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Barriers and enablers to nurse-initiated care in emergency departments: An embedded mixed methods survey study

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ABSTRACT

Background: Increased demand, wait times and length of stay have seen many emergency departments implement nurse-initiated protocols In New South Wales, Australia, 74 nurse-initiated protocols have been developed for implementation. The aim of this paper is to identify the barriers and enablers to nurses' use of these protocols to inform and maximise future implementation.

Methods: Data were collected via surveys informed by the theoretical domains' framework and the Practice Environment Scale of the Nursing Work Index (PES-NWI). Descriptive statistics summarised quantitative data and content analysis was performed on qualitative data. Results were integrated and classified as barriers or enablers to nurses' use of protocols.

Results: The nurses' response rate was 82 % (n = 76) and doctors 72 % (n = 34) Six categories were generated; one barrier (lack of resources), three enablers (patient and organisational benefits, nurses' motivation, nurses' desire to develop their practice) and two were both a barrier and enabler (nurse confidence and the work environment).

Conclusion: Emergency nurses are highly motivated to use nurse-initiated protocols to positively impact patient outcomes. However, a lack of resources, time, access to education and confidence are barriers to use that need to be addressed when designing implementation.

1. Introduction

Increasing demand, undifferentiated patients with high acuity, as well as overcrowding make Emergency Departments (ED) complex environments. Patients frequently experience extended waiting times to see a doctor and long lengths of stay. Presentations to Australian EDs increased 6.9 % in one year with 8.8 million patient presentations in 2022–23, or 334 presentations per 1000 population [1]. Despite national benchmarks designed to ensure patients are discharged, admitted, or transferred within four hours of arrival only 65 % of patients were seen within the recommended time frame and just 56 % had their care completed within the four-hour target. [1,2]. In the last five years the average length of stay for ED patients in Australia has also increased [1].

In response to increasing wait times and length of stay, many EDs have implemented nurse-initiated protocols. Emergency nurses are often the first clinicians to see patients in ED and are ideally positioned to start treatment prior to patients being assessed by a doctor. Nurse-initiated is a term applied to various service models in which nurses initiate care, investigations, or medication based on standing orders or protocols [3]. Nurse-initiated protocols guide nurses to initiate specific predetermined investigations and interventions for patients meeting certain clinical criteria, for example administering pain relief and ordering an x-ray for a patient with an isolated limb injury [4],.

Nurse-initiated protocols have been shown to reduce ED waiting times and improve the patient's experience through improved time to treatment and symptom relief [5–9]. A 2021 systematic review identified that emergency nurse-initiated analgesia was associated with safe, timely and effective pain relief [10]. Similarly, studies on nurse-initiated x-rays in ED have shown the practice to be safe, effective and acceptable to patients [7]. In New South Wales (NSW), Australia, the Agency for

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Clinical Innovation (ACI) developed 74 (41 adult and 33 paediatric) Emergency Care and Treatment (ECAT) protocols to standardise nurse-initiated emergency care for implementation across NSW in 2024 [11].

While there is overwhelming evidence to support the benefits of nurse-initiated protocols in EDs, uptake and their appropriate use is variable [12]. Furthermore, nurses have reported a lack of confidence and time constraints as barriers to implementing protocols [12]. To better understand emergency nurses' adherence to protocols, studies to investigate the barriers to implementing nurse-initiated protocols have been recommended [13].

The aim of this study was to identify the barriers and enablers to emergency nurses use of nurse-initiated protocols prior to implementation of the ECAT protocols at the study site in order to enable the development of a data-driven, evidence-informed implementation strategy to maximise future uptake.

1.1. Aim

To identify the barriers and enablers to emergency nurses use of nurse-initiated protocols in the ED.

2. Methods

2.1. Study design

This study, conducted in August and September 2023, comprised an embedded mixed methods research design using surveys with emergency nursing and medical staff to identify the barriers and enablers to the use of nurse-initiated protocols. Barriers decrease the chance of the desired behavior being performed while an enabler increases the chance of the desired behavior being performed [14]. The surveys collected quantitative and qualitative data, and the analysed results were integrated and reported as categories. Categories were classified as a barrier, enabler, or both a barrier and enabler. Crossover within a domain is not uncommon when identifying barriers and enablers [15].

Ethics approval was obtained from the hospital's Human Research Ethics Committee. Reference number - 2023/ETH01182. The study complies with the National Health and Medical Research Council of Australia National Statement on Ethical Conduct in Human Research (2023)[16].

2.2. Study Site

The study was conducted at a metropolitan tertiary referral hospital that treats approximately 55,000 adult patients per year. The ED employs 93 emergency nurses on a permanent basis (full and part-time) and 85 doctors. Before the study, the ED had 12 nurse-initiated protocols and 15 medication standing orders used by accredited nurses who had completed a two-day face-to-face course and clinical assessments. Accredited nurses can initiate medication andx-rays using protocols. At the time of the study 32 % of nurses were accredited to nurse-initiated care.

2.3. Sample

Purposeful sampling was used to recruit registered nurses (RN) and doctors into the study. Emergency nurses employed permanently (full and part-time) in the ED were invited to participate. Emergency nurses included RNs, managers, educators, and nurse consultants. Full time and part time senior emergency doctors (consultants and registrars) were invited to participate in the medical survey. Nursing and medical staff work closely together in the ED and nurse-doctor relationships have shown to directly impact on the quality of patient care [17]. Therefore, it was important to understand doctors' perceptions of nurse-initiated protocols and potential barriers and enablers.

Nurses not permanently employed at the site, for example, agency nurses, were excluded from the study, as they do not use protocols. Junior doctors were excluded due to their brief rotations in the ED and their limited exposure to emergency nursing practice.

2.4. Survey

Two surveys, one for nursing staff and one for medical staff, were developed. The nursing survey had 23 questions and was informed by the Theoretical Domains Framework (TDF) [18]. The TDF provides a structured approach for assessing barriers and enablers to support implementation projects and comprises 14 theoretical domains, each representing a broad category of factors that can impact behavior change [18]. The Practice Environment Scale of the Nursing Work Index (PES-NWI) was used to measure the work environment [19].

The nursing survey comprised five sections.

