Factors affecting observations of vital signs in hospital during the night shift: nurses’ perspectives

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Acknowledgement and disclaimer

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• We would like to thank the staff who gave their time to the survey and interviews. Their willing participation on the study has provided great insight into understanding aspects of the way that vital signs observations on hospital wards are organised at night time.
## Research team

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<tr>
<th>Name</th>
<th>Organisation</th>
<th>Role in study</th>
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<tr>
<td>Paul Schmidt</td>
<td>Portsmouth Hospitals NHS Trust</td>
<td>Chief investigator</td>
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<td></td>
<td>CORG</td>
<td></td>
</tr>
<tr>
<td>Alejandra Recio-Saucedo</td>
<td>University of Southampton</td>
<td>Co-investigator / Project management</td>
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<td></td>
<td>CORG</td>
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<tr>
<td>Peter Griffiths</td>
<td>University of Southampton</td>
<td>Co-investigator</td>
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<td>CORG</td>
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<tr>
<td>Jo Hope</td>
<td>University of Southampton</td>
<td>Research Fellow</td>
</tr>
<tr>
<td>Antonello Maruotti</td>
<td>University of Southampton</td>
<td>Statistician</td>
</tr>
<tr>
<td>Greta Westwood</td>
<td>Portsmouth Hospitals NHS Trust</td>
<td>Co-investigator</td>
</tr>
<tr>
<td></td>
<td>CORG</td>
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<tr>
<td>Paul Meredith</td>
<td>Portsmouth Hospitals NHS Trust</td>
<td>Co-investigator</td>
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<td>CORG</td>
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<tr>
<td>Nicky Sayer</td>
<td>Portsmouth Hospitals NHS Trust</td>
<td>Co-investigator</td>
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<td>CORG</td>
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<tr>
<td>Yvonne Alton</td>
<td>Independent</td>
<td>PPI advisor</td>
</tr>
<tr>
<td>Carole Fogg</td>
<td>Portsmouth Hospitals NHS Trust</td>
<td>Co-investigator</td>
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<td>Gary B Smith**</td>
<td>CORG</td>
<td>Co-investigator</td>
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*CORG: Clinical Outcomes Research Group of PHT Research and Innovation Department: conducts health systems research using digital clinical data collected during routine care provision.

**Visiting member of CORG; Centre of Postgraduate Medical Research & Education (CoPMRE), The Faculty of Health and Social Sciences, Bournemouth University
Background

- Identification of physiological decline in hospitalised patients rely on timely measurement of vital signs. However, studies have indicated observations may be delayed or omitted, especially during night shifts.

- Decreased adherence to hospital policy on individualised patient vital signs monitoring schedules at night compared to day time.
The issue: differences between day/night on time observations

Quarterly report of observations in time for patients with EWS 3+: day and night
Aims

• To describe nurses and midwives knowledge, beliefs and attitudes towards vital signs monitoring during the night shift on hospital wards

• To explore association of nurse characteristics with factors relevant to the completion of vital signs observations at night as outlined in an early warning scores protocol
Methods

Design: Cross-sectional web-based survey of knowledge, beliefs and behaviours of health care staff working in general adult medical and surgical wards. Semi-structured interviews.

Participants: All registered nurses, midwives, health care support staff and student nurses who had worked at least one night shift in the previous 12 months at a 1200-bed NHS acute general Hospital Trust in England.
Analysis

We used exploratory factor analysis to:

- identify and evaluate correlation structure between the survey items

**multivariable linear mixed effects model** to:

- relate factor scores with nurse characteristics (e.g. role, experience, number of night shifts worked)

and **thematic analysis** to:

- ascertain the beliefs and attitudes of healthcare staff concerning performing vital signs observations during the night

- ascertain factors that are associated with ward level observation compliance and individual self-reported compliance
Survey

- 2900 email invitations sent; 695 surveys received: 24% overall response rate
- 497 (72%) respondents met inclusion criteria of working at least one night shift in the last 12 months

