with cancer, delirium can be confused with conditions such as worsening pain, depression, and anxiety.³⁷ In a study evaluating the knowledge, beliefs, and practices of doctors and nurses about delirium, the factors that hindered delirium assessment were failure to understand delirium conceptually (48%), the similarity between delirium and dementia (41.4%), and the fluctuating course of delirium symptoms (38.1%).¹⁴ In our study, 38.1% of the nurses stated that they had difficulty diagnosing delirium. The patient groups in which they often had difficulty diagnosing delirium included patients who were diagnosed with dementia (84%), were in hypoactive delirium (79.7%), and were sedated (75.4%). It can be surmised that these difficulties in the diagnosis of delirium were due to not knowing which scales would be used for the evaluation of sedation in sedated patients and what the cut-off point would be to evaluate delirium, the inadequacy of education programs on the differences between dementia, depression, and delirium, and a lack of routine screening at regular intervals due to the fluctuating course of delirium findings.^{10,18} It was identified that more than half of the nurses' monitoring of the consciousness and sedation level of the patients, the rates of routine delirium monitoring (38.1%) and use of measurement tools (5.5%) were low. These low rates may have been due to both nurses' inadequate awareness of the issue and the lack of care protocols for delirium diagnosis and management in the institutions where nurses worked. Although no distinction was made in terms of oncology units in the study, it was concluded that as the patient-to-nurse ratio increased, both sedation and delirium monitoring levels decreased significantly ($p < 0.05$).

Delirium monitoring and management can be affected by patient characteristics as well as subject-related awareness of healthcare professionals. In this study, it was found that nurses who were male, had an undergraduate degree in formal education, and had 2-10 years of professional work experience performed a higher level of routine delirium monitoring ($p < 0.05$). Although it was seen in the study that nurses' education level and professional experience affected their delirium monitoring, it was detected that having an oncology nursing certificate (32.6%) and having an education on delirium (11%) did not affect the frequency of routine delirium monitoring. It is thought that this result was affected by the low number of nurses with education on delirium and the fact that only 5.1% of them had received education on delirium in a certificate program. Contrary to this result, in a randomised controlled study, it was determined that the psycho-oncology education program given to oncology nurses, which also included delirium, significantly increased the nurses' self-confidence and knowledge.¹⁶ Certificate programs are important, especially

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in supporting the development of nursing competencies and expertise in the field of oncology nursing. For this reason, it can be said that delirium diagnosis and management should be given more attention in oncology nursing certificate programs.

Delirium in cancer patients is a syndrome that can be prevented with nonpharmacological approaches.^{19,20} However, in the study, it was found that 67.4% of the nurses thought that delirium was difficult to prevent in patients diagnosed with cancer. In a meta-analysis study, it was shown that multi-component non-pharmacological delirium prevention interventions (orientation, early mobilisation, supporting hearing and visual impairments, regulation of sleep-wake cycle, hydration support) reduced the incidence of delirium by 44%.²⁰ In elderly patients hospitalised due to advanced cancer, up to one-third of delirium episodes were prevented through non-pharmacological approaches that supported basic needs, such as physical and cognitive activity, sleep, hydration, vision, and hearing.³³ It was identified that the incidence of delirium decreased from 7.1% to 4.3% with a systematic prevention program for delirium in a hospital that provides special treatment for cancer in Japan.³⁸

The goal in delirium management is; It includes presenting preventive approaches, identifying delirium risk factors and eliminating them if possible, and in the final stage, pharmacological and non-pharmacological management of delirium.³⁹ The use of non-pharmacological approaches is recommended as the first line of treatment in the management of delirium.^{6,18} In the study, it was detected that only 17.5% of the nurses first used a non-pharmacological approach to delirium treatment. In a review study evaluating the pharmacological and non-pharmacological management of delirium in oncology hospitals; It was found that in 80% of the ten studies analysed, delirium was managed with a pharmacological agent and haloperidol was used especially frequently in advanced stage cancer patients.³⁹ In a study evaluating the attitudes, beliefs and opinions of certified palliative care specialists and liaison psychiatrists towards hypoactive delirium in the last days of life; 62% of physicians stated that pharmacological drugs should be used in the management of hypoactive delirium.⁴⁰ In a study evaluating the practices of clinicians regarding delirium treatment in Australia; It has been interpreted that 79% of palliative care providers use antipsychotics in delirium management, and this is mainly due to distress and safety concerns for the patient and others nearby.⁴¹ In this context, the importance of a multidisciplinary team approach in delirium management is seen. It is important that all team members work with evidence-based care protocols in the pharmacological and non-pharmacological management of delirium, as it will affect the incidence of delirium, mortality and morbidity rates.^{6,18}

In addition to non-pharmacological approaches in the management of delirium, the use of pharmacological approaches in line with the current literature may be beneficial for patients. For example, Maeda et al. reported that the evidence-based use of antipsychotics together with non-pharmacological approaches in patients with terminal cancer, who developed delirium, was effective in the management of delirium syndrome and recommended its use.⁴² In the study, it was concluded that the majority of nurses' first approach to the treatment of patients diagnosed with delirium was pharmacological (82.5%). The most commonly used drugs in treatment were haloperidol (35%), benzodiazepine (29.8%), and dexmedetomidine (22.8%), respectively. In the pharmacological treatment of delirium, it is emphasised that haloperidol, atypical antipsychotic, or statin group drugs can be used to manage stress-related symptoms (anxiety, hallucinations, delusions, fear, etc.), but that these drugs do not treat delirium. If antipsychotics are to be used for these conditions, it is recommended to apply them in the smallest doses and for a short time.¹⁰ Although dexmedetomidine has superior properties compared to antipsychotic drugs in the treatment of delirium, the evidence is limited.⁴³ However, there are also studies showing that dexmedetomidine reduces the incidence and duration of delirium.⁴⁴⁻⁴⁶ In cancer patients, especially as the prognosis worsens, the number of medications used may increase. There is a relationship between polypharmacy (>6 drugs) and persistence of delirium.⁴⁷ Therefore, it is very important for the oncology nurse to monitor drug management and patient outcomes in the pharmacological management of delirium together with the team.^{10,18}

STUDY LIMITATION

The study has several limitations. The first of these were difficulties in reaching nurses due to the implementation of the study across the country and the impact of the COVID-19 pandemic on oncology units and nurses. Secondly, research results are limited to the nurses who participated in the sample. Thirdly, whether the nurses used an institutional care protocol for the diagnosis and treatment of delirium in the unit where they worked was not asked in the study. Fourth, the research was completed with volunteer nurses by using the snowball method. Nurses who participated in the study voluntarily may have been more interested in the subject than those who decided not to participate. This may have led to selection/non-response bias.

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CONCLUSION

While approximately one third of the nurses participating in the study had worked with patients diagnosed with delirium in the last month, it was found that routine delirium screening and the use of diagnostic scales were low. Additionally, the delirium identification rate of those who had education on delirium diagnosis and management was low. It is recommended that nurses should be supported with in-service/institutional training for developing their delirium diagnosis and management knowledge and skills.

Approximately one-third of the nurses in the study had an oncology nursing certificate. However, the rate of delirium identification for those nurses who had received education on delirium within the certificate program was quite low. It was detected that having an oncology nursing certificate did not make a significant difference in affecting nurses' self-confidence in the routine monitoring and management of delirium. It may be recommended that more education on delirium should be included, especially in these certificate programs, to increase oncology nurses' competency.

In the study, it was determined that being male, having a formal undergraduate degree, professional work experience, a decrease in the number of patients given care, using a screening tool, experience working with patients diagnosed with delirium, and positive views on delirium treatment had a significant impact on nurses' routine delirium monitoring. It is recommended to establish and implement evidence-based care procedures for routine monitoring, early diagnosis, and effective management of delirium in oncology units. In addition, nurses' delirium diagnosis, prevention, and management skills can be increased by planning the workforce according to patient/nurse ratios in oncology units.

In the study, it was determined that nurses who routinely monitored delirium had higher self-confidence in diagnosing and managing it. While almost half of the nurses who had experience working with patients diagnosed with delirium could not determine the type of delirium, it was found that those who used a scale in diagnosis were able to identify apathy and lethargy among hypoactive delirium findings at a higher rate. In addition, it was determined that those who worked with patients diagnosed with delirium had less difficulty diagnosing it. Based on this information, it can be recommended to support the education of oncology nurses using scenario-based case examples to increase their skills in making a correct diagnosis of delirium/differentiating delirium types. The study showed that although more than half of the nurses had self-confidence in delirium management, they thought it was difficult to prevent and treat it in patients with cancer. It was concluded that the majority of nurses managed delirium with pharmacological approaches.

IMPLICATIONS FOR RESEARCH, POLICY, AND PRACTICE

The level of education, experience, patient-to-nurse ratio, and positive attitudes towards delirium were found to be effective in routinely monitoring of delirium in patients diagnosed with cancer, using a valid and reliable screening tool, and managing delirium by oncology nurses. Consequently, it was identified that it was important to support the education of oncology nurses by using case examples in in-service or certificate programs and to prepare and implement evidence-based care procedures/algorithms for delirium monitoring, prevention, and treatment. In addition, it is important to start education on delirium at the undergraduate level in order to increase delirium awareness after graduation. It is thought that workforce planning in oncology units according to patient/nurse ratios will improve nurses' delirium diagnosis and management skills. Multidisciplinary collaboration between professionals such as physicians, nurses, physiotherapists and psychiatrists is important in delirium management. For this reason, it is recommended that maintenance procedures be organised in a way that prioritises team cooperation.

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VTE prophylaxis for major abdominal surgery: A hospital audit and nurses' survey for quality improvement

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ABSTRACT

Objective: The objective of this study is to assess and improve VTE prophylaxis practices in major abdominal surgery through a hospital audit and nurses' survey.

Primary aims: Evaluate adherence to VTE prophylaxis guidelines in abdominal surgery, identify improvement opportunities in VTE prevention and assess the effectiveness of current prophylactic measures.

Nurses' survey: Evaluate surgical nurses' knowledge and implementation of VTE prophylaxis and identify educational gaps to improve VTE prevention.

Secondary aims: Integrate audit and survey insights: Gain insight into VTE management practices, to develop quality improvement programs for better prophylaxis and outcomes.

Background: Guidelines for the prevention of venous thromboembolism (VTE) in surgical patients involve risk assessment, followed by chemical and mechanical prophylaxis. Often, VTE risk assessments are not completed which leads to inappropriate or inadequate prophylaxis. The current guidelines suggest that a healthcare provider, such as a nurse or physician, should conduct the VTE risk assessment for each patient.

Study design and methods: Initially, a prospective audit was conducted to examine VTE prophylaxis practices at a tertiary hospital. This VTE audit was conducted alongside a nurses' survey to assess current VTE prophylaxis practices. Both measures were taken to review the quality of care provided to surgical patients.

Results: The practice of VTE prophylaxis shows high utilisation of all three prophylactic modalities but a lack of risk assessment documentation in the medical records. Nurses, although perceiving it as their responsibility, do not conduct assessments for venous thromboembolism risk.

Conclusion: Based on the audit and survey results, the hospital has not fully adopted the guidelines for venous thromboembolism prophylaxis in major abdominal surgery cases. There is a lack of proper risk assessment documentation, and nurses are not consistently engaged in conducting these.

Implications for research, policy, and practice: This paper presents valuable insights into the current prescribing practices for VTE prophylaxis after major abdominal surgery, as gleaned from a clinical audit and a survey of nurses. The hospital audit indicates that overall, all three are being used, instead of

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two. While this approach does not contravene current guidelines, the use of both stockings and compression devices is not needed, instead adding new risks, unnecessary nursing workload and financial cost to health services. Further, this approach may prolong recovery with patients unable to mobilise while wearing compression devices to take part in rehabilitation programs.

What this paper adds:

- This paper adds to the existing literature by highlighting the gap between recommended guidelines and the actual implementation of VTE prophylaxis practices in the context of major abdominal surgery.
- These results provide meaningful clinical relevance about VTE prophylaxis practice for nurses and surgeons involved major abdominal surgery.
- The continuing education of Australian nurses should include an emphasis on VTE risk assessment and prevention.

