



Clinical paper

The effect of multi-professional education on the recognition and outcome of patients at risk on general wards[☆]Lone Fuhrmann^{a,b,*}, Anders Perner^c, Tobias W. Klausen^d, Doris Østergaard^{a,b}, Anne Lippert^{a,b}^a Danish Institute for Medical Simulation, Herlev Hospital, Capital Region of Copenhagen, Denmark^b University of Copenhagen, Denmark^c Department of Intensive Care, Rigshospitalet, Denmark^d Herlev Hospital, Capital Region of Copenhagen, Denmark

ARTICLE INFO

Article history:

Received 14 January 2009

Received in revised form 2 July 2009

Accepted 8 July 2009

Keywords:

Medical emergency team

Patient safety

Vital signs

Prevention

Staff awareness

Education

Patient simulation

Team training

Professional education

ABSTRACT

Aim: The aim of this study was to evaluate the effect of multi-professional full-scale simulation-based education of staff on the mortality and staff awareness of patients at risk on general wards.**Design, settings and patients:** A prospective before-and-after study conducted on four general wards at Herlev Hospital, Denmark. In the pre-intervention period (June–July 2006) and post-intervention period (November–December 2007), all patients on the wards had vital signs measured in the evening by study personnel, who also asked nursing staff questions about patients with abnormal vital signs. The mortality of patients with abnormal vital signs was registered from the hospital database. Simplified medical emergency team calling criteria were used to define abnormal vital signs.**Intervention:** In the intervention period (February–June 2007), 50% of medical and 70% of nursing staff on the wards (app. 220 members of staff) were trained in a 1-day multi-professional full-scale simulation-based course.**Results:** In the pre- and post-intervention periods, 690 and 873 patients were included and of these 129 and 155, respectively, had abnormal vital signs. No significant differences were observed between the pre- and post-intervention periods concerning the incidence of patients with abnormal vital signs ($p = 0.64$), staff awareness of patients at risk ($p = 0.80$), 30-day mortality ($p = 1.00$), 180-day mortality ($p = 1.00$) or length of hospital stay ($p = 0.11$) among patients at risk.**Conclusions:** This multi-professional education of staff did not affect the rate of mortality or staff awareness of patients at risk on the wards.

© 2009 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

In a previous study, we reported that one out of five patients on general wards in our hospital developed abnormal vital signs and that these patients had an increased risk of dying.¹ Half of these patients at risk, however, did not have their vital signs taken and were unrecognised by the nursing staff. On the participating wards vital signs were only measured on indication but not as a routine.¹ Early recognition and timely treatment of the patient at risk may improve outcome, but several studies have shown that the quality

of recognition and management is suboptimal.^{2–6} One ongoing discussion concerns whether educational programmes for staff on the wards result in a unified understanding of the signs and needs of the patient at risk and thereby improve patient outcome.^{6–8} However, the effect of educational interventions on staff recognition and management of the patient at risk on the ward has not been assessed in a controlled trial.

We developed a multi-professional educational programme to improve the awareness and management of patients at risk on the wards and used it with staff from four wards. Thus, the aim of the present study was to evaluate the effect of staff education on the mortality and staff awareness of patients at risk on general wards.

2. Materials and methods

We conducted a prospective, 'before-and-after' study on one surgical and three medical wards at Herlev Hospital, a 600-bed teaching hospital at the University of Copenhagen, Denmark. The hospital had 12 intensive care/high dependency beds in the study

[☆] A Spanish translated version of the abstract of this article appears as Appendix in the final online version at doi:10.1016/j.resuscitation.2009.07.002.

* Corresponding author at: Danish Institute for Medical Simulation, Herlev Hospital, Herlev Ringvej 75, 2730 Herlev, Denmark. Tel.: +45 44883674; fax: +45 44883692.

E-mail addresses: fuhrmann@dadlnet.dk, lonfuh05@heh.regionh.dk (L. Fuhrmann), anders.perner@rh.regionh.dk (A. Perner), towikl01@heh.regionh.dk (T.W. Klausen), dooe@heh.regionh.dk (D. Østergaard), annlip01@heh.regionh.dk (A. Lippert).

Table 1

Study criteria used to identify abnormal vital signs based on criteria for calling a medical emergency team^a.

Respiratory rate <6/min or >30/min
Oxygen saturation <90% with or without supplementary oxygen therapy
Pulse rate <50/min or >130/min
Systolic blood pressure <90 mmHg or >200 mmHg

^a Criteria published by Buist et al.⁹

period, but no clinical emergency response system, except for the cardiac arrest team. The participating wards had a capacity of 120 beds used for both elective and emergency admissions. The pre-intervention data collection period was from June through July 2006, the educational intervention ran from February to June 2007 and the post-intervention data collection period was November and December 2007.