(i) Participant characteristics (question one to six). Six questions on the number of years working as a nurse and in emergency, post graduate qualification, models of care in the ED (for example triage, resuscitation bays) and emergency nursing courses completed.
(ii) Nurse-initiated care (questions 7-13). Seven questions including free text responses, to understand how many nurses were accredited to use local nurse-initiated protocols, what nurses like and don't like about nurse-initiated protocols and what would improve the use of nurse-initiated protocols. Respondents were given several response options and asked to select all that applied.
(iii) Emergency Care and Treatment (ECAT) protocols (questions 14-20). Seven questions including free text responses to elicit nurses' thoughts on standardised statewide protocols and education, intention to use ECAT protocols, why or why not they would like to transition to ECAT protocols, support required and challenges to ECAT transition. A Likert scale from one strongly disagree, to 10 strongly agree was used.
(iv) Confidence in nurse-initiated care (question 21-22). Two questions to measure nurses' confidence delivering nurse-initiated care for x-rays, pathology and eight medications. Confidence was measured using a Likert scale from one, no confidence, to 10, extremely confident.
(v) The work environment. The Practice Environment Scale of the Nursing Work Index (PES-NWI) was used to elicit information about the work environment and consists of five subscales; nurse participation in hospital affairs, nursing foundations for quality of care, nurse management ability, leadership and support of nurses, staffing and resource adequacy, collegial nurse-physician relations [20]. The Practice Environment Scale of the Nursing Work Index (PES-NWI) is a validated tool measuring the nursing practice environment. Higher PES-NW1 scores are associated with improved patient outcomes, quality of care and patient experience [19]. Each subscale uses a Likert scale from one, strongly disagree, to five, strongly agree.

The medical survey comprised nine questions in three sections;.

(i) Participant characteristics (questions one to three) - years working as doctor and in emergency medicine.
(ii) Nurse-initiated care (questions four to seven and free text) - thoughts on standardising protocols and education and satisfaction with current nurse-initiated protocols.
(iii) Emergency Care and Treatment (ECAT) Protocols (questions eight and nine) to elicit doctors' level of support for ECAT protocols.

Both surveys were pre-tested for face validity by four researchers

experienced in implementation science. In addition, a small subset of three ED clinicians pre-tested the survey for comprehension of content, structure, and response options. From the pre-testing feedback, minor changes were made prior to distribution.

2.5. Survey distribution and data collection

The survey was conducted in August 2023 in paper and electronic form to make it easily accessible to shift workers and facilitate a high response rate. The principal investigator sent an introductory email to potential participants, with a link to the electronic survey. Implied Consent was obtained by the completion of the survey. No identifiable data were collected. Electronic surveys were completed anonymously online via REDCap™ (Research Electronic Data Capture), a secure web-based application used for data capture in clinical research [21] and stored on hospital password protected computer. Paper surveys were placed in the ED tutorial room and the staff tearoom. Nurses and doctors were given the opportunity to complete the survey during staff education and meetings. Participation in the survey was entirely voluntary, with no obligation or incentives to complete it. Completed paper surveys were placed in a sealed survey box and were entered into REDCap™ [22]. Data entered manually was checked for accuracy by the principal investigator. Follow-up reminder emails were sent two, three and four weeks after the initial email.

2.6. Data analysis

Quantitative and qualitative data analyses were performed separately, and results integrated to form categories and enable classification as a barrier or enabler. Analysis compared responses between nurses accredited to use nurse initiated protocols and those who were not accredited, aiming to identify differences that could influence implementation strategies.

2.7. Quantitative Data

Quantitative data captured in REDCap™ was exported into SPSS® version 29 for analysis [23]. Descriptive statistics were used to summarise results. Categorical responses were presented as frequencies and percentages to clearly represent proportional distribution and enhance interpretability [24]. Likert scale responses were reported as mean and standard deviation (SD) to assess data dissension and provide a reliable measure of data variability [24]. Median and interquartile ranges were used if data were not evenly distributed.

The difference in response between nurses who were accredited to use nurse-initiated protocols at the time of the survey, and those who were not, were compared using Chi Square tests for questions 7–13 and independent t-tests for questions 14–17 and 21 - 23 A p value $< .05$ was considered statistically significant. Qualitative Categorical questions with a response rate of 70 % or higher were classified based on their wording; negatively worded questions were labelled barriers and positively worded questions enablers [14,25].

Likert scale questions were evaluated based on their mean score. A mean score of seven or above indicated an enabler for positively worded questions and a barrier for negatively worded questions [14,25]. The PES-NW1 used a five-point Likert scale with scores greater than 2.5 considered positive and an enabler [26]. Reporting of this study adhered to the Checklist for Reporting Of Survey Studies (CROSS) [27].

2.8. Qualitative Data

Content analysis of qualitative data using NVivo 14 software[28] was performed to produce an overall summary of the content of the individual free text responses [29]. The responses were read through several times to enhance familiarity with the data. Text was sorted into areas determined by the survey questions and manifest content, then condensed and open coded. Coded data were reviewed for differences and similarities and sorted into sub-categories, then categories. Categories were then reflected on and identified as a barrier or enabler to nurses' use of nurse-initiated protocols.

2.9. Integration and classification of barriers and enablers

The quantitative and qualitative data were analysed and synthesised to identify consistent patterns and discrepancies. The results were then integrated to derive the final barriers and enablers to nurse-initiated care. Qualitative responses were categorised and used to confirm or refute the barriers and enablers identified in the quantitative data.

3. Results

3.1. Emergency nurses survey

The nurse survey response rate was 82 % (n = 76/93). Of the respondents, 83 % (n = 63/76) were RN's and 17 % (n = 13/76) held a leadership position as either Nurse Unit Manager (NUM), Clinical Nurse Educator (CNE) or Clinical Nurse Consultant (CNC). The median years of experience as an RN was five years (IQR 2.6–10.0) and two years emergency experience (IQR 1.5–5.0). Less than half (45 %, n = 34/76) of respondents had post-graduate qualifications and 32 % (24/76) worked in all clinical areas of the ED and were accredited to use existing nurse-initiated protocols. HIRAID® training [30], a pre-requisite to using ECAT protocols at the study site, had been completed by 93 % (n = 71/76) of respondents. Nurses were overwhelmingly positive regarding the benefits of nurse-initiated care for patients, demonstrated strong motivation to use protocols and expressed interest in further education for their professional development (ADD Tables 1 and 2). The ED work environment was rated highly by nurses (PES-NWI total subscale (mean (SD); 3.7 (0.7)) (supplementary table 1).

3.2. Emergency Doctors Survey

The response rate was 72 % (n = 34/47) comprising of 55 % (n = 19/47) emergency registrars and 45 % (n = 15/47) emergency consultants. The median time working as a doctor was 10 years and working in an ED eight years.

There was strong agreement amongst doctors that there should be a standardised approach to nurse-initiated care in the ED (69 %, n = 22/47,) and that all emergency nurses should have access to and training in the same nurse-initiated protocols (mean (SD); 8.7 (1.74)). Only 25 % (n = 8/47) of doctors thought a single method would not suit all situations

Table 1
Participant characteristics.