Keywords: Venous thromboembolism (VTE), Deep vein thrombosis (DVT), Pulmonary Embolism (PE), VTE prophylaxis

List of abbreviations

DVT	Deep Vein Thrombosis
GCS	Graduated Compression Stockings
IPCD	Intermittent Pneumatic Compression Devices
JHH	John Hunter Hospital
LMWH	Low Molecular Weight Heparin
PE	Pulmonary Embolism
RACS	Royal Australasian College of Surgeons
RCT	Randomised Controlled Trial
REDCap	Research Electronic Data Capture
VTE	Venous Thromboembolism

INTRODUCTION

Conducting a venous thromboembolism (VTE) hospital audit and a nurses' survey at the same hospital can provide a comprehensive approach to understanding and improving the management of VTE in the healthcare setting. Both methods serve different purposes and together offer valuable insights into different aspects of VTE prevention and care.

The VTE hospital audit involves a systematic review and assessment of the hospital's practices, protocols, and outcomes related to VTE prevention, diagnosis, and treatment. The primary objectives of this audit was to evaluate the hospital's adherence to clinical guidelines, identify potential areas for improvement, and assess the effectiveness of existing VTE prevention measures. The audit includes data on risk assessment practices, appropriate use of prophylactic measures, and adherence to treatment guidelines.

The nurses' survey focused on gathering feedback from healthcare providers directly involved in patient care. In the context of VTE, nurses play a crucial role in risk assessment, preventive measures, patient education, and monitoring. Their perspectives and experiences can offer unique insights into the challenges and barriers faced during the implementation of VTE prevention strategies.

By conducting both a hospital audit and a nurses' survey, healthcare organisations can gain a comprehensive understanding of the entire VTE prevention process. The hospital audit provides objective data and performance metrics, while the nurses' survey offers subjective insights

and real-world experiences. Integrating these two approaches allows for a more holistic assessment of VTE management, facilitating targeted interventions and quality improvement strategies.

Ultimately, the goal of this combined approach is to enhance patient safety, reduce VTE incidence, and improve patient outcomes through evidence-based practices and effective implementation at all levels of the healthcare system.

BACKGROUND

Major abdominal surgery patients are at greater risk of developing VTE.¹ There are two types of prophylaxis for VTE: chemical prophylaxis and mechanical prophylaxis. Traditionally, chemical prophylaxis has been performed by administering low molecular weight heparin (LMWH) as well as mechanical prophylaxis using graduated compression stockings and/or intermittent pneumatic compression devices. Despite this, the risk of VTE should always be assessed first and continually reviewed throughout the surgical journey for a patient.

There have been several randomised controlled trials (RCTs) that have demonstrated the efficacy of thromboprophylaxis in reducing VTE incidence.²⁻¹⁵ It is paramount to balance the risks associated with excessive bleeding in surgical patients when administering VTE prophylaxis. The Apollo Trial represents one of the most promising studies on surgical patients with VTE prophylaxis.¹⁵ A low rate of major bleeding was observed when chemical prophylaxis was combined with mechanical prophylaxis.

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The Royal Australasian College of Surgeons recommends that for major abdominal surgery, anticoagulant prophylaxis in the form of heparin or low-molecular-weight heparin (LMWH) should be administered.⁶ In addition, mechanical prophylaxis should be used in the form of graduated compression stockings (GCS) and/or intermittent pneumatic compression devices (IPCDs).

The Australian Commission on Safety and Quality in Health Care recent VTE guidelines support nurses requiring an awareness of the importance of VTE risk assessment and prophylaxis.⁸ Nurses play a critical role in the prevention and management of venous thromboembolism in hospitalised patients, including those undergoing major abdominal surgery. As frontline healthcare providers, nurses are responsible for identifying patients at risk of VTE and implementing appropriate prophylactic measures. They also monitor patients for signs and symptoms of VTE, assess the effectiveness of prophylactic measures, and provide patient education about VTE prevention and management. Given the high incidence of VTE in hospitalised patients, it is essential that nurses are actively involved in VTE risk assessment and prophylaxis to ensure optimal patient outcomes.

Incorporating nurses' input and feedback through surveys can also help identify areas of improvement and inform the development of effective VTE staff education strategies and prevention strategies. An Australian study demonstrated that VTE compliance within a metropolitan Australian hospital increased dramatically from 27% to 85% over a 5-year period.¹⁶ This was a direct result of evidence-based education sessions aimed at improving nurse knowledge and empowering nurses to take responsibility for undertaking VTE risk assessments.

This hospital audit and survey assessed VTE prophylaxis practices in patients undergoing major abdominal surgery at a tertiary hospital. The audit aimed to evaluate the documentation, risk assessment, and utilisation of VTE prophylaxis practices and compare them to established VTE guidelines. The survey aimed to assess nurses' knowledge, attitudes, and practices regarding VTE prophylaxis. The data from both measures were analysed to identify areas for improvement in VTE prophylaxis practices and to develop targeted interventions aimed at enhancing the quality of care provided to patients.

METHODS

This study aimed to examine VTE prophylaxis practices in patients undergoing major abdominal surgery at a tertiary referral hospital. Two measures were taken to assess the quality of care provided to these patients: a prospective audit and a nurses' survey from January until August 2023. The hospital audit and nurses survey protocol were approved by the Hunter New England Regional Ethics Review Board (Reference number 2018/ETH00331 and AU202301-07). All

patient data was kept confidential and anonymous. The nurses who participated in the survey did so voluntarily and provided their informed consent.

The prospective audit was conducted on 100 consecutive patients who underwent abdominal surgery at a tertiary referral hospital. Data were collected on VTE prophylaxis documentation, risk assessment, and utilisation and compared to established VTE guidelines. Over a 4-week period, patients aged >40 years undergoing elective major abdominal surgery were screened for eligibility. The audit checklist was completed twice daily, with patient bedside observation and medical record review for the first three postoperative days (Supplementary 1). The checklist included VTE risk assessment documentation, as well as chemical and mechanical prophylaxes prescription and documentation.

In addition to the audit, a nurses' survey was conducted at the hospital to assess current VTE prophylaxis practices (Supplementary 2). All nursing staff on seven surgical wards caring for patients undergoing major abdominal surgery received the survey. The survey questions were designed to gather information on a nurse's knowledge, attitudes, and practices regarding VTE prophylaxis. Data from the audit and the survey were analysed to identify areas for improvement in VTE prophylaxis practices. The findings will be used to inform the development of targeted interventions to improve the quality of care provided to patients undergoing major abdominal surgery.

RESULTS

The hospital audit revealed that 99% of patients had an incomplete risk assessment form in their medical record. Despite this, 98% of patients received chemical prophylaxis (LMWH for all). There was wide variation between patients regarding combination prophylaxis, with 94% receiving all three modalities (LMWH, GCS, and IPCDs), instead of the 2/3 recommended by the current RACS guidelines.⁶ Of this 94%, 94% were ambulant within 24 hours postoperatively (Table 1).

The nurse's survey received a 43% (138/317) response rate, with registered nurses being more likely to respond (Table 2); 11% had VTE education in the past five years, and 14% had read the Hunter New England Local Health District (HNELHD) policy compliance procedure for *Prevention of Venous Thromboembolism (VTE) – Adult PD2019_057: PCP*⁶ (Table 3).

Despite this, most nurses believed that their knowledge about VTE risk assessment was good, which was reflected in their ability to correctly answer questions about risk factors, with an 85% correct response rate. Interestingly, 63% of the respondents believed that nurses were responsible for completing the VTE risk assessment, while 16% thought that both the medical officer and the nurse should do it, and only 9% believed that the pharmacist should be involved. Less than half of the nurses rated their knowledge about

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TABLE 1. MAJOR ABDOMINAL SURGERY VTE AUDIT BY PROCEDURE TYPE

	Lower GI surgery N	Upper GI surgery N	Gynaecology Surgery N	Urological Surgery N	Combined surgery N
Total in each group	26	17	45	12	100
VTE risk assessment score					
VTE risk assessment completed (Yes)	1	0	0	0	1/100
Prophylaxis in OT					
IPCDs in OT	26	17	42	12	97
GCS in OT	26	17	45	12	100
VTE prophylaxis applied post OT					
IPCDs, LMWH, GCS	24	15	43	12	94
LMWH +GCS	2	1	1	0	4
IPCDs + GCS	0	0	2	0	2
LMWH alone	0	0	0	0	0

GI, gastrointestinal; VTE, venous thromboembolism; OT, operating theatre; GCS, graduated compression stockings; IPCDs, intermittent pneumatic compression devices; LMWH, Low Molecular Weight Heparin

TABLE 2. NURSE DEMOGRAPHICS

Current position	N	Experience	
		No. years	n
Nurse Unit Manager	4	11–12	2
		>20	2
Clinical Nurse Consultant	7	11–12	3
		>20	4
Clinical Nurse Specialist	29	<5	2
		6–10	11
		11–12	8
		>20	8
Clinical Nurse Educator	1	6–10yrs	1
Registered Nurse	91	<5	37
		6–10	22
		11–12	12
		>20	19
Enrolled Nurse	5	<5	2
		6–10	0
		11–12	1
		>20	2
Assistant in Nursing	1	<5	1

TABLE 3. VTE EDUCATION

Current position	N	Have had VTE education in the past 5 years	Have read the VTE policy
Nurse Unit Manager	4	1	2
Clinical Nurse Consultant	7	1	3
Clinical Nurse Specialist	29	14	13
Clinical Nurse Educator	1	0	1
Registered Nurse	91	43	25
Enrolled Nurse	5	1	1
Assistant in Nursing	1	0	0

VTE, Venous thromboembolism

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VTE prevention as good, indicating a potential need for further education and training. Especially when only 14% had training on how to apply graduated compression stockings and 28% knew how to use intermittent pneumatic compression devices. The survey results showed that only 13% of the nurses surveyed provided a correct answer when asked what type of prophylaxis should be prescribed for an ambulant patient following major abdominal surgery, while 65% of the respondents recommended the use of all three forms of prophylaxis (chemical, GCS, and IPCDs). The major concerns for using compression stockings and IPCDs were skin injury, expense, uncomfortable for the patient, the hospital not having all sizes available, and concerns that IPCDs were a falls risk.

VTE risk assessment plays a pivotal role in the comprehensive care of surgical patients, underscoring its crucial importance for nurses. As frontline caregivers, nurses are uniquely positioned to identify and assess patients' risk factors for venous thromboembolism, a potentially life-threatening condition. Surgical nurses were requested to assess the significance of VTE risk assessment. Figure 1 illustrates data from this hospital, indicating that 98 percent of nurses view VTE risk assessment as ranging from important to very important.

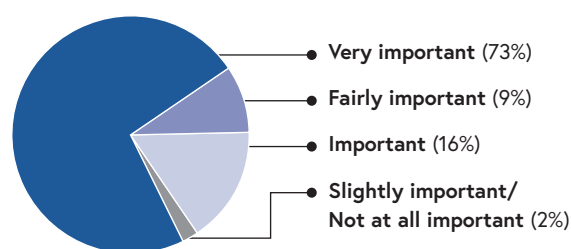


FIGURE 1. NURSES RANKING OF THE IMPORTANCE VTE RISK ASSESSMENT

Through diligent risk assessment, nurses can tailor VTE prophylaxis strategies to individual patient needs, optimising the balance between preventing thrombotic events and minimising bleeding risks. By actively engaging in risk assessment, nurses contribute to improved patient outcomes, reduced complications, and enhanced patient safety. Furthermore, their involvement ensures a collaborative approach to care, fostering interdisciplinary communication and alignment with evidence-based guidelines. Ultimately, VTE risk assessment empowers nurses to deliver patient-centred care and underscores their integral role in the multidisciplinary effort to prevent and manage thromboembolic complications.

DISCUSSION

This research highlights several interesting factors regarding VTE prevention following major abdominal surgery. The most striking factor is the limited regard by surgeons and clinical staff for risk stratification based on patient factors.

The second is the uniform use of chemical prophylaxis but limited post-discharge prescription of this. The third is the high rate of dual mechanical prophylaxis and lastly registered nurses do not play a role in VTE risk assessment.

These results provide meaningful clinical relevance about VTE prophylaxis prescribing practices for nurses and surgeons involved in major abdominal surgery. This audit indicated that, overall, all three prophylactic measures are being used, instead of only two of the three. The rate of using all three prophylactic measures suggests a disparity between the process of evaluating risk levels and the subsequent prescription of prophylactic measures. It appears that routine adoption of all three prophylactic measures has become commonplace, despite no research evidence demonstrating additional benefit from using both mechanical methods (GCS and IPCD) over a singular method of mechanical prophylaxis to avoid VTE. The potential for chemical prophylaxis combined with a single form of mechanical prophylaxis to adequately avoid VTE after abdominal surgery is demonstrated by recommendations in state and hospital guidelines.

