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Research paper

Emergency nursing workload and patient dependency in the ambulance bay: A prospective study

Wayne Varndell (MN (Research), BSc (Hons) Nursing, PGCert (Ed.) GradDip (AP), PhD Candidate)[a,*],
Elizabeth Ryan (RN, Cert. Emerg.)[b],
Alison Jeffers (BSc (Nursing), MSc (Hons) Emergency Nursing)[b],
Nadya Marquez-Hunt (BN, PGCert (Emerg.))[b]

[a] Prince of Wales Hospital Emergency Department, Faculty of Health, University of Technology, Sydney, Australia
[b] Prince of Wales Hospital Emergency Department, Australia

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ABSTRACT

Aim: The purpose of this prospective observational study was to characterise patients occupying the ambulance bay and to determine the ensuing nursing workload.
Background: The number of patients presenting to ED by ambulance is increasing. During periods of peak demand and access block in the ED, patients with ongoing care needs, requiring continual assessment and symptom management by emergency nurses can remain in the ambulance bay for extended periods of time. The profile of these patients and on the related nursing workload is not well known.
Methods: A prospective observational study design based upon a convenience sample of patients was conducted over a randomly selected four-week period. Nursing workload was assessing using the Jones Dependency Tool. A modified Work Observation Method By Activity Timing technique was used to estimate direct nursing care time.
Results: Of 4068 presentations to ED, 640 (16%) occupied the ambulance bay following triage, of which the majority ($n = 408$; 64%) had arrived by ambulance. Of those occupying the ambulance bay 205 (32%) were evaluated using the JDT. The majority of patients had potentially life-threatening symptoms (ATS 3, $n = 424$; 66%), were moderately dependent ($n = 134$; 65%), and consumed approximately 152.1 h of direct nursing care time. A large proportion of direct nursing care time was spent on patient reassessment (60.4 h) and pain management (29.6 h). Patients occupying the ambulance bay had an average ED length of stay of 5.6 h (4.6 h), of which 1.8 h (SD 1.8 h) was spent delayed in the ambulance bay.
Conclusion: Early detailed assessment and symptom management of patients occupying the ambulance bay is extensively undertaken by emergency nurses. The frequency and number of patients off-loaded into non-clinical areas is not currently monitored or reported upon. This study has demonstrated that patients managed in the ambulance bay consume large amounts of nursing resources, commonly require acute level care and hospital admission.

Introduction

The ambulance bay is the main point of entry for patients presenting by ambulance to the emergency department. From 2010 to 2015, the number of patients requiring ambulance services to travel to an emergency department (ED) in Australia has increased by 18% [1,2]. During periods of peak demand for emergency care, overcrowding and access block can occur, resulting in patients remaining in the ambulance bay for extended periods of time; which has received increasing attention by the media [3,4]. Overcrowding occurs when the physical and staffing capacity of the department is exceeded by the number of patients waiting to be seen [5], and has been described as the most serious problem and most avoidable cause of harm facing hospital systems [6]. While ED overcrowding is a multifactorial problem, the single most important factor affecting ED overcrowding is the availability of sufficient inpatient beds [7]. When admitted patients in ED cannot access appropriate inpatient beds, known as access block [8], subsequent patients presenting to ED experience longer waiting periods for assessment and treatment such as patients presenting by ambulance. Ambulance operations are impacted by poor patient flow through the hospital and ED, leading to increased ambulance

* Corresponding author.
E-mail address: wayne.varndell@health.nsw.gov.au (W. Varndell).

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What is known

ED overcrowding and access block are international problems that impact on the delivery of emergency care and result in poor patient outcomes.
Currently there is no standardised system in Australian jurisdictions for calculating ED patient dependency.
There is currently no national agree upon approach to calculating nurse staffing levels.

What this paper adds

This is the first study of its kind to explicate the consumption of nursing time for patients requiring care within the ambulance bay.
Early symptom management and detailed assessment of patients occupying the ambulance bay is extensively undertaken by emergency nurses to ensure patient safety and comfort; work that is often invisible.
The frequency and number of patients off-loaded into non-clinical areas is not currently monitored or reported upon.
Patients are often older and experience significantly longer delays in accessing an ED treatment area, symptom management, and medical attendance and ED length of stay.

holding time at the ED (i.e. ramping); reduced ambulance response capacity; increased ambulance response times; increased ambulance delays; increased stress and interpersonal conflict between patients, paramedics and ED staff; and, increased patient mortality [9–11]. Increasing delays in transferring patients from the ambulance stretcher into an ED bed or chair is a problem in many hospitals both in Australia and internationally [12–15]. While boarding patients in the ambulance bay is not desirable, it often occurs as a consequence of ED overcrowding and access block [16]. When there are no available ED beds or treatment areas to transfer patients to once they have arrived via ambulance, they either remain in the ambulance bay or are transferred to a waiting area, which has major implications for nursing.