Job title	n (%)
RN	63 (83)
Leadership role	13 (17)
	Median (IQR)
Number of years as RN	5.0 (2.6 - 10.0)
Number of years in emergency department	2.0 (1.5 - 5.0)
Highest level of post graduate nursing qualification	n(%)
None	42 (55.3)
Graduate Certificate	17 (22.4)
Graduate Diploma	3 (3.9)
Masters or higher	11 (14.5)
Other	3 (3.9)
Areas of the ED participants worked in	
Acute	47 (62)
Fast track	50 (66)
Resuscitation room	19 (25)
Triage	7 (9)
Clinical Initiatives Nurse	24 (32)
Emergency Medical Unit (EMU)	45 (59)
All the above	24 (32)

Table 2
Nurse initiated protocols.

Variable	n (%)
Do you have nurse-initiated protocols in your department?	
Yes	64 (84)
No	2 (3)
Unsure	8 (11)
Missing	2 (3)
Emergency Nurses should be able to initiate care in the ED?	
Yes	73 (99)
No	1 (1.4)
Accredited to use nurse-initiated protocols in the ED?	
Yes	24 (32)
No	43 (58)

Variable	Overall n (%)	Accredited NIP n (%)	Not Accredited NIP n (%)	P-value
What do you like about nurse-initiated protocols in your ED				
Protocols are easy to access	36 (47)	20(83)	4(16.7)	< .001
Protocols are simple to use	31 (41)	18(75)	13(25)	< .001
Speeds things up for my patient	67 (88)	23(96)	44(85)	.159
Patients receive treatment quicker	62 (82)	22(92)	40(77)	.123
Patients receive diagnostics quicker	51 (67)	20(83)	31(60)	.041
Evidence supporting nurse-initiated protocols is strong	40 (52)	19(79)	21(40)	.002
Improves patient care	61 (80)	21(88)	40(77)	.282
Medical staff appreciate nurses starting care	51 (67)	20(83)	31(60)	.041
The patients appreciate it	52 (68)	21(88)	31(60)	.015
Gives emergency nurses autonomy	62 (82)	22(92)	40(77)	.123
Provides me with an ED Professional development pathway	41 (54)	16(67)	25(48)	.131
Increased job satisfaction for emergency nurses	49 (65)	17(71)	32(62)	.431
Improves patient flow in the ED	56 (74)	19(79)	37(71)	.461
Improves triage waiting times for patients	47 (62)	16(67)	31(60)	.556
Decreases patient length of stay in the ED	56 (74)	19(79)	37(71)	.461
Other – please list anything else you like about Nurse initiated protocols	2 (3)	0(0)	2(3)	.330
What don't you like about nurse-initiated protocols				
Protocols are difficult to find / access	16 (21)	16 (21)	0(0)	.002
Protocols are too detailed	9 (12)	4(17)	5(10)	.377
Protocols are too vague	5 (7)	0(0)	5(10)	.116
I am unsure when to use a protocol	12 (16)	0(0)	12(23)	.010
I do not have time to use the protocols	7 (9)	1(4)	6(12)	.302
Protocols do not make a difference to patient care	0 (0)	0(0).	0(0)	
The interventions nurses can initiate are too limited	14 (18)	4(17)	10(19)	.789
Medical staff do not support nurse initiated protocols	4 (5)	0(0)	4(8)	.163
It is difficult to document all the care I have initiated	14 (18)	4(17)	10(19)	.789
Too much training is required to use the protocols	4 (5)	0(0)	4(8)	.163
Not every ED nurse can use the protocols	42 (55)	14(58)	24(54)	.839
It does not improve waiting times for patients	3 (4)	2(8)	1(2)	1.82
Does not improve the patient's length of stay in ED	4 (5)	2(8)	2(4)	.415
Other	12 (19)	3(13)	9(17)	.593
Access to an electronic medical record to document the care I have initiated.	55 (72)	18(75)	37(71)	.727
Access to electronic protocols	49 (65)	14(58)	35(67)	.447
More detailed protocols	15 (20)	1(4)	14(27)	.021
Less detailed protocols	6 (8)	2(8)	4(8)	0.923
Junior staff (not at CIN level) are able to use the protocol	35 (46)	5(20)	30(57)	.003
More support from emergency doctors	17 (22)	2(8)	16(30)	.010
The amount of training is increased	37 (48)	7(29)	30(58)	.021
The amount of training is decreased	2 (3)	0(0)	2(4)	.330
I have time to use the protocols	27 (36)	14(58)	13(25)	.005
Expand the protocols to include more nurse-initiated care	35 (46)	14(58)	21(40)	.145

Do you intend to use ECAT protocols when appropriate in the ED	n (%)
Yes	65 (86)
No	1 (1)
Unsure	6 (8)
Missing	4 (5)

Do you think it is beneficial for all emergency nurses in NSW to -

	Overall results Mean (SD)	Accredited NIP Mean (SD)	Not accredited NIP Mean (SD)	95 % confidence interval Effect size		Mean difference	P-value
				Lower	Upper		
Use the same standardised approach to nurse-initiated care in ED i.e., all EDs use the same nurse-initiated protocols	8.9 (1.5)	9.14 (1.36)	8.89 (1.66)	−1.061	.548	−.256	0.53
Undertake standardised training programs	9.0 (1.3)	9.23 (1.27)	9.14 (1.39)	−.777	.602	−.087	0.80

(*continued on next page*)

Table 2 (*continued*)