The audit identified that risk assessment tools are infrequently utilised by nursing or medical staff, despite surgeons being cognisant of the appropriate risk factors for VTE following surgery. In addition, only 1% of the VTE risk assessment forms were completed in the audit. This finding is in stark contrast to The Australian Commission on Safety and Quality in Health Care recommendations for VTE prevention. Their first quality statement suggests that risk assessment is paramount. They recommend that a patient potentially at risk of VTE (as determined by a local hospital/unit policy) receives a timely assessment of VTE risk using a locally endorsed evidence-based tool to determine their need for VTE prevention. The result should be documented at the time of the assessment, in a place that is easily accessible to all clinicians involved in the patient's care.

Interestingly, bedside registered nurses, although a key group for VTE prevention, are not included as part of the VTE risk assessment practice at this tertiary hospital. Nurses are on the frontline of thrombosis prevention and play an important role in reducing the burden of VTE. Nurses are accountable for administering pharmacologic measures including both oral and injectable medications. The nurse also has an active role in the implementation of mechanical prophylaxis methods. They are required to check skin integrity regularly each day when using GCS and IPCDs. Communication between surgeons and nurses has broadened. Nurses take part in daily rounds and have more input on patient care decision-making. Nurses and medical officers need to work together to take responsibility and be accountable for the patient's protection against VTE.

By nurses playing an essential role in VTE risk assessment, applying timely preventive methods, and providing vital education for VTE prevention, skilled nursing intervention

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can save lives. The NSW Health policy states that nursing staff/midwives are to be aware of VTE risk and assist in ensuring the processes for prevention are implemented. It is important for all nurses, during a patient's hospitalisation and upon discharge, to be aware of guidelines and educate patients and medical staff of the same. Despite this policy emphasis on VTE risk assessment in all hospitalised patients, there remains a gap between current, evidence-based recommendations for VTE prevention and reported nursing practices.

The high rate of using both forms of mechanical prophylaxis is intriguing. The internal audit of surgical practice at our institution (JHH) highlighted this. We found the rate of using all three prophylactic measures to be 94% following major abdominal surgery (n=100). These rates indicate that the routine adoption of all three prophylactic measures has become commonplace, despite no evidence demonstrating additional benefit from employing both mechanical methods (GCS and IPCD) over a singular method of mechanical prophylaxis to avoid VTE.

There is a need for system-wide interventions, such as education, alerts, and multifaceted interventions to effectively improve the prescribing of thromboprophylaxis. It is important for facilities to monitor VTE prevention processes and cases of VTE to improve outcomes. Data collected should be regularly passed on to clinicians and nurses to raise VTE awareness and used to drive change through quality improvement initiatives.

CONCLUSION

There remains a gap between current, evidence-based recommendations for VTE prevention and reported practices. The hospital audit found that guidelines for major abdominal surgery have not been adopted. It appears that risk assessment tools are rarely used as a guide for VTE prophylaxis. Despite this chemical prophylaxis is uniformly prescribed and the use of both forms of mechanical prophylaxis is routine. Mechanical measures can be nurse initiated but are not. Nurses have the potential to change the culture and improve outcomes for surgical patients.

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Nephrology nurse practitioner model of care for chronic kidney disease: Lessons learned and informing future healthcare delivery

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ABSTRACT

Background: Chronic kidney disease (CKD) affects more than 10% of the Australian adult population. It is a progressive disease that involves multiple physiological systems and is associated with several comorbid conditions, making it particularly burdensome on patients and the healthcare system. Alternative models of healthcare delivery are required to slow the progression to kidney failure.

Aim: To describe the characteristics, patient profiles, and health outcomes of patients with CKD attending a nephrology nurse practitioner-led clinic.

Design: Longitudinal health-service exploratory design.

Methods: Following ethics approval, data were extracted from a chronic kidney disease registry for all consenting patients who attended a nephrology nurse practitioner-led clinic. Data were analysed descriptively.

Results: Over the study period, 253 patients (122 male and 131 female) attended the clinic. The mean age was 70.27 ± 10.48 years, and at baseline most had either chronic kidney disease grade 3A (32.8%) or 3B (41.5%). For the majority of those who remained in the clinic, kidney function remained stable or slightly improved.

A large proportion were within recommended target ranges for systolic (85.6%) and diastolic (98%) blood pressure although many had high BMI (mean 31.99 ± 6.47) and HbA1c (57.1%).

Conclusion: The nephrology nurse practitioner-led clinic demonstrated effectiveness in addressing CKD targets for patients and provides an opportunity to transform traditional primary and specialist healthcare delivery.

Keywords: Advanced practice nursing, CKD, nephrology, Nurse Practitioner, renal

What is already known about the topic?

- Early intervention in chronic kidney disease (CKD) can slow or halt the progression of the disease, reducing long-term burden and healthcare costs.
- An integrated model of care including primary and specialist providers is considered optimal for the early detection and treatment of CKD.
- An integrated nephrology nurse practitioner model is an emerging model of care for CKD patients. However, studies investigating the cost-effectiveness, efficacy, and characteristics of this model compared to specialist or primary care in Australia are lacking.

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What this paper adds:

- This paper describes the characteristics and outcomes of a nephrology nurse practitioner-led outpatient clinic embedded within a multidisciplinary model of care.
- The majority of patients who remained in nephrology nurse practitioner care maintained recommended CKD targets.
- The findings provide evidence that nephrology nurse practitioners are able to manage patients with less advanced CKD grades who have comorbid conditions and other health risk-factors.

INTRODUCTION

Chronic diseases are persisting conditions requiring long-term healthcare. They affect people of all age groups and account for at least 75% of all global deaths.¹ Chronic kidney disease (CKD) has seen an increase in mortality of 41.5% from 1990 to 2017.² In Australia, one in three adults are at risk of developing CKD and more than 10% already have CKD.³ This disease is predominantly due to diabetes, hypertension, and cardiovascular disease in an ageing population; >44% of Australians over 75 years old have CKD.⁴ In addition, First Nations people are 20 times more likely to develop CKD than non-Aboriginal or Torres Strait Islander people.^{3,5} CKD is graded (G) on the level of estimated glomerular filtration rate (eGFR) from G1 (evidence of albuminuria from urinalysis) to G5 (kidney failure, previously termed end-stage kidney disease). Most cases of CKD are G3 where there is significant irreversible but manageable damage to kidney function.⁶ CKD G3A and G3B are often asymptomatic and frequently underdiagnosed.⁷

Early intervention in CKD is required to slow or halt progression to kidney failure, and an integrated approach to healthcare between primary and specialist providers is considered optimal for the early detection and treatment of CKD.⁸ Current clinical guidelines recommend early identification and regular management to reduce cardiovascular risk and to slow the progression of CKD.^{9,10} If CKD is detected early and managed appropriately, then the otherwise inevitable deterioration in kidney function can be reduced by 50% and, in some cases, reversed. Management of CKD is directed towards multiple clinical targets, such as using Angiotensin Converting Enzyme Inhibitors/Angiotensin Receptor Blockers (ACEi/ARB), achieving blood pressure (BP) targets, and controlling blood glucose levels as well as lifestyle modifications.^{9,10}

In Australia, treatment by a specialty kidney care team is triggered at eGFR below 30ml/min/1.73m² (CKD G4).¹¹ However, CKD G3 is a critical period for care in terms of managing risk factors and slowing disease progression. Traditionally, general practitioners have been tasked with this role, although many people are referred to kidney care services. This is where a specialist nephrology nurse practitioner (NNP) role is used in either primary care or

outpatient clinics. These nurses have extensive knowledge, experience, and qualifications in nephrology, and spend most of their time providing direct patient care.¹²

Internationally, the nurse practitioner role first began in America in the 1960s and has subsequently been adopted in numerous countries across the world.¹³ Nurse practitioners are advanced practice nurses who typically have an expanded scope of practice, such as undertaking comprehensive health assessments, instigating diagnostic investigations, planning and implementing a complete episode of care (including prescribing medication) and, in some countries, conducting admission and discharge of patients.¹⁴ Nurse practitioner-led services are found in hospital wards, outpatient departments, community healthcare centres, primary care (e.g. alongside general practitioners), as well as through private practice. These models of service delivery are seen as an alternative to medical practitioner services, particularly for managing chronic diseases.¹⁵ Several studies evaluating nurse practitioner roles have found that they provide high-quality care, enhance patient satisfaction, and reduce hospital admissions and re-admission rates for people with chronic diseases.^{15,16}

In Australia, a nurse practitioner must hold a Masters level qualification (typically a specialised Master of Nurse Practitioner 2-year degree) and endorsement to extend the traditional nursing scope of practice to that of an advanced level. One of the key differences between nurse practitioners in the United Kingdom is that nurse practitioners in Australia have title protection, meaning that all nurse practitioners are registered by the Australian Health Practitioner Regulation Agency rather than holding the title of a post.¹⁷ The extended scope of practice afforded to nurse practitioners enables them to provide a complete episode of care, such as ordering and interpreting diagnostic investigations (e.g. pathology), making a diagnosis, referring patients to other health professionals (e.g. specialist medical practitioners), prescribing medications, admitting/discharging patients, and undertaking advanced clinical procedures such as intubation and central line insertions.^{18,19} As of 2023, there were 2,656 nurse practitioners registered with the Nursing and Midwifery Board of Australia (NMBA) across a range of primary, secondary, and tertiary healthcare settings, including specialty services such as neonatal intensive care, emergency departments, mental health, and kidney care.²⁰

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In kidney care, NNPs provide care for people with early CKD (in primary care or hospital-based outpatient services) or kidney failure (either in dialysis units or providing conservative care for those people who opt not to have kidney replacement therapy). Across Queensland NNP-led CKD outpatient clinics have been established for over 10 years, and these clinics manage patients with CKD grades 2 to 5 (eGFR 12–85mls/min/1.73m²). The role of the nurse practitioner is to undertake comprehensive clinical assessments of patients, order and interpret pathology results, and manage CKD targets (e.g., BP, glycaemia, cholesterol) through pharmacological (prescribing/titrating medication) and non-pharmacological (diet, smoking cessation, exercise, sleep) management. They also provide education, support patients (and their informal carers) to engage in self-management, as well as support them to make informed health-care related decisions.^{18,21} An additional role is outreach from hospitals into primary care practices to educate general practitioners and practice nurses to ensure diagnosis and early intervention, and timely referral to a nephrologist.

When NNPs are used to manage patients with CKD G2–4, there is evidence of improved patient outcomes, increased uptake of lifestyle modifications, medication adherence, and better glycaemic and BP control.²² A randomised control trial conducted in the Netherlands (MASTERPLAN) found that additional patient support provided by NNPs attenuated the decline of kidney function and improved renal outcomes (measured as death and progression to kidney failure).²³ These studies suggest that NNPs having active roles in a CKD multidisciplinary team within a primary care or hospital setting produce environments of efficient, high-quality care for patients with CKD. One reason for the positive outcomes seen in nurse practitioner services may be that a major focus is the provision of patient education and patient-centred care.¹² General practitioners and medical specialists have frequently been criticised for suboptimal outcomes. Previous research has shown general practitioners and specialists place significantly less value on information provision and person-centredness,^{24–26} and often have a poor understanding of patients' health-related priorities.^{27,28} There is also some evidence that costs to patients are lower when care is provided by a nurse practitioner compared to a specialist,²⁹ although cost-effectiveness evaluations of the model are lacking.

Despite evidence of the benefits of the inclusion of nurse practitioners into multidisciplinary care, the nurse practitioner workforce is underutilised and research into this model of care is scarce. The nurse practitioner workforce in Australia is irregularly distributed, dependent more on independent state and territory initiatives than on coordinated state or federal service planning.³⁰ Previous studies have cited a lack of organisational support, and a lack of understanding and awareness of the role, requiring nurse practitioners to actively promote and advocate for their positions.³¹

National Australian organisations such as the Australian Nursing and Midwifery Federation, the Australian College of Nurse Practitioners, and the Australian College of Nursing have long been lobbying for changes to the Medicare Benefits Schedule (MBS).³² Increasing MBS item numbers would allow nurse practitioners to work to their full scope of practice. Changes to the MBS would improve the financial viability of employing NNPs in primary care where they could provide a significant benefit by working with general practitioners to access to and improve patient care and to increase early detection of CKD and slow its progression.³³ To add to the current body of knowledge around nurse practitioner models of care in Australia, the aim of this study was to describe the characteristics, patient profiles, and health outcomes of patients with CKD attending a NNP model of care.