Nurses not only provide initial but also continuing care for all patients presenting to the ED, including those waiting in the ambulance bay. The ED is a dynamic environment, in which a high volume of undifferentiated patients with varying levels of urgency must be assessed and treated in a timely manner. As the number of patients in the ambulance bay increases, resources are redirected from other patient care areas to ensure timely triage, early assessment and initiation of appropriate clinical care. Patients waiting in the ambulance bay have ongoing care needs and require continual assessment and symptom management, often by emergency nurses. The impact of this on nursing workload is not well known. The purpose of this prospective observational study was to: (i) characterise patients occupying the ambulance bay; (ii) evaluate nursing workload using the Jones Dependency Tool [17]; and, (iii) quantify direct nursing care time.

Methods

Sample and setting

The study took place in a metropolitan adult ED that in 2015 managed 56,740 presentations. The ED has 43 beds divided across five areas, which are staffed at different nurse-to-patient ratios according to the acuity of patient care: resuscitation bay ($n = 3$, 1:1), acute ($n = 12$, 1:3), sub-acute ($n = 9$, 1:5), fast track ($n = 9$, 1:5) and the emergency medical unit ($n = 10$, 1:5). The study site ambulance bay was approximately 24 m^2, which extended from the ambulance bay corridor of approximate 46 m^2 that was divided by a pair of sliding doors. Adjacent to this was the Psychiatric Emergency Care Centre (PECC). Within the ambulance bay itself, several chairs aligned two walls (Fig. 1).

Inclusion criteria

Due to the nature of emergency care, clinicians commonly assess patients prior to completing electronic documentation, including updating the electronic patient record as to the patient's location within the department. To allow for this time delay, patients occupying the ambulance bay for longer than 7 min were evaluated using the Jones Dependency Tool data collection form.

Exclusion criteria

Patients not allocated to the ambulance bay following triage, or not located in the ambulance bay for longer than 7 min were excluded from the study.

Data collection

Clinical data were obtained from multiple sources on patients presenting over a randomly selected four-week period (September 7th and October 4th 2015). Patient demographic, diagnosis, location and disposition data were extracted from standard electronic medical report system reports. Patient dependency data were collected using the Jones Dependency Tool (JDT) [17]. Patient dependency can vary greatly over time as clinical stability can fluctuate from one moment to the next [18,19]. Consequently, approaches to assessing patient dependency and its relationship to actual nurse workload needed to be prospective. There is at present no standardised system currently used in Australia for determining ED patient dependency. The JDT was identified as being the only prospective assessment tool that demonstrated good evidence of validity, reliability, simplicity, feasibility and generalisability in measuring patient dependency in the ED setting [18,20–22].

The JDT comprises of six domains, which are: communication; airway, breathing and circulation (ABC); mobility; eating, drinking, elimination and personal care; environment, safety, health and social needs; and triage category. Each domain is rated on a three-point scale from 1 (no impairment) to 3 (complete impairment). The highest rated level of dependency for each of the six domains are then added together to give an overall score (Fig. 2).

Final scores are classified into one of four dependency levels: low (score range 6–7), moderate (score range 8–12), high (score range 13–15) or total (score of 16–18). Patients categorised as low dependency require minimal nursing intervention, at moderate dependency patients require regular nursing interventions and are encouraged to become independent, high dependency patients require skilled frequent nursing interventions and regular observation and total dependency patients require one to one advanced nursing care [21].

Calculating mean direct nursing care time was guided by a modified Work Observation Method By Activity Timing technique [23]. Prior to commencing the study, nurses working in the ambulance bay were timed completing several activities, which included triaging, reassessment, medication administration (opiate, non-opiate and other), patient assessment for and ordering of appropriate X-ray, pathology collection including insertion of peripheral intravenous cannula, and ECG acquisition. An average (mean) time was then calculated from ten observations for each activity.

Procedure

Data collection was conducted by the emergency nurse allocated to triage patients arriving by ambulance each shift. Patients were first triaged and escalated as appropriate prior to evaluating