Do you think it is beneficial for all emergency nurses in NSW to -	Overall results Mean (SD)	Accredited NIP Mean (SD)	Not accredited NIP Mean (SD)	95 % confidence interval Effect size		Mean difference	P-value
				Lower	Upper		
Have their training recognised if moving between ED's in NSW	9.0 (1.0)	9.73 (0.67)	9.44 (1.17)	−0828	.254	−.287	0.29
Why or why not you would like to transition to ECAT protocols							
I am not interested in learning something new	1.9 (2.2)	1.2 (0.61)	1.9 (2.3)	−.032	1.415	.691	.061
There are already too many protocols	3.1 (3.4)	2.5 (1.54)	3.4 2.031	.004	1.944	.974	.049
There is not enough time to change our way of working	2.6 (3.8)	2.6 (1.77)	2.71 (2.03)	−.841	1.166	.163	.747
The way we do things is fine, there is no need to change anything	1.9 (4.0)	1.9 (1.05)	1.9 (1.70)	−.800	.768	−.016	.968
My colleagues are supportive of nurse-initiated protocols	7.5 (1.8)	7.4 (1.97)	7.4 (1.98)	−.992	1.031	.019	.969
I think ECAT protocols are a positive change for our ED	8.3 (1.5)	9.1 (1.21)	8.2 (1.63)	−1.560	−.164	−.862	.016
I feel supported by ED management to use ECAT protocols	7.6 (1.9)	8.7 (1.89)	7.5 (2.09)	−2.259	−.185	−1.222	.022
I feel supported by Emergency doctors to use ECAT protocols	7.0 (2.2)	8.1 (1.92)	6.7 (2.21)	−2.597	−.420	−1.508	.007
What do you think will support the implementation of ECAT protocols in our ED							
Face to face education	9.1 (1.4)	8.8 (1.87)	9.3 (1.14)	−.272	1.155	.442	.221
Support in the clinical setting to adjust to using the ECAT protocols, for example precptoring with CNC/CNE	9.1 (1.0)	9.5 (0.80)	9.20 (1.16)	−.798	.289	−.255	.354
	Overall results Mean (SD)	**Accredited NIP Mean(SD)**	**Not accredited NIP Mean (SD)**	**95 % confidence interval**		**Mean difference**	**P-value**
				Lower	**Upper**		
Visual prompts to remind me to use ECAT protocols (e.g., posters)	7.6 (2.3)	6.6	8.2	.261	3.008	1.635	.021
Opportunity to ask questions when using the protocols in the clinical setting	8.9 (1.0)	8.7 (1.25)	9.3 (0.92)	−.026	1.183	.578	.060
Personal feedback following ECAT implementation	8.7 (1.3)	8.4 (1.44)	8.9 (1.23)	−.171	1.153	.491	.144
An ECAT policy to support my practice	8.4 (1.6)	7.9 (1.91)	8.7 (1.55)	−.114	1.555	.705	.102
Knowing there are consequences if we do not implement ECAT	5.4 (3.9)	5.5 (2.60)	5.5 (3.51)	−1.498	1.531	.016	.983
Knowing that the change is being monitored and reported	6.8 (2.3)	7.5 (2.13)	7.1 (2.67)	−1.599	.970	−.315	.627
ECAT clinical leads in ED	8.3 (1.6)	8.6 (1.63)	8.5 (1.71)	)−.904	.81.3	−.045	.916
An eMR that can be used for all nurse-initiated care, i.e., ordering diagnostics, treatment and nursing documentation in one system	9.1 (1.0)	9.1 (1.25)	9.3 (1.02)	−.374	.741	.184	.513

NIP = Nurse-initiated protocols
(1 = Strongly disagree, 10 = strongly agree) NIP = Nurse-initiated protocols

in EDs and a standardised approach was not required (ADD Table 3).

3.3. Qualitative findings

The five open-ended questions in the nurses' survey (qualitative data) elicited 252 free text comments that were coded and grouped into eight subcategories to form three categories comprising one enabler and two barriers (ADD Table 4).

3.4. Integration of Quantitative and Qualitative data

The quantitative data provided a comprehensive overview of the prevalence and frequency of barriers and enablers while the qualitative data offered contextual insights. Both data sets were merged through joint display to confirm or refute the patterns observed in the quantitative data. Joint display is a visual method for integrating data to reveal new insights and explore relationships between different types of data [31]. This integration reinforced the findings' validity and provided a deeper understanding of the factors influencing nurse-initiated care [32]. (Fig. 1).

Quantitative and qualitative integration resulted in six categories anticipated to influence the use of nurse-initiated protocols in the study site These comprised two barriers, three enablers and two categories that crossed over and were identified as both barriers and enablers to nurse -initiated care (ADD Table 5).

3.5. Influences on the use of nurse-initiated protocols in the ED

3.5.1. Lack of physical and human resources - Barrier

Nurses believed they had limited access to physical and human

resources to support their use of nurse-initiated protocols. Nurses strongly believed an electronic medical record to order diagnostics and treatment, and document care, would improve the use of protocols (72 %, n = 55/76).

The qualitative results also highlighted the perceived limitations of existing physical resources. The category 'nurses need improved access to human and physical resources' incorporates nurses' belief that the lack of an integrated information technology system and access to an electronic Medical Record (eMR) would make it difficult to use protocols. An exemplar quote from a nurse.

'EMR. It can be so unsafe with patient notes in several places at once. If it was all online, we would have safer access to patient care '(Nurse, participant ID 21).

Table 3
Emergency Doctors survey results.

Variable	Overall Mean (SD) n = 34	*Confidence interval*	
		Upper	*Lower*
All emergency nurses should have access to and training in the same nurse initiated protocols	8.8 (1.7)	−1.096	1.477
How satisfied have you been with the following in relation to nursing practice in the ED?			
Nurse initiated protocols in general	7.6 (1.5)	−.321	1.765
Nurse initiated Pathology investigations	7.4 (1.8)	−1.256	1.447
Nurse Initiated Radiology investigations	7.1 (2.3)	−1.138	2.249
Administration of nurse initiated Opioid analgesia	7.8 (7.8)	−.111	2.497
Administration of nurse initiated Simple analgesia e.g., non-opioid medication	8.5 (1.5)	−1.431	.812
administration of nurse initiated Antiemetics	8.2 (1.8)	−1.089	1.581
Administration of nurse initiated IV therapy	7.8 (1.9)	−.641	2.213
Administration of nurse-initiated Bronchodilators	8.0 (1.9)	−1.143	1.794
Administration of nurse-initiated Antihistamines	8.0 (1.9)	−1.157	1.697
Administration of nurse-initiated Thiamine	7.6 (2.1)	−1.247	2.295
Transition to ECAT protocols			
I fully support nurses initiating care	8.7 (1.0)	−.243	1.894
I don't feel management will support the transition	4.7 (2.1)	−2.305	.784
It will be better for patient care	8.2 (1.7)	−.471	1.979
It would be easier for me to just do it myself	3.3 (2.2)	−3.332	−.318
It will save me time	8.6 (1.2)	−.310	1.421
It will reduce the time to patient diagnosis	7.5 (2.6)	−.804	3.011
The way we do things is fine, no need to change anything	2.8 (1.8)	−2.235	.336
It will increase my administrative workload	2.7 (1.6)	−2.041	.247
It is beyond the scope of nursing practice	2.8 (2.0)	−2.788	0.42
It will be more work for me later	2.7 (1.7)	−2.214	.166
It will reduce waiting times for patients	7.9 (2.3)	−1.107	2.742
Nurses do not have adequate training to initiate Care	3.7 (2.8)	−2.758	1.361
There is strong evidence to support nurse initiated care	7.2 (2.1)	−1.849	1.286
It will reduce the patients time to treatment	7.5 (2.2)	−1.461	1.747

1 = strongly disagree, 10 = strongly agree

Table 4
Qualitative data categories and sub-categories of the barriers and enablers to nurse initiated care in the ED.