METHODS

This study was an examination of health services and used a longitudinal design. The evaluation tracked all patients with CKD who attended a NNP-led clinic over a five-year period. This period was chosen due to consistency of the clinic's operation and quality of data. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines have been used for reporting.³⁴

SETTING

The NNP clinic services one of the most culturally diverse populations in Queensland, Australia, where 22.7% of the local population is born overseas and 19.5% speak a language other than English at home.³⁵ The area has a growing population, high levels of social disadvantage, and an increased burden of chronic disease, especially obesity, diabetes, and cardiovascular disease. The Queensland Health clinic operates at multiple locations across the week from a large acute hospital outpatient clinic and as outreach to two community healthcare centres and a smaller district hospital (50 kms from the large hospital). These locations enabled the service to be closer to patient's homes. It is staffed by one NNP (employed by the acute hospital) who works independently conducting the outpatient clinics although has collaborative arrangements with a nephrologist. When the NNP is on leave, there is no backfill for the position, so the clinics are not scheduled at that time.

Patients are referred by general practitioners to the renal department of the large local hospital, and then triaged by nephrologists. Triage category 1 patients include the most serious cases, and must be seen within one month of referral, triage category 2 must be seen within three months, and triage category 3 must be seen within 12 months.³⁶ Patients triaged to category 3 enter the NNP-led outpatient clinic, where the NNP undertakes a comprehensive health assessment and makes a clinical diagnosis. An individualised care plan is developed to establish person-centred

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behavioural goals and to focus on achieving CKD targets. Assessments include taking a medical and medications history, assessing CKD risk factors (blood pressure; smoking, diet, and other lifestyle factors; lipidaemia, proteinuria, and other biomarkers), and discussing appropriate lifestyle modification. These discussions are undertaken in a non-judgemental environment using motivational interview techniques, and engaging the patient on a regular basis, while assessing their readiness to change. Patients may then be referred by the NNP to a number of services, including the Quit smoking program, dietetics, psychology, social work, occupational therapy, exercise physiology, nephrology, or another nurse practitioner (e.g., diabetes nurse practitioner).

Patient education, coaching, and the promotion of self-management are in place to reinforce treatment adherence. Patients return to the NNP clinic every three to six months, depending on individual need. Patients are reviewed a nephrologist approximately once every one to two years to develop a relationship in case kidney function deteriorates and the patient requires kidney replacement therapy or requires more complex care. Patients are also encouraged to see their primary care provider between appointments. Clinic appointments vary from 45-90 minutes depending on the needs of the patient. Patients attend the NNP clinic until their eGFR remains stable for over 12 months, whereby they are discharged to a general practitioner. Should a patient's condition deteriorate (i.e., a reduction in eGFR $> 5 \text{ mLs/min/1.73m}^2$, progression from micro to macro albuminuria, or the development of another serious medical condition), they are referred back to the nephrologist for ongoing management.

PARTICIPANTS

Adults with an eGFR $> 25 \text{ mLs/min/1.73m}^2$ or those with an eGFR $< 25 \text{ mLs/min/1.73m}^2$ who had chosen a conservative pathway of care (i.e., not receiving dialysis) were referred to the NNP-led clinic. Those with rapidly deteriorating kidney function, acute kidney injury, or a kidney transplant were not eligible for this clinic.

DATA COLLECTION

Retrospective data was obtained from the Chronic Kidney Disease Queensland (CKD.QLD) registry for all patients who attended the NNP clinic, and who had consented to participate in the registry. This registry was established for the purpose of CKD surveillance across 11 public hospitals in Queensland.³⁷ Data obtained from the registry included: demographic data (age, gender, ethnicity), cause of kidney failure, comorbidities, eGFR, body mass index (BMI), BP, albumin-creatinine ratio (ACR), protein-creatinine ratio (PCR), HbA_{1c}, low density lipoprotein, and cholesterol levels. Participants were included into the study as they entered the clinic (i.e., not all participants will be present for the entire study period as many entered at years 2 to 5).

DATA ANALYSIS

Quantitative, de-identified data contained within the CKD.QLD Registry dataset was imported into SPSS version 27 for analysis. Descriptive statistics and frequency distributions were generated to investigate patients' demographic and clinical characteristics. For analysis timepoints were established as: baseline (first recorded appointment); 1-year; 2-years; and 5-years from the first recorded appointment. CKD status was defined as progression (if eGFR decreased by $> 5 \text{ mLs/min/year}$), stable (if eGFR remained within $\pm 5 \text{ mLs/min/year}$) and recovery (if eGFR increased by $> 5 \text{ mLs/min/year}$).³⁷

ETHICAL CONSIDERATIONS

The study obtained ethical approval from all necessary university and hospital Human Research Ethics Committees. Participants entered into the CKD.QLD registry had provided written informed consent for the use of their demographic and health information.

RESULTS

DEMOGRAPHIC CHARACTERISTICS

Over the evaluation period, 253 patients (122 male and 131 female) attended the NNP-led clinic for a mean of 1.69 years (SD = 1.69). Table 1 provides the demographic characteristics of patients on entry to the clinic. Patients' mean age was 70.27 ± 10.48 years. The clinic saw a range of patients with CKD G1 to G5, although most patients presented in CKD G3A (32.8%) or G3B (41.5%). The most common cause of CKD was renovascular disease (31.6%) or diabetes (22.9%). Patients had a mean of 4 ± 2.6 comorbid conditions with the most common comorbidities being hypertension (73.9%), dyslipidaemia (53.9%), heart disease (49.4%) and diabetes (48.9%).

CHRONIC KIDNEY DISEASE PROGRESSION

Due to patient numbers varying at each timepoint, eGFR results were collapsed into three time periods: from baseline to 1-year; 1 to 2 years follow-up; and 2 to 5 years follow-up. One year after entry, eGFR had improved by $\geq 5 \text{ mL/min/1.72min}^2$ in 24.4% of patients, remained stable in 53.6% of patients, or had deteriorated by $\leq 5 \text{ mL/min/1.72min}^2$ in 22% of patients (see Table 2). Over 5-years on average, kidney function remained stable as there was only a small average decrease in eGFR of $-3.33 \text{ mLs/min/1.73m}^2$. No significant changes in risk factors, or deterioration (as measured by the pathology results) were seen during the time patients spent in the clinic.

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TABLE 1: DEMOGRAPHIC INFORMATION ON ENROLMENT INTO THE STUDY (N = 253)

Item		N (%)	Median (IQR)
Gender	Male	122 (48.2)	
	Female	131 (51.8)	
Age	Range	33–94	72 (64.00–78.00)
CKD Grade	Grade 1	10 (4.0)	
	Grade 2	32 (12.6)	
	Grade 3A	83 (32.8)	
	Grade 3B	105 (41.5)	
	Grade 4	21 (8.3)	
	Grade 5	2 (0.8)	
Primary diagnosis	Renovascular	80 (31.6)	
	Diabetic nephropathy	58 (22.9)	
	Other	16 (6.3)	
	Glomerulonephritis	12 (4.7)	
	Unknown	8 (3.2)	
	Genetic renal disease	6 (2.4)	
	Missing	73 (28.9)	
Number of comorbidities	Range	0–11	4 (2.25–6.00)
Type of comorbidities	Other comorbidities	148 (58.5)	
	Hypertension	133 (52.6)	
	Dyslipidaemia	97 (38.3)	
	Heart disease	89 (35.2)	
	Diabetes	88 (34.8)	
	Unknown	73 (28.9)	
BMI	Range	18.3–58.3	31 (27.50–35.90)
Smoking status	Current smoker	31 (12.3)	
	Never smoked	102 (40.3)	
	Ex-smoker	104 (41.1)	
	Unknown	16 (6.3)	

Abbreviations: CKD, chronic kidney disease; BMI, body mass index.

TABLE 2: CHANGES IN KIDNEY FUNCTION (EGFR CHANGES +/- 5ML)

	Baseline to 1 year N = 168	1–2 year follow-up N = 118	2–5 year follow-up N = 40
Increase in eGFR ($\geq 5\text{mL}/\text{min}/1.73\text{m}^2$)	41 (24.4%)	22 (18.6%)	9 (22.5%)
Decrease in eGFR ($\leq 5\text{mL}/\text{min}/1.73\text{m}^2$)	37 (22.0%)	38 (32.2%)	10 (25.0%)
No / small change	90 (53.6%)	58 (49.2%)	21 (52.5%)

Abbreviations: eGFR, estimated glomerular filtration rate.

To determine the factors that predict change in eGFR, binary logistic regression analysis was used. The eGFR results were collated into a binary outcome variable: deterioration (reduction in eGFR of $\geq 5\text{mL}/\text{min}/1.73\text{m}^2$) or no deterioration ($< 5\text{mL}/\text{min}/1.73\text{m}^2$ change reduction or an increase in eGFR). Using demographic characteristics (age, gender, number of comorbidities) to predict change in eGFR, none of these characteristics were associated with whether eGFR deteriorated or not.

CLINICAL TARGETS

The results across the four timepoints for BP, BMI, smoking status, CKD grade, ACR, PCR, HbA1c, low density lipoprotein, and cholesterol are presented in supplementary table 1. Patients were predominantly overweight (30.0%) or obese (59.7%), having an average BMI of 32.14 kg/m². At 1-year after entry to the clinic, those within clinical targets were 60.5% of patients for systolic and 85.1% for diastolic (85.1%) BP, smoking (81.1%), ACR (44.1%), PCR (33.8%), low-density lipoprotein (64.4%), and cholesterol (41.9%). However, very few patients had normal HbA1c (14.2%) or BMI (4.3%). After attending the clinic for 2-years, the number of those achieving clinical targets was similar for systolic (54.1%) and diastolic (91%) BP, smoking (82.1%), ACR (38.5%), PCR (42.3%), and HbA1c (38.2%). Slight improvements were seen in BMI (11.1%), low-density lipoprotein (84%), and cholesterol (68%). After attending the clinic for 5-years, only a few of the same patients remained. Of these, a high proportion of patients remained within target ranges for systolic (58.5%) and diastolic (92.7%) BP, smoking (80.9%), and HbA1c (42.9%). However, many had deteriorated in terms of ACR (25.9%), PCR (26.1%), low-density lipoprotein (50.0%), and cholesterol (28.6%).

DISCUSSION

To provide an overview of a NNP-led model of care, we tracked a group of patients attending an outpatient clinic. Patients predominantly were in CKD G3A and G3B due to renovascular disease or diabetes. This group of patients were mostly overweight or obese, had several other chronic diseases and had well controlled BP although they had suboptimal HbA1c and proteinuria levels. This profile represents a common presentation of patients from socio-economic areas, and who are challenging for primary care practices, requiring specialist kidney care. Regular management by an advanced practice nurse with expertise in nephrology can slow progression to advanced CKD grades. Those patients who had remained for two or more years had stable kidney function, remaining predominantly in G3A and G3B; reflecting that NNP was treating appropriate patients, with those deteriorating being referred to a nephrologist, and those who improved returning to their general practitioner. The focus of the NNP is on slowing progression of CKD, which in turn would delay the need to be managed by a nephrologist and also delay the need for burdensome kidney replacement therapies.

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The NNP was managing patients who were representative of the broader CKD patient population reported by Hoy et al.³⁷ These patients were in less advanced CKD grades, obese, and had high rates of albuminuria or proteinuria. Our findings, along with other studies of NNPs in the Netherlands and Canada, provide an understanding of the benefits of NNPs in managing patients with CKD.³⁸⁻⁴⁰ While research comparing the trajectory of patients in NNP clinics to those in primary care or specialist nephrology care is just emerging,⁴⁰ further research is needed, particularly in under-served populations such as those in rural and remote areas of Australia. With the increase in primary care funding for nurse practitioners by the Australian Federal Government, evaluation of these roles chronic disease management is also needed.