2.1. Data collection

In the data collection periods, patients at risk on the wards were identified by study personnel assessing all patients present in two wards every evening between 16:00 and 21:30. The evenings for assessing patients on the wards were planned by distributing the visits in the observational period so that all wards were visited the same number of weekdays/holidays and no wards were visited 2 days in a row. The study personnel measured vital signs (blood pressure, heart rate, oxygen saturation and respiratory rate; Table 1) in all patients present, entailing about 50 patients per evening. Patients were assigned to one of two groups: “*abnormal vital signs*” and “*normal vital signs*”.⁹ Patients who had at least one abnormal vital sign in the study period were assigned to the “*abnormal vital signs*” group and remained in the group even if their vital signs were normal on later assessments. Patients not present and patients with terminal illnesses, as pointed out by nursing staff, were not included. Staffing on the wards in the evenings was typically arranged with one senior nurse and two ward nurses or nurse assistants. If abnormal vital signs were detected in a patient, the ward nurse or nurse assistant responsible for taking the vital signs of the patient and delivering the care of the patient was asked pre-determined questions to assess if he/she had measured the vital signs of the patient and was aware that the patient was at risk (Table 2). Vital signs were not taken by staff at set times for all patients on the participating wards.

On the first occasion the study personnel measured an abnormal vital sign, depending on the nurse/nurse assistant’s answers to the questions, the patient was categorized as either “*Staff aware of the patient being at risk*” or “*Staff unaware of the patient being at risk*”. Medical students were hired as study personnel and they participated in a two-hour training programme addressing hygiene, use of the medical equipment, use of the data collection tool and how to ask nursing staff about their awareness of patients at risk. The outcome and length of stay of patients were registered from the hospital database. No interventions were made, but the nurses/nurse assistants were informed about abnormal findings and the reaction to the information was noted. There was no change during the study periods in the nursing staff’s mandate to act if a patient exhibited abnormal vital signs. All data were entered

Table 2

The predetermined questions asked to assess if the nurse was aware of a patient being at risk.

Have you measured the vital signs of this patient?
Will the vital signs that I have measured and informed you about make you take some kind of action?
If you do not want to take action in response to the vital signs that I have informed you about, what made you decide that?

into a specially designed database (Access 2002, Microsoft). Danish law exempts this type of research from ethical board approval. The National Board of Health and the Danish Data Protection Agency approved the study. All included patients gave verbal informed consent when first assessed by the study personnel.

2.2. The educational intervention

The educational intervention was developed in accordance with principles recommended by medical educators.^{10,11} It consisted of a full-day multi-professional educational programme with a focus on the recognition and management of the deteriorating patient. The educational intervention is described in detail elsewhere.¹² During the five months of intervention, the plan was to educate > 75% of medical and nursing staff.

2.3. Outcome measure

The primary outcome measure was the rate of nursing staff awareness of patients at risk in the evening during the pre- and post-intervention periods and the secondary outcome measures were 30- and 180-day mortality and length of hospital stay for patients at risk.

2.4. Statistics

This study was designed with a power of 80% and a significance level of 5% to detect a 20% relative increase in the staff awareness of patients at risk in the evening. Based on expert opinion, the awareness of patients at risk was estimated to be 75% at baseline. This resulted in a need for 113 patients at risk in each group. A single day pilot study indicated that around 5% of patients on the wards were at risk and it was estimated that new patients at risk on average would be detected every third day. Under these conditions, two-month data collection periods were chosen for both the pre- and post-intervention periods.

Categorical variables were compared using chi-square tests. Scale variables were analysed using Student’s *t*-tests with log transformations for normality if needed (e.g., length of hospital stay). A logistic regression model was used for analyses with more than one independent variable and binary dependent variables (e.g., mortality). A linear regression model with appropriate transformations for normality was used to test scale dependent variables. The Kaplan–Meier method and log-rank test were used to demonstrate differences in survival and a Cox proportional hazard model was used in analyses with more than one independent variable. Log likelihood statistics were used in the Cox regression and logistic regression model. All tests were two-sided and *p*-values less than 0.05 were considered statistically significant. SPSS version 15.0 was used for all calculations.

3. Results

A total of 690 patients were included in the pre-intervention period of the study. Of these, 561 (81%) had normal vital signs at all assessments in the study period, while 129 (19%) developed or had abnormal vital signs. A total of 873 patients were included in the post-intervention period. Of these, 718 (82%) had normal vital signs at all assessments in the study period, while 155 (18%) developed or had abnormal vital signs. Not included in the study were 403 patients in the pre-intervention period and 572 patients in the post-intervention period (*p* = 0.20) because of palliative care, lack of consent or a patient not present on the ward at the time of assessment. There were no significant differences between the pre- and post-intervention groups when adjusting for

Download English Version:

<https://daneshyari.com/en/article/3009372>

Download Persian Version:

<https://daneshyari.com/article/3009372>

[Daneshyari.com](https://daneshyari.com)