Categories	Subcategories	Exemplar quote
Nurses provide efficient, safe, and effective care (enabler)	• Expediated treatment (n = 107) • Improved patient care (n = 71) • Applied clinical knowledge and skills (n = 36)	*'Allows me to decrease waiting times for pts, increase pt satisfaction and diagnose quicker and provides me with increased autonomy as a nurse and increases job satisfaction' (Nurse, Participant ID 85)*
Nurses are inadequately equipped for practice change (barrier)	• Confidence and experience (n = 46) • Work environment (n = 51)	*I wouldn't feel comfortable interpreting the results and it adds extra responsibility/ stress onto my role with no extra pay* etc. *(Nurse, Participant ID 39)*
Nurses need improved access to human and physical resources (barrier)	• Resource availability (n = 47) • Knowledge for using Nurse-Initiated Protocols (n = 54) • Clinical education and engagement (n = 56)	*'I do not know what they are or how to use them' (Nurse, participant ID 98)*

Although nurses believed more education and clinical support would increase the use of protocols, in the qualitative results, nurses reported they were concerned there was a lack of human resources to facilitate this. High workloads, a lack of dedicated teaching time and limited availability of educators were identified as a barrier to the use of protocols.

'More education around them. Education reaching all staff due to shift patterns [and] limited clinical educator time. Allocated time for education, business of department, difficult to get people off the floor'. (Nurse, participant ID 28).

3.5.2. Patient and organisational benefits – Enabler

Nurses overwhelmingly believe nurse-initiated care benefits patients. More than 80 % of nurses thought nurse-initiated protocols expedited and improved patient care. They believed patients would be seen faster (88 %, n = 67/76) receive treatment earlier (82 %, n = 62/76) and that patient care would be improved (80 %, n = 61/76).

Nurses also thought nurse-initiated care had organisational benefits. They believed the introduction of nurse-initiated protocols would improve key performance indicators by reducing ED length of stay (74 %, n = 56/76) and improving patient flow though the ED (74 %, n = 56/76).

The quantitative results were supported by the qualitative results. The most common category developed from qualitative data was 'nurses provide efficient, safe and effective care'. Nurses described that nurse-initiated protocols would streamline and accelerate care because patient treatment would not be delayed by having to wait to see a doctor; nurses would be able to facilitate commencement of treatment, and in turn the patients' length of stay in ED would be reduced. Qualitative results also supported the belief that nurse-initiated care improved organisational outcomes by improving Key Performance Indicators (KPIs) related to triage benchmarks and patient flow though the ED, as illustrated by the comment from this nurse.

'Emergency nurses are often those who make first contact with the patient and are the first to assess the patient. Oftentimes care is delayed for patients as nurses are limited in the care they can initiate. Expanding the care emergency nurses can initiate may fast track and streamline care and decrease delays in the patients receiving the care they need'. (Nurse, participant ID 6).

Doctors also identified patient benefits. Reported as (mean (SD)) doctors believed nurse-initiated protocols would be better for patient

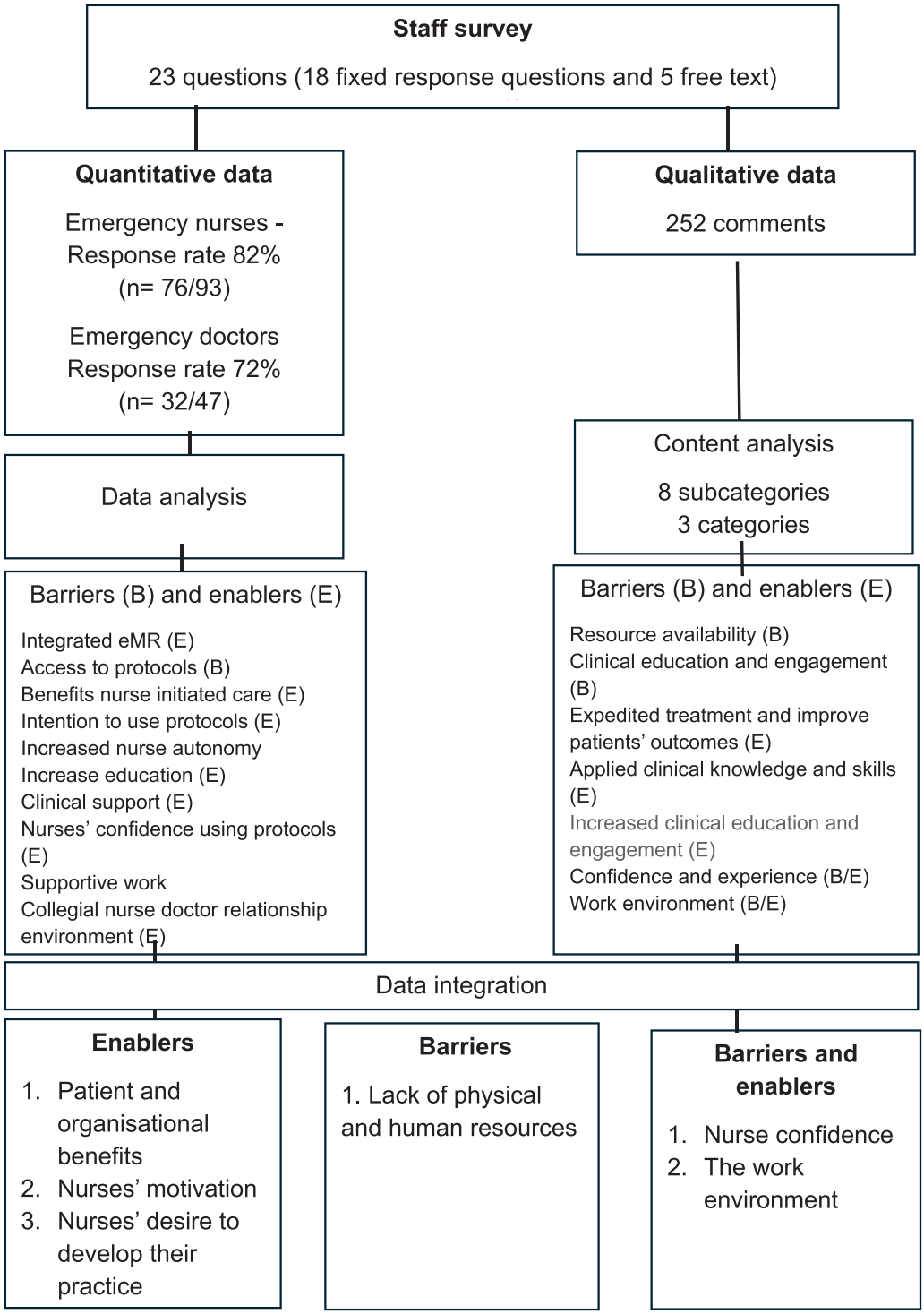

Fig. 1. Integration of quantitative and qualitative data.

care (mean 8.2 (1.7)), reduce waiting times for patients (mean 7.9 (2.6)) and improve time to diagnostic tests (mean 7.5 (2.6)) and treatment (mean: 7.5 (2.2)). An exemplar quote from a doctor in favour of nurse-initiated protocols:

> 'I love it. It's better for patients and makes my job easier' (Doctor, participant ID 10)

3.5.3. Nurses' motivation to use nurse-initiated protocols - Enabler

Nurses' belief that they have the skills, knowledge and motivation to adopt new practices was identified as an enabler of nurse-initiated protocols. Almost all of the nurses surveyed believed all emergency nurses should be capable of initiating care (99 %, n = 73/75), and a majority indicated that they intend to use the protocols (86 %, n = 65/76) and that the protocols would increase their autonomy (82 %, n = 62/76) in the ED. Reported as (mean (SD)) nurses strongly agreed that nurse-initiated care was a positive change for the ED (mean 8.3 (1.5)), that EDs should use the same protocols (mean 8.9 (1.5)), and standardise training (mean 9.0 (1.3)) so that training could be recognised if nurses moved between EDs within the state (mean 9.0 (1.0). Nurses disagreed

Table 5
Barriers and enablers to the use of nurse-initiated protocols in the ED.