Few studies have examined nephrologist's practice in achieving clinical targets, and in those studies were found inconsistent results regarding disease progression, morbidity, and mortality. For example, a similar sample in a large-scale study investigating a nephrologist model of care found that, at 5-6 years follow-up, half of all patients had progressed to the next CKD grade, with rates of progression of approximately $-4.5 \pm 0.3 \text{ ml/min/1.73m}^2/\text{year}$.⁴¹ Hoy and colleagues analysed all patients enrolled in the CKD.QLD registry ($n = 7,060$) reporting similar changes in eGFR over time, indicating that in Australia NNP-led clinics may be similarly effective as nephrologist clinics in delaying progression of CKD in less severe patients.³⁷ Moreover, James and colleagues in Canada did find that patients with early CKD grades had similar outcomes whether managed by a nurse practitioner or nephrologist.⁴⁰

There is a wide agreement that blood pressure control in CKD reduces both cardiovascular risk and disease progression.^{9,10} Patients remaining in this NNP clinic maintained BP targets, despite the age of patients, comorbidity status, and BMI of those attending the clinic while minimising harm (e.g. falls due to low BP). A large recent study in Canada also found similar findings.⁴⁰ Given the complex nature of this cohort, a key aspect of effective NNP care may be the ability to individualise treatment and consider the risk: benefit ratio in patients rather than simply aiming for blood pressure targets. For instance, avoiding falls risk or complex medication regimens to increase adherence.

In other chronic diseases, cost-benefit analyses have found that nurse practitioner models of care were around 12% less expensive than general practitioner care for a similar volume of service.³⁹ As CKD is increasing globally, alternative non-medical models of care are required to manage those people in earlier stages of disease, to reduce the risk of progression to kidney failure, and meet the burden on healthcare services.^{23,42} The results of our evaluation suggest that in Australia, nurse practitioners may be an ideal way to meet this burden by providing both clinically effective and cost-effective care.

LIMITATIONS

Health service evaluations do have limitations, and the major limitation was the inability to determine why patients left the service which as due to limited funding to undertake this evaluation. Understanding how many were discharged due to improvement or deterioration would greatly enhance our understanding of the benefits of NNP-led clinics. This evaluation reports on only one clinic and was only able to report on data captured by the CKD.QLD registry, which limits the generalisability of these findings. Other factors such as medication adherence were not collected and could have also impacted findings. Nevertheless, few studies report on CKD clinical targets, particularly for those patients being managed primarily by a NNP. Further research is required to better explore the impacts of differing CKD models of care provision and the mediating influences of patient health status, health literacy, and other patient and social factors.

When patients are specifically selected (i.e. triaged) for low risk of CKD progression, NNP-led clinics are more likely to be the most appropriate for this group of patients. These nurses provide a valuable contribution to a multidisciplinary team, working collaboratively with general practitioners, nephrologists, practice nurses and allied healthcare providers. It is important for primary and specialist healthcare services to undertake routine audits to benchmark achievement of CKD targets against national and international standards. Regular patient satisfaction surveys would also be beneficial to substantiate the care that patients with CKD receive.

CONCLUSION

We have reported on patients with moderate CKD being managed by a NNP with limited nephrologist involvement. While the current evaluation cannot draw conclusions as to the healthcare outcomes of patients who left the clinic, it does indicate that nurse practitioners are able to manage patients with less advanced CKD grades who have comorbid conditions and other health risk-factors. These nurses are educated and have developed higher levels of skills and abilities in treatment, pathology interpretation, medication management, patient education, and other factors that impact on disease progression. Further evaluation and reporting of innovative, non-traditional models of CKD healthcare are needed. Additional cross-sectional and cohort studies that compare the treatment provision, health outcomes, and CKD progression of patients attending different service models is necessary to adequately evaluate the benefits and cost-effectiveness of NNP-led models of care.

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Does transition theory matter? A descriptive study of a transition program in Australia based on Duchscher's Stages of Transition Theory and Transition Shock Model

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ABSTRACT

Objective: Explore the impact of transition program policy directives grounded in foundational elements of transition theory.

Background: Within fast-track health service environments nurse leaders remain committed to improving transition programs that support wellbeing and retain new graduate nurses. Duchscher's Stages of Transition Theory and Transition Shock model was the framework chosen by the health service nurse leaders to implement in the clinical environment, however, implementing elements can be problematic without sufficient support and clear policy directives.

Study design and methods: Descriptive study using multiple methods in one major national health service that incorporates a number of private (eight) and public (four) hospitals across Australia. Online surveys were distributed to new graduate nurses at one, five and eleven months into the initial transition year. The survey tool was a synthesised adaptation of the Professional Role Transition Risk Assessment

Instrument and Professional and Graduate Capability Framework. At the end of the transition year telephone interviews were conducted with the Nurse Managers who were responsible for implementing transition programs policies and processes. Resulting data were summarised using descriptive statistics for quantitative data and a thematic analysis for qualitative data.

Results: 158 new graduate nurses returned the online survey and eight Nurse Managers participated in the telephone interviews. As a whole the new graduate registered nurses described feeling accepted during their transition and expressed feeling comfortable when approaching senior staff. They managed challenges of shift work and took time for self-care. The clear majority (88%) of participants reported no plans to leave the profession. Nurse Managers were able, in most clinical areas, to apply transition program policy and directives and enable the implementation of Duchscher's Stages of Transition as the framework for the transition support

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initiatives. Retention of new graduates on their wards at the end of the program was determined to be a positive outcome for Nurse Managers.

Discussion: A carefully structured Graduate Nurse Transition Program founded on sound theoretically grounded ideology alongside integrated policy directives guided the Nurse Managers implementation of Duchscher's Stages of Transition Theory and Transition Shock model into practice. Additionally, a dedicated Graduate Nurse Coordinator role with a manageable ratio of graduate nurses was an important component included in the transition program at each participating hospital as it facilitated support of both graduates and Nurse Managers. These positions should be costed into any Graduate Nurse Transition Program. An interesting finding was the consistency in smaller units that were unable to provide or mobilise preceptors for the required allocated mirrored shifts and it was felt this workload management issue impacted the success of graduate transition nurse programs on those units.

Conclusions: Implementing policy directives grounded in foundational elements of Duchscher's Stages of Transition theory and Transition Shock model delivered consistent experiences for new graduate nurses across one major health service that incorporates a number of hospitals across Australia. Data suggested some practical challenges to program implementation for Nurse Managers, including unit/ward size, staffing, and varying levels of understanding of preceptor roles.

Implications for research, policy, practice: Introducing formal policy directives that are grounded in strong theoretical frameworks of professional role transition, agreed to and funded by

health service nurse leaders are important in guiding a consistent approach across health services in the implementation of evidence-based Graduate Nurse Transition Programs.

Key words: Graduate nurse, newly graduated nurses, stages of transition, transition shock, transition.

What is already known about the topic?

- Duchscher's foundational research on the Stages of Transition theory and Transition Shock model is applied to inform Graduate Nurse Transition Programs on an international level.
- There is a current workforce shortage within Australia and internationally. The importance of retention of newly graduated nurses has become a focus for health care services implementing supportive transition programs to prevent new graduates from leaving the profession in the first year.

What this paper adds

- The inclusion of specific policy directives based on Duchscher's Stages of Transition theory and Transition Shock model provides clear direction to Nurse Managers related to the required implementation steps and time frames to be met during the transition year.
- Additional Graduate Nurse Coordinator positions, with a manageable ratio of New Graduate Registered Nurses (NGRNs), are important supports for both graduates and Nursing Managers to meet policy directives. Additional positions should be costed within transition programs.
- Provides additional evidence that well supported newly graduated nurses are likely to remain within the health service.

INTRODUCTION

This article contributes to the discourse on transitioning New Graduate Registered Nurses (NGRNs) into the healthcare environment. The transition of NGRNs into their professional careers continues to evolve as health services respond to the challenges posed by rapidly changing social, political, and economic environments. Çamveren et al. suggested that NGRN transition programs will remain ineffective in addressing transition shock unless strategies to improve these programs are undertaken.¹ This posed an issue for nurse leaders in a major national health service in Australia, as they consider the best approach to effectively support NGRNs and mitigate difficulties within the initial transition shock period. To attempt to address this issue a project was initiated

that embedded a specific health service policy directive grounded in the theoretical underpinnings of Duchscher's Stages of Transition theory, and Transition Shock model into their health service transition program.² The major national health service incorporates a number of private (eight) and public (four) hospitals located across Australia.

BACKGROUND

In the 1974, Marlene Kramer published her seminal research on the experience of 'reality shock' in new nurses.³ Kramer claimed that this difficult journey into professional practice featured strongly in reasons why nurses leave the profession.³ Five decades later, high turnover of NGRNs remains a significant issue especially with an ageing nursing workforce

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and early retirement.⁴ The COVID-19 pandemic has further exacerbated nurse supply shortfalls subsequently placing a spotlight on the importance of both nurse staffing levels and the preparation of new practitioners for this dynamic and highly tumultuous patient care context.⁵ In this current healthcare climate, retention of competent NGRNs by virtue of a supportive, evidence-based transition program takes on even more importance.⁶

Bakon et al's integrative review highlighted a lack of consensus on key components of transition programs including aims, content and the type of support provided.⁷ It was within this context that the authors chose to design an evidence-based transition program based on the strong theoretical framework offered in Duchscher's Stages of Transition theory and Transition Shock model.^{2,8} To implement this program, health service policy directives related to both process and anticipated outcomes were developed that mirrored the theoretical framework described above.

The aim of the study was to examine the effect of implementing policy directives grounded in evidence-based theory on transition into a major national health services NGRN transition programs.^{2,8} The primary research question was: Can a formal integration of policy directives, grounded in the constructs of Duchscher's Stages of Transition theory and Transition Shock model, enable the delivery of a successful NGRN support program, with success determined by an increase in retention of new nurses in the healthcare system and a positive experience by Nurse Managers (NM) working with this demographic?

METHODS

OUTLINE OF TRANSITION PROGRAM

The program applies foundational elements critical to the successful transition of NGRNs according to Duchscher's Stages of Transition theory and Transition Shock model (see Table 1).

The health service policy directive was developed from these theoretical constructs to ensure staff and preceptors who worked in the health services different hospitals, consistently applied the NGRN foundational transition elements outlined in Table 2. It was equally important that NMs understood these foundational elements when evaluating evolving clinical expectations of NGRNs in their practice areas.

In each clinical area the NM allocated a preceptor for each NGRN. Preceptors were scheduled to work alongside the NGRNs (this is called mirrored shifts) for four to five weeks, followed by the provision of an additional six months of preceptored support, though not necessarily working the same shift.

Each hospital site within the overarching health service

TABLE 1. FOUNDATIONAL ELEMENTS REQUIRED FOR THE SUCCESSFUL TRANSITION OF NGRNS TO PROFESSIONAL PRACTICE

Ideologies applied to the design of the transition program
<p>Newly graduated Registered Nurses:</p> <ul style="list-style-type: none"> • have personal and professional lives characterised by stable and supportive relationships; • are afforded roles and responsibilities commensurate with their stage of transition and respectful of their evolving knowledge and confidence; • receive consistent workplace support and constructive feedback; • are familiar with, and successful enacting evolving expectations around care delivery and skill performance; • are provided opportunities to be supported by, consult and collaborate with experienced nurses about increasingly complex clinical decisions; • are consistently successful in responding appropriately to increasingly complex practice scenarios; • are provided with positive review, reinforcement and reassurance about their progress that is evidenced by a strengthening of their knowledge base; • are supported to influence, improve upon and enact quality care policy related to care and practice standards.