Theme	Quantitative evidence Barrier (B) or enabler (E)	Qualitative evidence Barrier (B) or enabler (E)
Lack of resources	Nurse strongly disagree (< 70 %) that –(B) • Protocols were easy to access Nurse strongly agreed (>70 %, mean > 7) that – (E) • An eMR would improve the use of protocols • All nursing care ordered and documented should be in one integrated electronic system	**Resource availability (B)** (47 comments) Nurses felt the use of protocols would be limited due to – • A lack of an integrated information technology system • A lack of access to an electronic Medical Record (eMR) • Difficulty accessing protocols using current information technology systems. *'EMR. It can be so unsafe with patient notes in several places at once. If it was all online we would have safer access to patient care ' (Nurse, participant ID 21)* **Clinical education and engagement (B)** (56 comments) Nurses were concerned– • They would not have protected time to attend education due to their workload • Nurse educators would not be available to provide education and clinical support More education around them. Education reaching all staff due to shift patterns limited clinical educator time. Allocated time for education, business of department difficult to get people off the floor'. (Nurse, participant ID 28)
Patient and organisational benefits	Over 80 % of nurses believed nurse-initiated care - (E) • Speeds things up for patients • Receive treatment and diagnostics quicker • Diagnostics quicker • Improves patient car Over 70 % of nurses believe (E) • Improves patient flow • Decreased LOS	**Expedited treatment and improve patients' outcomes (E)** (178 comments) Nurse initiated care results in - • Patient seen quicker • Treatment is started earlier • patients' length of stay in ED reduced. • Patient care and outcomes improved patient care Improved key Performance Indicators (KPI's) - Triage benchmarks and patient flow though the ED. '*Emergency nurses are often those who make first contact with the patient and are the first to assess the patient. Often times care is delayed for patients as nurses are limited in the care they can initiate. Expanding the care emergency nurses can initiate may fast track and streamline care, and decrease delays in the patients receiving the care they need' (Nurse, participant ID 6)*
Nurses' motivation to use nurse-initiated protocols	Over 80 % of nurses believe (E) • Nurse should be able to initiate care • They intend to use the protocols • Increases nurses' autonomy Nurses strongly agree (mean score > 7) (E) • The introduction of protocols is a positive change for the ED • ED's should use the same protocols • Training is standardised • Training is recognised across the state	**Applied clinical knowledge and skills (E)** (36 comments)- Respondents believed Nurses have the clinical skills and knowledge to safely initiate care and nurse-initiated care - • Gives nurses greater autonomy • Facilitates career progression • Increases job satisfaction. '*We are university trained professionals with years of practical experience. we are trained in clinical judgement and problem solving. these attributes are rarely respected or acknowledged outside of our profession so to be able to initiate care in ED I think gives our abilities the recognition they deserve*' (Nurse, participant ID 43)
Desire to and develop nursing practice	Nurses strongly agreed (mean score > 7) they wanted– (E) • Education • Clinical support • Opportunities to ask questions • Personal feedback Nurses strongly disagree (Mean score < 3) (E) • They were not interested in learning something new • There was no need to change current practice	**Increased clinical education and engagement (E)** (32 comments) To increase protocol use nurses wanted - • More education • Clinical leads • Mentoring • Support from doctors • Direct feedback 'I would really appreciate some education and training, so I get familiar with the protocols and support on the floor to discuss findings with senior staff'. (Nurse, participant ID 45)
Nurses' confidence initiating care	Nurse confidence was high (mean > 7.0) initiating - (E) • Pathology • X-rays • Opioid analgesia • Simple analgesia • Bronchodilators • Antihistamines • Thiamine • Antiemetics • IV fluid • IV antibiotics Less than half the nurse (35/76, 46 %) believed junior staff should use protocols. (B)	**Confidence and experience (B)** (46 comments). Nurses believed they - • Were not adequately equipped for a change in practice. • Do not have the knowledge or experience using nurse-initiated protocols • Are not confident initiating care • Unfamiliar with protocols and • unsure when to start a protocol • Concerned they would not pick the correct protocol

(*continued on next page*)

Table 5 (*continued*)

Theme	Quantitative evidence Barrier (B) or enabler (E)	Qualitative evidence Barrier (B) or enabler (E)
		• Concerned they could initiate the wrong treatment and diagnostics for patients. **Confidence and experience (B)** (46 comments) Nurses believed they were - • Unfamiliar with protocols and • unsure when to start a protocol • Concerned they would not pick the correct protocol • Concerned they could initiate the wrong treatment and diagnostics for patients. 'Lack of knowledge and difficulty picking the correct protocol, Lack of confidence to order medications or x-rays' *(Quote from a nurse)*
Work environment	The work environment was rate highly (mean score >2.5) by nurses for – (E) • Nurse participation in hospital affairs • Nursing foundations of quality of care • Nurse managers ability, leadership and support of nurses • Staff resource and adequacy • Collegial nurse doctor relationships Over 70 % of nurse believed – (E) • Colleagues were supportive of nurse-initiated protocols • Feel supported by Ed management to use protocols • Supported by Ed doctors to use protocols	**Work environment (B)** (51 comments) Nurses believed they may be unable to use protocols due to - • High workloads • The extra time needed to use protocols • Extra responsibility '*When working in acute I may be so busy managing my patient load, that following protocols and nurse initiating treatment will add another job to my already too big* list' Nurse, participant ID 10)

with the suggestion that current nursing practice should not change (mean 1.9 (4.0).