TABLE 2. NATIONAL GRADUATE NURSE TRANSITION PROGRAM KEY POLICY DIRECTIVES

Length of program and contractual arrangements:	
<ul style="list-style-type: none"> • 12-month contract with re-employment option. • Minimum 1,300 hrs. Worked over 52 weeks. 	<ul style="list-style-type: none"> • Maximum two 6-month rotations. • Minimum FTE – 0.8.
<ul style="list-style-type: none"> • Paid attendance at Specific Orientation Program. Minimum 37.5 hours (5 day) program. • Includes 3 days theoretical training; • 2 days supernumerary clinical practice with allocated preceptor. 	<ul style="list-style-type: none"> • No relieving for first 4 weeks. • No night duty for the first 12 weeks. • No 'buddying' with undergraduate students or another new graduate during first 6 months.
Resources and support for success	
<ul style="list-style-type: none"> • Dedicated Graduate Nurse Transition Program Coordinator. 	<ul style="list-style-type: none"> • Minimum 12 months contract • Maximum ratio 1:12 • Facilitator to New Graduate Nurse.
<ul style="list-style-type: none"> • Graduates roster mirrored with preceptors for first 4 to 5 weeks where possible. 	<ul style="list-style-type: none"> • Two preceptors can be used during this time.
<ul style="list-style-type: none"> • Graduates may be rostered to work on the weekends with their preceptor after completing two weeks of first rotation only (does not apply to second rotation). 	<ul style="list-style-type: none"> • If graduates required to go relieving during this period, then only to non-specialty areas. Must be provided with a "relief" preceptor for the shift, and/or buddied with a senior staff member.
Professional Development Study Sessions	
<ul style="list-style-type: none"> • Study Sessions scheduled throughout the program. • In total a minimum of 22.5 hours allocated to this component of the program. 	<ul style="list-style-type: none"> • Consideration given to each session's content to ensure learning needs met, whilst observing the different stages of transition (Duchscher 2008,2009).

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supported the introduction of a new Graduate Nurse Coordinator (GNC) role with a specific ratio of 12 NGRNs. This key role oversaw the policy directive of the implementation of the transition stages within the allocated clinical areas throughout the 12-month program. The GNC role involved recruitment of NGRNs, placement into clinical rotations, the facilitation of regular study sessions, ongoing clinical competency assessments, preceptor guidance and clinical bedside support. The GNC was the primary point of contact for NGRNs, preceptors and NMs as it related to their initial 12 months of transition to professional practice.

The NMs were tasked with identifying potential preceptors and ensuring rostering of preceptors on the same shifts as the NGRNs. NMs were required to complete routine performance appraisals on NGRNs as they would for all nursing team members. The Learning and Development teams at each hospital site provided additional educational support to the NGRNs.

RESEARCH DESIGN

The descriptive study applied two separate methods. Phase One consisted of a survey conducted at one, five, and eleven months with NGRNs. These months were chosen to enable comparisons over the transition year and were practical for the health service to facilitate participant recruitment. Phase Two involved semi-structured interviews with NMs at the end of the 12-month transition program, explored their experience (enablers and barriers) of implementing the transition program based on the policy directives.

PARTICIPANTS

Phase One consisted of two participant cohorts who were in the transition program Group 1 included NGRNs (n=86) from across eight private hospitals and Group 2 included NGRNs (n=39) from across four public hospitals. These hospitals are in different geographical areas across Australia but belonged to one major health care group. Participants in Phase Two were NMs from across the different hospitals who were responsible for operationalising transition supports for NGRNs. Prior to commencement of the research, relevant senior nursing staff and NGRNs were informed about the study, through staff meetings and email, which spanned January 2020-July 2021.

ETHICAL CONSIDERATION

This project received ethics approval from Calvary Health Care Adelaide's Human Research Committee (Ethics Protocol 20-CHREC-E002) and from the University of Adelaide's Human Research Ethics Committee (Ethics Protocol 34389). Ethical consideration was given to ensuring informed consent, confidentiality, secure data management and anonymity of the participants. The right to withdraw from the study without any negative impact on their employment was highlighted.

PHASE ONE: QUANTITATIVE SURVEYS

Using work emails, NGRNs were sent a Participant Information Sheet explaining the study and a link to the online questionnaire in March 2020, August 2020, and February 2021. Data collection for each of the three surveys occurred over two weeks with a weekly email reminder.

Survey Monkey™ was the platform used for data collection. The instruments used to assess the NGRNs experience of transition were: 1) the *Professional Role Transition Tool*, (Appendix A) which was a synthesised adaptation of *Duchscher's Professional Role Transition Risk Assessment Instrument*©^{2,8} and the *Professional and Graduate Capability Framework*©.^{9,10} Permission was granted by the original authors to adapt their instruments for use.

The Professional Role Transition Tool was utilised with the intent to demonstrate that, throughout the 12-month program, NGRNs have incremental improvements across four categories: Category 1: Responsibilities 13 items (plus Emotional Assessment 3 items), Category 2: Roles 12 items, (plus Emotional Assessment 5 items), Category 3: Relationships 13 items (plus Emotional Assessment 10 items) and Category 4: Knowledge Application 16 items. Each item in the survey tool was recorded on a 6-point Likert scale that consisted of Strongly Disagree, Disagree, Somewhat Disagree, Somewhat Agree, Agree, and Strongly Agree. There was also a box to record 'Not Applicable'. The Emotional Assessment questions were added to the survey instrument at the request of the Health Services Ethics Committee to monitor the NGRNs wellbeing throughout the project.

Descriptive statistical analysis was undertaken in Excel™ software using number, mean, and standard deviation. Each item was reviewed to include whether it was positively (+) or negatively worded and assessed for % agreement (sum of SA and A responses for positively worded and SD + D for negatively worded). The total number of respondents for each Likert scale were counted and recorded.

PHASE 2: QUALITATIVE INTERVIEWS

Relevant NMs were invited by email to participate in a semi structured telephone interview. A participant information sheet, which contained a description of the study, the intended interview questions and a contact email of the academic team member who would be conducting the interviews was provided. Upon contact with the academic team member, a consent form was emailed to potential participants to be completed and returned before the interview. Telephone interviews were recorded with participants' permission and transcribed verbatim. Participants' details and locations were removed from transcripts to ensure anonymity. Thematic analysis was undertaken of the transcribed data.¹¹ Two academic researchers analysed data separately, coming together to agree on final themes and sub-themes.

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FINDINGS

DATA QUALITY SUMMARY

Total of completed responses: from the Health Service private and public hospitals (Table 3).

Examination of NGRN quantitative data showed no differences across all three surveys of both public and private institutions.

The highest mean score across all surveys was in Category 3 (Relationships) (13 Items with mean scores of [4.5/ 5.0/ 5.2]) being in the Likert scale of 'agree'. Findings indicate that the graduates felt accepted in the workplace and comfortable approaching senior staff. The lowest score across all surveys was seen in Category 3 relationships in the questions related to Emotional Assessment with an average of [4.2/ 4.0/ 4.0] being in Likert scale 'somewhat agree'. These findings demonstrated that new graduates worries about responsibilities, managing challenges of shift work, being involved in clinical incidents, had difficulty sleeping between shifts and struggled taking time for self-care. However, in the question about whether or not they planned to leave the profession, over 88 % strongly disagreed.

TELEPHONE INTERVIEWS

Eight NMs responded to the invitation for an interview. Each interview lasted approximately 20-30 minutes. Six main themes were developed (Table 4).

Overall, the NMs interviewed for this study were very positive about the policy directed New Graduate Nurse Transition Program (NGNTP) and understood the importance of implementing all elements of Duchscher's Stages of Transition Theory and Transition Shock model in the clinical environment. The NMs clearly recognised the benefits to the organisation of keeping the NGRNs in their ward/unit after the transition program was complete. However, here were a few challenges in meeting the policy directives, particularly for the smaller units.

Theme 1: Unit size

It was revealed that some units/wards were too small to accommodate some components of transition stages, including mirrored shifts with preceptors, because of limited number of available staff;

My ward is quite small, I only have three nurses per shift, ... (Int3)

TABLE 3. TOTAL OF COMPLETED RESPONSES FROM THE HEALTH SERVICE PRIVATE AND PUBLIC HOSPITALS

Descriptors	Row labels	Survey 1			Survey 2			Survey 3		
		N	M	SD	N	M	SD	N	M	SD
Responsibility_13 Variable:Confident/responsible/capable	Private	73	4.8	0.5	55	4.7	0.4	22	5.2	0.4
	Public	11	4.8	0.5	20	4.8	0.4	8	5.2	0.6
	Total	84	4.8	0.5	75	4.7	0.4	30	5.2	0.4
Responsibility 3 Emotional Assessment Variable: Responsible/capable	Private	73	4.5	0.8	55	4.1	0.8	22	4.5	0.7
	Public	11	4.5	0.9	20	4.0	0.7	8	4.3	0.8
	Total	84	4.5	0.8	75	4.1	0.8	30	4.5	0.7
Roles_12 Variable: accountability/capable/ confident	Private	73	4.7	0.5	55	4.8	0.5	22	5.0	0.4
	Public	11	4.8	0.5	20	4.9	0.5	8	5.2	0.6
	Total	84	4.7	0.5	75	4.8	0.5	30	5.0	0.5
Roles_5 Emotional Assessment Variable: capable	Private	73	4.2	0.7	55	4.4	0.5	22	4.4	0.5
	Public	11	4.1	0.7	20	4.0	0.6	8	4.2	0.3
	Total	84	4.2	0.7	75	4.3	0.6	30	4.4	0.4
Relationships_13 Variable: confident/capable/accountable	Private	73	4.8	0.6	55	5.0	0.4	22	5.2	0.5
	Public	11	4.6	0.5	20	4.9	0.6	8	5.1	0.6
	Total	84	4.8	0.5	75	5.0	0.5	30	5.1	0.5
Relationships_10 Emotional Assessment Variable:capable/confident	Private	73	4.4	0.6	55	4.1	0.6	22	4.0	0.4
	Public	11	4.4	0.8	20	3.9	0.7	8	4.0	0.4
	Total	84	4.4	0.6	75	4.0	0.6	30	4.0	0.4
Knowledge_16 Variable: Confident/ capable/accountable	Private	73	4.6	0.5	55	4.8	0.5	22	4.9	0.5
	Public	11	4.5	0.6	20	4.8	0.5	8	4.9	0.7
	Total	84	4.6	0.5	75	4.8	0.5	30	4.9	0.5

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TABLE 4 SUMMARY OF INTERVIEW THEMES

	Main Themes	Sub Themes
1	Size of ward/unit makes a difference.	1.1 Units that were too small were unable to consistently accommodate preceptor requirements.
2	Appropriateness use of recent graduates as preceptors.	2.1 Staff who were recent graduates of a transition program have not forgotten what it is like to be very new.
3	Access to education support is an important part of the transition program.	3.1. Use of Learning and Development (Clinical Educators) staff on wards as extra support when a response was quickly required proved helpful.
4	Intentional support for newly graduated registered nurses.	4.1 Best outcomes resulted when there were no compromises in following the New Graduate Nurse Transition Program (NGNTP) process. 4.2 When newly graduated nurses were required to help on another ward, support of the newly graduated registered nurses and patient safety was felt to be paramount.
5	Benefits of Graduate Nurse Transition Program to patients.	5.1 Senior staff enjoyed the energy and enthusiasm of younger nursing staff. 5.2 Patients did not mind having a newly graduated registered nurse looking after them, though the importance of their being supported by a senior staff member was identified.
6	Benefits of Graduate Nurse Transition Program to organisation.	6.1 Program enables future staff recruitment. 6.2 Program reduces overall orientation time.

Probably one challenge as a manager is having to allocate a specific preceptor this is very difficult [because the unit is small]. (Int4)

The interviewed NMs were concerned that small ward size and lack of consistency of preceptors may affect the experience of NGRNs. However, this concern seemed unwarranted; although some NGRNs did not have supervision from their specific preceptors, over 90% of the participating NGRNs claimed they felt 'very confident' in approaching their assigned preceptors (See Appendix A, RL9/JS), while 7% of the graduates stated they were 'somewhat confidence' in approaching their preceptors.

Theme 2: Optimising preceptorship

The second theme highlighted the perception by NMs that NGRNs who had recently completed the transition program made good preceptors because they still understood what it was like to transition;

A lot of our preceptors we use are Level 1 [Registered Nurse] because we find Level 2s [Clinical Nurse] aren't great... the Level 1s tend to remember a little bit more about what it was like to be a new grad so we've chosen our senior Level 1s to precept our new grads with the support of our Level 2s and our team leaders. (Int1)

The value to NGRNs of regularly rostered mirrored shifts with their assigned preceptor was recognised by these participants;

If they have the mirrored shifts I think they gain more confidence. (Int3)

I think what works well is definitely when the same preceptors can work consistently with the graduate. (Int7)

Survey findings did not demonstrate significant differences between NGRNs co-workers, NMs, and even the graduates themselves as to who should precept NGRNs.

Theme 3: Access to education support

The roles of both the Learning and Development staff and the GNCs were identified as key components of the transition program. There was extensive discussion by all NM participants about the positive impact of the GNC roles and the critical influence of supporting NGRNs learning and development.

The graduate coordinators... take the grads and they go into one room and just chat about things that they've seen during the week and things that were maybe not so good and things that they thought were really interesting... It is a structured debrief. (Int1)

This extra support included provision of additional assistance for NGRNs if it was identified that a graduate was struggling with their case load.

I asked the LND [Learning and Development] person if they could actually spend extra time today on my floor to make sure that [new graduate nurse] was properly supported while the other nurses were trying to do their work. (Int3)

The Learning and Development roles added to the supportive environment for all staff on the unit. Findings related to the relationships between graduates and the hospital staff showed that over 85% of graduates reported feeling they were welcomed and over 75% feeling they were recognised and supported by staff.

Theme 4: Structure of support

Nursing Managers were very committed to providing supportive environments for NGRNs as they progressed through the stages of transition. The best outcomes resulted when there were no compromises on following the transition program policy and process and when a solid theoretical structure underpinned the initiative (See Table 2 for program process):

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They're not doing any weekends for the first month. (Int1)

We know in advance that they're coming, we're aware of their rotation dates and we roster in advance so that wasn't a problem... I had four nominated mentors (Preceptors), so each of the new grads had two each. (Int2)

When NGRNs were required to help on another ward, NMs considered what was in the graduates and patients best interests:

If we did have to redeploy a grad, the after-hours were told exactly which wards they could go to, they were wards that they had previously rotated through, so no-one was being sent to anywhere that they had never been. (Int1)

No we try not to [redeploy]... at all, we try and keep them here on the floor (Int3)

Approximately 1/3 of respondents 'did not agree' that they could deal with their responsibilities/workload before beginning their shifts. Interviews with the NMs revealed that they were attentive to NGRNs anxieties about being redeployed for a shift.

Theme 5: Benefits for patients

Benefits of a Graduate Nurse Transition Program in the provision of quality patient care was identified by all NMs. In particular, the energy and enthusiasm of NGRNs was seen as fostering a positive attitude:

The new grads that we have had through here are young, they are enthusiastic, because we are team nursing they learn the ropes, so they're more effective, and I think the patients really benefit from that. (Int2)

New grads they do offer the latest research don't they... I love new grads coming in and offering some new evidence and suggestions for change I think it's amazing. (Int7)

All preceptors and MNs acknowledged the importance of introducing NGRNs to their patients, which appeared to reassure the patients that there was a supportive supervision process (team approach) in place, and that the patients would receive optimum care:

When we do our bedside handover, we usually go as a team. And I say this is one of our NGRNs who is looking after you and they're working with our facilitator (Preceptor) today, so it gives them [patients] reassurance when they see us as a team. (Int4)

One benefit of the program to patients was the rapid increase in confidence of NGRNs as they evolved through the transition stages and were empowered to provide safe care. For instance, almost all the NGRNs felt confident talking to their team leader about their patients, over 70% were confident calling medical doctors about their patients, and over 80% were confident in escalating patient care

concerns. Although the provision of care to patients with complex needs requires a high level of nursing skill, over 40% of the respondents were confident they could deal with these patients, and over 50% were confident in looking after patients with changes in their clinical status.

Theme 6: Benefits to organisations.

The retention of the graduate registered nurses who went through the transition program was seen as a significant benefit to organisations participating in a supportive transition program for NGRNs. In this study, the majority of graduates expressed plans to return to the units where they had transitioned. For many reasons, including these now experienced nurses not needing to be re-orientated, was received by NMs as beneficial from a unit cohesion as well as fiscal perspective:

I think it's retention of well-trained staff is the big one from a managerial point of view because it's so hard to find staff that... really do fit into the culture of each ward. (Int1)

We've been able to recruit from grads which is very beneficial... but the grads that we've had that have stayed I find they're even better with the grads as well because they've been there, done that, they're young and fresh. (Int3)

Think we retain nurses through having that supportive environment... and input our values into them. (Int4)

We've got brilliant new registered nurses already hitting the ground running. (Int2)

The high retention of NGRNs at the end of the transition program was attributed to a good 'cultural fit' by NMs. This was reflected in less than 15% respondents stating they considered leaving their current workplace, and only 3% of the respondents stating they considered leaving the nursing profession.

DISCUSSION

The transition program was specifically modelled on Duchscher's Stages of Transition theory and Transition Shock model. Policy directives were incorporated into the program design to instruct NMs on each stage with the intent to maximise implementation of the key theoretical foundations. This approach aimed to provide a supportive environment where NGRNs became confident, capable, accountable, and responsible practitioners by the end of the year.

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SUPPORTED IN THEIR PROCESS OF TRANSITIONING

The survey findings supported this aim, providing evidence of positive responses to feeling supported in transitioning as registered nurses within the first five months of their program.

The affirmative results from survey data, particularly about questions relating to feeling accepted, comfortable, and confident in their role support the initiative of providing a dedicated GNC with a manageable ratio of nursing graduates. The valued contribution of the GNC role in supporting NGRNs was consistently reported by NM. One regular issue raised by NM in supporting NGRNs was the importance of a regular feedback loop from GNC to the Nursing Manager about the progress of NGRNs. Nurse Managers who were unable to regularly connect with the NGRNs relied on feedback from the GNC to determine whether or not to increase patient workload and acuity, when to roster night duty, or when a preceptor was no longer required.

BENEFITS OF A STRUCTURED GRADUATE NURSE TRANSITION PROGRAM

Overall, NMs were very positive about the benefits to patients and the organisation of a structured transition program. There was a strong sense of commitment to the theoretical framework and meeting at each stage of the policy directive allowed NMs and GNCs to communicate and troubleshoot as needed. Survey responses indicated that the foundational elements of Duchscher's theory were being implemented such that GNCs were supporting the stages of transition appropriately and, as a result, NGRNs felt welcomed, comfortable with the expectations of the workplace, and accepted by their colleagues.

The NMs recognised the organisational impact of the transition program, which included recruitment of NGRNs back to their ward/unit at the end of the program. This greatly reduced subsequent orientation time because of familiarity with both the ward environment/culture and case mix of patients. This outcome is an important fiscal consideration for health services.

BARRIERS TO PROGRAM IMPLEMENTATION

Not all practice areas were able to follow the program directive of scheduling the same preceptor on mirrored shifts with the graduate nurse for the entire 4-5 weeks. When mirrored shifts were able to be achieved it was noted by NM that the NGRNs' clinical confidence increased more rapidly. The smaller units found it more difficult to organise mirrored shifts due to a minimum number of suitable senior preceptors. It could be suggested that smaller units are not ideal for transition programs because of their inability to comply with key strategies despite their best of intentions.

PRECEPTORSHIP ROLE VARIATION

This study highlighted differing views on the skills required for a preceptor. Some NMs preferred having experienced nurses with training in preceptorship because they understood the requirements of their role in supporting graduated nurses and focusing on stage-specific strategies. Others thought that recent graduates (who had just finished their transition year) were sufficient in the role of preceptor because they could still relate to what it was like to be new. The idea of utilising recent graduates because of their proximity to the transition experience alone suggests an undervaluing or lack of understanding of the broader purpose of preceptorship/mentoring. The critical nature of tacit knowledge transfer from experienced nurses to new practitioners is one of the most important underpinnings of the preceptor/mentor role. If the definition of preceptorship, at least in part, is the sharing of relevant experience and knowledge for the purpose of enhancing clinical judgement and appropriate decision-making, then experience (time spent practicing) in that clinical context is important to the role.¹²⁻¹⁴ Preceptorship, in the context of this study, was determined to include the modelling of positive values and tenets of professional practice as well as the transferring of knowledge and the application of practice ethics within the healthcare context.

BUILDING A CULTURE OF SUPPORT

When considering the allocation of NGRNs to a particular patient demographic, one important strategy that NMs regularly employed was to introduce the NGRN to patients as part of the clinical team looking after them for the shift. The emphasis on 'team' reduced pressure on the NGRN to manage on their own and reassured patients that the novice practitioner was well-supported by other clinical experts. NMs reported positive feedback from patients who ultimately enjoyed the NGRNs energy and confident approach to providing their nursing care.

LIMITATIONS

The number of participant responses reduced over the three surveys. The high number of questions that resulted from a melding of two distinct tools may have contributed to question exhaustion and the subsequent reduction in survey response over time. It is noted that one question not included in this series of questions was related to registered nurses' salaries, which could be a factor for NGRNs to consider if they want to continue their nursing profession. This may be worth considering in future surveys. The study also occurred during COVID-19 and the negative impact on the hospitals staff, staffing levels and the NGRNs may have contributed to the reduced response rate as well as the respondent views and study findings.

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It was not feasible for the study design to incorporate an 'experimental' control group because a significant number of nursing staff across all of the hospitals had previously attended workshops based on Duchscher's Stages of Transition[®] theory and Transition Shock[®] model.^{2,8} Though some hospitals were not included in the new Graduate Nurse Transition Program, it is possible that the underpinnings of transition theory had already been incorporated into the graduate nurse programs run at each hospital.

CONCLUSION

A carefully structured Graduate Nurse Transition Program founded on sound theoretically grounded ideology alongside integrated policy directives that reflect best practices for professional role transition provides a supportive environment for NGRNs. Inclusion of a dedicated GNC role with a manageable ratio of NGRNs to senior nurse preceptors is important in supporting both graduates and nursing managers to meet the program's policy directives. This component should be costed into any Graduate Nurse Transition Program. Smaller wards/units unable to provide preceptors for the required allocated mirrored shifts may require further human resource support to be suitable for participation in Graduate Nurse Transition Programs. More education is required for senior nursing staff to really understand the nuances of the preceptor role and the stages of transition for NGRNs.

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Providing microbiology education to rural nurses: A case study

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ABSTRACT

Objective: This case study assesses a microbiology and infection control education workshop delivered to rural nurses. The study assesses workshop value through changes in respondents' self-assessed confidence using measures of microbiology knowledge, teaching, and best practice. Respondents also identified the aspects of the education perceived as most useful to their practice and barriers to implementing microbiology education in practice.

Study design and methods: Pre- and post-workshop surveys were administered to the participants. The surveys used a 7-point ordinal scale to measure respondents' confidence in explaining key concepts and their perception of the influence of such education opportunities on positive patient outcomes. Change in ratings was analysed using Wilcoxon signed-ranks tests; whilst the open-ended survey responses were analysed using a manifest content analysis.

Results: All thirteen nurses who participated in the education workshop responded to both surveys. The results demonstrated a significant increase post-workshop in confidence measures and belief that microbiology and infection control education influence positive patient outcomes. The perceived

barriers to implementation of microbiology education in practice included poor organisational culture, lack of access to training, and lack of resources.

Discussion: This case study describes a method of providing microbiology education to rural nurses and highlights the benefit of this access, particularly in the mode of face-to-face learning. A suggestion for future iterations of the program is to include content that would support nurses' implementation of theory to practice.

Conclusion: A face-to-face microbiology and infection prevention workshop, which enables participants to discuss content and undertake a tour of the pathology laboratory for practical insights, enhances nurses' self-rated confidence on this topic.

Implications for research, policy, and practice: This study demonstrates the significance of microbiology education for rural nurses and describes how this can be undertaken in practice, with insight provided on the most valued aspects. It also shows the importance of supporting in-person education. Future research could address the medium to long terms effects of this education for nurses and their practice.

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Keywords: case study; education; infection control; microbiology; nurse; rural health.

What is already known about the topic?

- Access to continuing professional development is difficult for rural nurses, particularly in comparison to their urban counterparts.
- Nurses hold a vital role in infection prevention and infection control.
- Increased knowledge leads to positive patient care and positive patient outcomes.

What this paper adds

- It demonstrates that providing microbiology education to rural nurses increases their confidence in the topical area.
- It provides an example program for delivering microbiology education to rural nurses.
- It highlights the benefits of the face-to-face aspect of education and practical component of the laboratory tour.