The qualitative category 'nurses provide efficient, safe and effective care' and subcategory 'applied clinical knowledge and skills,' further demonstrated nurses' belief they had the clinical skills and knowledge and motivation to safely initiate care in ED. They believed that authority to initiate care gives nurses greater autonomy, facilitates career development and progression, and increases job satisfaction. An exemplar quote from a nurse:

> 'We are university trained professionals with years of practical experience. We are trained in clinical judgement and problem solving. These attributes are rarely respected or acknowledged outside of our profession so to be able to initiate care in ED I think gives our abilities the recognition they deserve' (Nurse, participant ID 43)

3.5.4. Desire to receive education and develop nursing practice - Enabler

Nurses disagreed with the statements that they were not interested in learning something new (mean 1.9 (SD2.2)). They expressed a strong desire to learn new things related to their practice, and this interest was identified as an enabler to the use of protocols. Nurses wanted face to face education (mean 9.1 (1.4)) support in the clinical setting, for example, through CNC/CNE preceptors (mean 9.1 (1.0)), opportunities to ask questions (mean 8.9 (1.0)) and receive personal feedback (mean 8.7 (1.3)). Nurses who were not accredited to use protocols thought the amount of training should increase significantly more than for accredited nurses (58 %, n = 30/52) v (29 %, n = 7/24) (p = .02).

Qualitative results supported the quantitative result that nurses desired to learn something new and were represented in the category 'nurses provide efficient safe and effective' care' and the subcategory 'applied clinical knowledge and skills. When asked to list potential strategies to support ECAT implementation, nurses commonly described a need for more education, clinical support and feedback. Nurses wanted to know how to use protocols safely and appropriately and believed education and clinical engagement would facilitate this. Mentoring, ECAT Clinical Leads, direct feedback to individual staff, and support from senior nurses and doctors were recognised as ways to support nurses to use protocols. An exemplary quote from a nurse.

> 'I would really appreciate some education and training, so I get familiar with the protocols and support on the floor to discuss findings with senior staff' (Nurse, participant ID 45)

3.5.5. Confidence initiating care – enabler and barrier

Nurses' confidence using nurse-initiated protocols varied and were identified as a barrier and enabler to the uptake of protocols. Some nurses believed they were not equipped for practice change and lacked knowledge and experience to use protocols. Less than half the nurses (46 %, n = 35/76) believed junior staff should use protocols.

This result was supported by the qualitative category, 'nurses are inadequately equipped for practice change.' When asked to describe the challenges to using nurse-initiated protocols, a lack of confidence, knowledge, skill and understanding of protocols were the most common issues identified. Nurses were unfamiliar with protocols and unsure when to start one. They were also concerned there was a risk they would start the patient on the wrong protocol or initiate incorrect treatment and/or diagnostics for patients, as illustrated in these comments:

'(Staff) Lack of knowledge and (have) difficulty picking the correct protocol, Lack of confidence to order medications or x-rays' (Nurse, participant ID 13).

However, nurses rated themselves as confident in identifying the need to start nurse-initiated care (mean 7.9 (1.7)). Confidence was the highest for commencing treatment with simple analgesia (mean 9.2 (1.39)), bronchodilators (mean 9.1 (1.3)) and intravenous fluids mean (mean 8.6 (1.5)). Nurse-initiated treatment with opioids (mean 7.1 (2.6)) and antihistamines (mean 7.4 (2.0)) were associated with the lowest confidence rating (ADD Table 6).

There were some statistically significant differences in confidence between nurses accredited to use protocols and those not accredited. Accredited nurses were significantly more confident identifying the need to start a protocol than unaccredited nurses (22 %, n = 11/52) v (0 %, n = 0/24) (p < .001). Accredited nurses also demonstrated significantly greater confidence in several clinical tasks compared to non-accredited: initiating protocols (mean 9.2 (1.3)) vs. (mean 7.2 (1.5) (P < .001)), ordering x-rays (mean 8.7 (2.0) vs. 6.0 (2.5), P < .001)), administering opioid analgesia (mean 8.5 (2.3) vs. 5.9 (2.3), P < .001).

3.5.6. Work environment - enabler and barrier

The ED work environment was rated highly by nurses. The PES-NWI total subscale mean score was mean 3.7/5 (SD 0.7) classifying the overall ED work environment as favourable and an enabler to protocol uptake. Five out of five sub-scores had a mean score greater than 2.5/5 further confirming a positive work environment.

Overall, there was strong support for the use of nurse-initiated protocols from doctors and nurses. Nurses felt supported by nursing

management (mean 7.6 (1.9)) and nursing colleagues (mean 7.5 (1.8)) (Table 2). Doctors supported nurse-initiated care (mean 7.6 (1.5)) and disagreed that it was outside a nurses' scope of practice (mean 2.8 (2.0)) (Table 3). Collegial nurse-doctor relationships were also identified in the PES-NWI with an overall mean score of 4.3. However, nurses who were not accredited to use nurse-initiated protocols felt significantly less supported by ED management (mean 7.5 (2.0) v 8.7 (1.9), (p = .022)) and doctors (mean 6.7 (2.2) v 8.1 (1.9), (p = .004)) (Table 2).

The qualitative data did not support the quantitative result of a positive work environment. In the theme 'Nurses' confidence initiating care' the category 'nurses are inadequately equipped for practice change', showed that respondents felt the work environment was not conducive to them changing practice (Table 5). Some nurses felt the workload in ED was already too high and use of protocols would further increase their workload. Respondents were concerned they would not have enough time in their workday to use protocols and felt they did not want the extra responsibility of initiating care. This was reflected in an exemplar quote from a nurse.

'When working in acute I may be so busy managing my patient load, that following protocols and nurse initiating treatment will add another job to my already too big list' (Nurse, participant ID 10).

4. Discussion

Evidence-based nurse-initiated protocols in EDs enhance patient care, optimise health care resources, and enhance health care outcomes. The barriers and enablers to emergency nurses use of nurse-initiated protocols in the ED, in preparation for the implementation of state-wide standardised protocols were identified in this study. Using a mixed methods approach our survey findings identified six influencers to nurse's use of protocols, containing one barrier, three enablers and two barriers and enablers.

Patient and organisational benefits were clear enablers for nurses to use protocols. Nurses widely perceived protocols as expediting treatment, enhancing patients' outcomes, and positively impacted on organisational KPIs such as time to treatment and ED length of stay. Likewise, doctors expressed strong support for standardised protocols and recognised their potential to improve patient care and outcomes. Our findings are consistent with previous research demonstrating that nurse-initiated care improves the safety, timeliness, and effectiveness of interventions in EDs [5–8, 33]. A 2016 systematic review on nurse-initiated analgesia for patients in ED's reported a significant reduction in time to analgesia and pain scores, while a Canadian nurse-initiated hip fracture protocol reduced ED length of stay by 224 min [34]. These findings reinforce clinicians' perceptions that protocols lead to better patient outcomes, supporting the argument for their widespread implementation.

Motivation was a driving factor for nurses to use nurse-initiated protocols, reflecting their desire to advance practice and increase autonomy. This motivation is consistent with research indicating that nurses are more likely to adopt new practices if they perceive them as evidence-based and beneficial to patient outcomes [35] [36]. Increased autonomy is also associated with positive improved patient care, safety, and staff retention [37, 38, 39]. Our findings not only reaffirm the critical role of clinician motivation and autonomy in practice adoption but also emphasise the necessity of fostering clinician motivation as a fundamental component of successful protocol implementation. Unlike earlier studies that viewed motivation as supportive, our research positions it as essential, advocating for strategies that enhance clinician motivation to sustain protocol adherence and improve patient outcomes.

Education was seen as critical by study participants to facilitate the implementation of nurse-initiated protocols, although many nurses believed that despite education being scheduled, high workloads would prevent them from attending. This echoes existing literature which identifies a lack of non-clinical time for professional development has become increasingly problematic for nurses, exacerbated by heavy clinical demands and insufficient downtime [37]. While previous studies have documented barriers to professional growth and the adoption of evidence-based practices, our research uniquely identifies the specific challenges nurses face in accessing educational opportunities. This highlights the need for systemic reforms to allocate non-clinical time, which is crucial for the successful implementation of nurse-initiated protocols.

Nurses expressed a clear need for face-to-face training, educational support, clinical mentorship, and feedback. Several studies have highlighted the importance of educational reinforcement to drive practice change and improve patient outcomes within nursing and healthcare [5,

Table 6
Nurses confidence using nurse-initiated protocols.

Variable	Overall results Mean (SD) n = 76	Accredited NIP[a] Mean (SD) n = 24	Not accredited NIP Mean (SD) n = 52	95 % confidence interval		Mean difference	P value
				Lower	Upper		
How Confident are you Identifying the need to start nurse-initiated care	7.9 (1.7)	9.2 (1.3)	7.2 (1.5)	−2.749	−1.251	−2.000	< .001
Pathology	7.8 (1.7)	9.4 (1.2)	8.3 (1.0)	−1.900	−.307	−1.104	.007
Medical imaging (x-rays)	8.5 (1.6)	8.7 (2.0)	6.0 (2.5)	−3.907	−1.506	−2.707	< .001
Opioid analgesia	7.1 (2.6)	8.5 (2.3)	5.9 (2.3)	−3.654	−1.386	−2.520	< .001
Simple analgesia, for example paracetamol	9.2 (1.4)	9.6 (2.1)	8.9 (1.6)	−1.267	−.136	−.565	.133
Bronchodilators	9.1 (1.3)	8.23 (1.7)	7.1 (2.1)	−2.269	−.245	−1.257	.016
Antihistamines	7.4 (2.0)	8.9 (1.3)	7.5 (2.0)	−2.270	−.640	−1.455	< .001
Thiamine	7.9 (1.9)	8.7 (1.9)	7.5 (2.5)	−2.408	−.067	−1.237	0.39
Antiemetics	7.8 (2.3)	9.1 (1.6)	8.5 (1.6)	−1.447	.154	−.647	.112
IV fluids	8.6 (1.5)	8.9 (1.3)	7.5 (2.0)	−2.409	−.380	−1.394	.008
IV antibiotics	7.9 (2.0)	6.1 3.3	5.9 (2.6)	−1.922	.0899	−.511	.472

a NIP; Nurse initiated Protocols

15, 25, 30, 33, 38–41]. One study in Australia found that 95 % of participating nurses desired educational opportunities before engaging in nurse-initiated analgesia practices [42]. Targeted educational initiatives tailored to nurses' experience levels are essential for promoting the adoption of nurse-initiated protocols. Specifically, training and mentorship for less experienced nurses are crucial for building the confidence and competence needed for effective implementation. Addressing these gaps can help mitigate barriers related to high workloads and limited resources.

In our study, nurses' confidence in using nurse-initiated protocols was variable and was identified as both a barrier and enabler to their adaption into practice. Nurses who had undergone specialist training programs and were familiar with nursing protocols exhibited significantly higher confidence in initiating care compared to those with less experience in protocol use. Our study revealed a notable contrast in emergency nursing experience among respondents, ranging from decades-long tenure to relatively brief durations of less than a year.

These finding aligns with existing literature emphasising the pivotal roles of experience, knowledge and confidence in shaping nursing practice [43]. While clinicians may possess expert clinical knowledge, they are often not familiar with or confident to implement evidence-based interventions effectively, efficiently and sustainably into routine clinical practice [44]. A study investigating nurse-initiated medication in EDs found a direct association between confidence and practice: as nurses became more familiar with the protocols, their confidence increased, resulting in higher rates of medication initiation [43]. Our study highlights the need for targeted interventions, particularly for less experienced nurses, to ensure that they receive adequate support and training during the protocol implementation process.

A conducive work environment within the ED emerged as a key facilitator in effective implementation of nurse-initiated protocols. Extensive research supports the correlation between the work environment and the quality of nursing care, patient safety and productivity [19, 20, 45–47] and underscores its pivotal role in influencing clinical practice and adherence to protocols. However, despite support from colleagues and management, concerns surfaced regarding resource constraints, particularly concerning the lack of an electronic Medical Records (eMR). This necessitates careful consideration in devising the implementation strategy. Utilising the evidence on the impact of eMR is crucial to dispel misconceptions that it may serve as a single solution to protocol uptake. While eMR systems can enhance efficiency, reduce errors, and improve interprofessional communication, they may also divert nursing attention away from direct patient care, potentially affecting the nurse-patient relationship [48–50]. Addressing these concerns and clarifying that eMR systems cannot solely resolve protocol adherence challenges will be essential for successful implementation.

Limitations of our study include its implementation at a single site, and lack of variability in participants' years of experience, which limits generalisability of results. Additionally, the protocols that were to be implemented were not available for nurses and doctors to reference during the study, which may have impacted their knowledge and confidence related to specific protocols. It is challenging to implement and sustain evidence-informed protocols when clinicians face competing health care priorities [51]. Identifying these barriers and facilitators informs future research and underscores the need to develop targeted implementation strategies.

Overall, this study contributes important new knowledge regarding clinician perceptions and the multifaceted factors that influence the adoption of nurse-initiated protocols in EDs. While emergency nurses and doctors reported strong support for nurse-initiated protocols, challenges related to resource constraints, education, and workload remain. Addressing these issues through tailored implementation strategies that consider the unique needs of emergency nurses will be crucial in realising the full potential of nurse-initiated protocols to improve healthcare outcomes.

5. Conclusion

This study identified the complexities of implementing nurse-initiated protocols in ED's. Several barriers and enablers to successful implementation were described that warrant further exploration. Future research should focus on designing and evaluating tailored evidence based implementation strategies that facilitate the integration of nurse initiated care into routine nursing practice.

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Declaration of Competing Interest

We declare author Prof Kate Curtis is an Associate Editor and Prof Margaret Fry is a Senior Editor for the Australasian Emergency Care.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.auec.2024.10.003.

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