INTRODUCTION

Living and working in rural Australia has significant implications for clinicians' professional development and work experiences. Rural practice offers several benefits, including increased autonomy, the development of broad clinical skills, and community immersion.¹ However, rural nurses face challenges related to accessing continuing professional development (CPD) opportunities.² While online CPD programs can enhance rural nurses' access to education, not all education can be effectively delivered online and many learners still prefer face-to-face options.^{3,4} Education modalities are highly dependent on learning content, and, in nursing, there are specific considerations for teaching practical skills such as those related to infection control. Literature points to the importance of rural nurses' knowledge of infection control practices and microbiology and there is a need to understand the efficacy of different learning methods related to this content.⁵ This is further reflected in the work of Alhumaid et al which revealed gaps in healthcare workers' understanding of certain areas of infection prevention and control and emphasized the need for targeted education on these topics.⁶

This case study aims to address this gap in the literature by contributing to knowledge of effective ways to deliver microbiology education to nurses. The case study focuses on learnings from delivering education focused on microbiology for a group of rural nurses in NSW, Australia. In this context, rural is defined using the Modified Monash Model which considers remoteness and population size to classify locations across a scale of Modified Monash (MM) categories where rural encompasses MM2-7.⁷ The impetus for the training was multifactorial and included consideration of the role of nurses in infection control – particularly after the COVID-19 pandemic, the significant risk of healthcare-associated infections (HAIs) for patients,⁹⁻¹¹ limitations to accessing CPD in rural Australia,² preference for face-to-face training.¹²

In 2021, an initial microbiology education workshop was hosted for 10 rural nurses. A pre-post survey focused on the nurses' learning was conducted to examine their learning,

the results of which are published elsewhere.⁵ Following this education offering, the format and content of the workshop were modified based on participants' feedback. This case study focuses on evaluating the outcomes of the modified education offering. An outline of the education program is shown in Appendix A. The purpose of this case study is to explore the effect of the training on elements of nurses learning and confidence, to identify the most valuable parts of the training from the perspective of the respondents, outline the self-reported barriers to implementation, and provide an example of a learning program that can be used by others.

OBJECTIVE

This case study aims to:

- 1) Determine the effect of a microbiology education workshop on rural nurses' confidence in elements of infection control practice.
- 2) Describe the elements of infection control education that rural nurses perceived as the most useful.
- 3) Outline the barriers rural nurses perceive to the implementation of microbiology education in practice.

METHODS

STUDY DESIGN

This case study used pre-post cross-sectional surveys to address the research questions. The surveys are shown in Appendix B.

DATA COLLECTION

The CPD workshop was advertised as a flyer that was sent to contacts in the local health district for distribution. Nurses registered themselves using a link on the flyer. The training was provided free of charge. The principal investigator coordinated the registrations, program, and evaluation, but did not have a role in the teaching component of the CPD workshop. At the time of registration for the workshop, the nurses were provided with the participant information,

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consent form, and workshop program. Participation in the research component of the training was not mandatory due to ethical considerations related to withholding education opportunities from rural nurses in response to non-participation. When the nurses arrived at the training, they were given an envelope with the pre- and post-survey and consent forms. There were instructions on when to fill out the surveys and all surveys (whether filled out or not) were returned to the principal investigator in the original envelope at the end of the day so that researchers were blind to participation. No identifiable information was collected. The pre- and post-surveys were coupled with an identification number to pair the results.

To assess nurse learning, the surveys contained a 7-point ordinal scale to measure the respondents' confidence in explaining five key concepts to a colleague at a similar level, as well as their perception on the extent that nurses' participation in microbiology can influence positive patient outcomes. The scale ranged from 1 to 7, with the endpoints and midpoints labelled. For the confidence items, these were labelled 'not at all confident' (1), 'somewhat confident' (4), and 'very confident' (7). The influence scale was labelled 'no influence' (1), 'moderate influence' (4), and 'substantial influence' (7). In addition to the confidence and influence items, the pre-survey asked about professional background, previous training opportunities, and perception of the accessibility of best practice training. The post-survey had an additional 5-item Likert scale with a neutral midpoint about experiences in the workshop.

DATA ANALYSIS

Data were analysed using SPSS (ver. 25, IBM/SPSS Inc.). Wilcoxon signed-ranks tests were conducted due to the ordinal nature of the pre- and post-survey questions. Manifest content analysis was used to analyse the results of the open-ended survey responses. The open-ended responses were generally presented as dot points or one-two sentence summaries and thus the researchers did not attempt to discern deep meaning from the data but counted the times certain concepts were mentioned. Some responses were coded across multiple categories. The survey responses were analysed by two researchers using the stages suggested by Bengtsson including decontextualization, recontextualization, categorisation, and compilation.¹³

ETHICAL APPROVAL

This research was granted human research ethics approval by the Greater Western Human Research Ethics Committee, approval number 2023/ETH00455.

RESULTS

There were thirteen nurses (100% response rate) who responded to the pre-post survey. Table 1 shows a summary of the survey respondents, including their current work location, access to similar education in the past five years, and perception of access to education.

TABLE 1. DESCRIPTIVE SUMMARY OF SURVEY RESPONDENTS

Item	Categories	N	%
What type(s) of service do you currently work in?	Multipurpose service	6	46%
	Small rural	2	15%
	Regional	5	39%
In the past 5 years, have you received any training relevant to the field of microbiology?	No	11	85%
	Yes: partially relevant	1	8%
	Yes: directly relevant	1	8%
In the past 5 years, have you received any training relevant to the field of infection control?	No	1	8%
	Yes: partially relevant	4	31%
	Yes: directly relevant	8	62%
To what extent do you think access to education is different as a rural nurse compared to nurses in metro areas?	Less than equal	11	84%
	Equal	1	8%
	Better than equal	0	0%
	Missing	1	

Pre-post survey results

The pre-post survey results are shown in Table 2 and demonstrate a significant increase in the respondents' confidence across all five survey items related to the education content. There was no significant difference in the extent nurses thought microbiology education or infection control education influenced positive patient outcomes, but this can be attributed to the high pre-survey ratings (i.e. ceiling effect).

SUMMARY OF OPEN-ENDED RESPONSE

In the feedback, three open-ended questions were asked, out of these, two were analysed. The first open-ended question asked respondents "What was the best part(s) of this workshop?". Twelve out of thirteen participants gave valid responses to this question, and these were allocated to five codes. The second question analysed was "What (if any) barriers do you foresee in the implementation of best practice in microbiology/infection control?". There were 10 valid responses analysed and allocated to three codes. Codes, counts, and examples for each question are shown in Table 1. The third open question was "Are there any other education topics you believe are required for your nursing practice?", this was not analysed but instead used as suggestions for future workshops.

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TABLE 2. PRE-POST SURVEY ITEMS

Item	Pre Med. (Mean)	Post Med. (Mean)	Test statistic ^a	p
Confidence: Explaining the process of how microorganisms are identified from clinical samples ^b	2 (2.77)	4 (4.62)	-2.96	0.003
Confidence: Explaining the importance of accuracy when collecting samples from patients to send to the pathology lab for testing ^b	3 (3.62)	5.5 (5.33)	-2.69	0.007
Confidence: Explaining the importance of antimicrobial resistance in relation to infections ^b	4 (3.77)	4 (4.77)	-2.23	0.026
Confidence: Explaining the technology used in diagnostic labs to diagnose infectious diseases ^b	2 (2.31)	4 (4.38)	-2.97	0.003
Confidence: Explaining which antibiotics are relevant for different types of bacteria ^b	2 (2.77)	4 (4.38)	-3.02	0.003
To what extent do you think nurses' participation in microbiology education can influence positive patient outcomes ^c	6 (5.54)	6 (6.15)	-1.35	0.176
To what extent do you think nurses' participation in infection control education can influence positive patient outcomes ^c	6 (6.08)	7 (6.38)	-0.92	0.357
The delivery of content was clear and engaging ^d		4 (4.08)		
The workshop activities helped to improve my understanding of the content ^d		5 (4.46)		
This workshop has encouraged me to understand best practice behaviours ^d		5 (4.39)		
I found the laboratory tour a worthwhile use of time ^d		5 (4.39)		
I will use the knowledge I have gained today in my nursing practice ^d		5 (4.31)		
I would recommend this workshop to other nurses ^d		5 (4.33)		

a Test statistic (Z) from Wilcoxon signed rank test

b Seven-point scale: 1 (Not at all confident)..., 4 (Somewhat confident)..., 7 (Very confident)

c Seven-point scale: 1 (No influence)..., 4 (Moderate influence)..., 7 (Substantial influence)

d Five-point scale: 1 (Strongly disagree)..., 3 (Neither disagree or agree)..., 5 (Strongly agree)

TABLE 3. CODES, COUNTS AND EXAMPLE RESPONSES TO THE OPEN-ENDED QUESTIONS

Code	Count	Example/s
Q: What was the best part(s) of this workshop?		
Nurses role in specimen collection and antimicrobial stewardship	8	".. as well as specimen collection best practices"
Access to expert teaching & information	5	"Hearing from actual employees that perform the path testing"
Laboratory tour	5	"Tour of Pathology Lab"
Group and panel discussions	4	"Open discussion of all the participants as well as the microbiology associate professor"
Case study examples	4	"Case study discussion"
Q: What (if any) barriers do you foresee in the implementation of best practice in microbiology/infection control?		
Poor organisational culture and practices	5	"Change of practice in experienced nurses set in their ways"
Lack of access to training	5	"Lack of knowledge and confusion around evidence based best practice procedures"
Lack of resources; physical, staffing and time	4	"availability of ABHR in the clinical space"

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DISCUSSION

This case study demonstrates one method for providing microbiology education to rural nurses, including the topical areas that nurses found important, and the training inclusions they found beneficial. The results demonstrated no significant pre-post differences in the extent nurses thought microbiology education or infection control education influenced positive patient outcomes. This was attributed to a ceiling effect whereby the nurses had high pre-survey ratings. This reflects that although the respondents had limited previous opportunity to undertake microbiology education, they believed it could influence positive patient outcomes. Approximately 15% of respondents reported having access to microbiology education in the past 5 years, which is notable considering most of the participants worked as infection prevention specialists within their rural facility. This shows that providing this type of training was locally relevant to the area and was meeting a need for these health professionals. Access to continuing professional development has previously been noted as difficult for rural nurses,² despite the importance of providing relevant and locally based education for enhancing rural health practice.¹⁴ Although the findings of this case are only relevant to one locality, it is likely that other rural areas may similarly benefit from access to this type of education.

This case study highlights considerations for the mode of education made accessible to rural nurses. Geographical distance and technological growth have fostered a widespread adoption of online learning in recent years. It has been recognised, however, that this mode of learning is not as desirable for some people, nor is it conducive to learning certain types of content. The open-ended survey responses in this case study demonstrated elements of the workshop that were directly related to, or facilitated by, the face-to-face nature of the workshop. Activities such as a tour of the pathology laboratory and the roundtable discussions were facilitated by the nurses being onsite at the hospital that services the rural catchment area. This finding may also reflect an incidental outcome of the education as facilitating a networking opportunity to a group of geographically isolated health professionals, as was found by Kelly et al in a study of rural palliative care nurses.¹⁵ Kutoane et al also pointed to the importance of education sessions to reduce professional isolation for rural nurses.¹⁶ This may be an area for further exploration in future research.

In relation to the education outcomes of this case study, surveys respondents had increased confidence across all five survey items, including explaining microbiology processes, accuracy collecting samples, importance of antimicrobial resistance, and the use of technology in labs. This demonstrates that, for this group of respondents, the education content met its target of increasing their confidence in this topical area.

Finally, it should be noted there were several barriers identified by the nurses that they believed would affect their ability to implement their learning in practice. Several similar barriers to implementing best practice in infection prevention and control have been discussed in the literature, including organisational structure and culture, resources, and time.^{6,16} This reflects that education as a standalone intervention is not enough to embed best practice and should be scaffolded into a wider organisational approach. Future iterations of this education could include content on translating evidence into practice to facilitate the nurses' ability to implement their learnings into the workplace.

LIMITATIONS

Limitations of this study included a small, convenience sample of participants that may not be representative of the demographics and training level of the general nursing population and may have introduced a selection bias. This affects the generalisability of the study and should be considered by those seeking to design similar programs. Although the survey demonstrates an immediate effect on participating nurses', this research was not designed to test any medium to long term effects of the training.

CONCLUSION

This case study demonstrates that providing CPD focused on microbiology, including topics related to the accuracy of sample collection, the importance of antimicrobial resistance, and diagnostic technology increases nurse confidence. Providing the education onsite at the local referral hospital enabled the participants to discuss the content, and to undertake a tour of the pathology laboratory, both of which were seen as beneficial. Future research should consider opportunities for an increased sample size to achieve better generalisability and examining the long-term retention of microbiology knowledge after education sessions.

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