<table>
<thead>
<tr>
<th>Survey respondents</th>
<th>n (%)</th>
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<tr>
<td>Role</td>
<td></td>
</tr>
<tr>
<td>Staff nurse</td>
<td>269 (54.1)</td>
</tr>
<tr>
<td>Health Care Support Worker</td>
<td>120 (24.1)</td>
</tr>
<tr>
<td>Senior nurse/Manager</td>
<td>52 (10.5)</td>
</tr>
<tr>
<td>Student nurse</td>
<td>32 (6.5)</td>
</tr>
<tr>
<td>Midwife</td>
<td>24 (4.8)</td>
</tr>
<tr>
<td>Number of night-shifts worked in the previous 12 months</td>
<td></td>
</tr>
<tr>
<td>1 to 5</td>
<td>75 (15.1)</td>
</tr>
<tr>
<td>6 to 10</td>
<td>49 (9.9)</td>
</tr>
<tr>
<td>&gt;10</td>
<td>373 (75.1)</td>
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<tr>
<td>Night duty arrangements</td>
<td></td>
</tr>
<tr>
<td>Night shifts only</td>
<td>81 (16.3)</td>
</tr>
<tr>
<td>Occasional night shifts</td>
<td>67 (13.5)</td>
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<tr>
<td>Rotation, including nights</td>
<td>349 (70.2)</td>
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<tr>
<td>Number of wards worked night shifts on previous 12 months</td>
<td></td>
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<tr>
<td>Only 1 ward</td>
<td>241 (48.5)</td>
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<tr>
<td>More than 1 ward</td>
<td>256 (51.5)</td>
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<tr>
<td>Experience (years)</td>
<td></td>
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<tr>
<td>0-5</td>
<td>152 (30.6)</td>
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<tr>
<td>6-10</td>
<td>94 (18.9)</td>
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<tr>
<td>11-15</td>
<td>71 (12.3)</td>
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<tr>
<td>16-20</td>
<td>62 (12.5)</td>
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<tr>
<td>&gt;20</td>
<td>118 (23.7)</td>
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Results
Attitudes that may influence observations during the night shift

- Taking a set of vital signs at night is very disruptive to a patient’s sleep
- It is not possible to predict which patients will need observations at night
- Scheduled observations are more important for the patient than a good night’s sleep
- Scheduled observations are as important as other ward work at night
- Continuous observation with monitoring devices throughout the night is more disruptive than scheduled staff-led observations
- Taking observations at night is the responsibility of healthcare assistants
- Cardiorespiratory arrests are largely unpredictable events that cannot be prevented
Beliefs about work environment (staffing and workload) affecting observations

- I can complete work I have planned on time without being interrupted.
- There are enough staff on night duty to do scheduled patient observations on time.
- Too much day/twilight work is left undone for night team to pick up.
- Necessary activities that could not be completed at night are left to the early shift.
- The acuity or dependency of the patients is too high to manage.
- We have the right skill mix for the work that has to be done at night.
- We are asked to cover shortages on other wards.
Professional judgement and/or EWS protocol guiding observation decision-making

During the night observations round, I tell the patient whether s/he will be woken up during the night for scheduled observations.

I will omit scheduled observations at the request of the patient not to be woken up.

I do EWS scheduled observations on patients only when they are awake.

I will wake patients up when their EWS scheduled observations are due.

I do not wake patients up for observations unless I become concerned about them.

Observations are delegated to healthcare assistants to do.

I would challenge a colleague (nurse or healthcare assistant) if s/he did not do the scheduled observations during the night.
Beliefs of ward efficiency during the night shift

- I can expect to be challenged by the nurse in charge if observations are not done on time at night
- In general, all patients who have observations scheduled after midnight have them done
- All patients with EWS 6+ are escalated to the Hospital at night team for review
- We are very good at ensuring the patient is reviewed in a timely way by a doctor
- I would feel safe as a patient on my ward, knowing that a change in my condition will be quickly picked up by nurses and reviewed by a doctor
Associations between nurse characteristics with factors relevant to the completion of vital signs observations at night
Workload and resources

- There are enough staff on night duty to do scheduled patient observations on time
- We have the right skill mix for the work that has to be done at night
- Agency staff at night know and follow the EWS protocol
- Agency staff at night have access and know how to use VitalPAC

Factor 2: prioritisation

- Scheduled observations are more important for the patient than a good night’s sleep
- I will wake patients up when their EWS scheduled observations are due
- Taking a set of vital signs at night is very disruptive to a patient’s sleep
- I will omit scheduled observations at the request of the patient not to be woken up

Factor 3: safety culture

- I can expect to be challenged by the nurse in charge if observations are not done on time at night
- In general, all patients who have observations scheduled after midnight have them done
- All patients with EWS 6+ are escalated to the H@N team for review
- I would feel safe as a patient on my ward

Factor 4: responsibility & control

- Observations are delegated to healthcare assistants to do
- It is not possible to predict which patients will need observations at night
- Continuous observation with monitoring devices throughout the night is more disruptive than scheduled staff-led observations
- Taking observations at night is the responsibility of healthcare assistants
Factor 1: workload and resources

Associations between nurse characteristics and questions about workload and resources were not significant for most of the variables.

Midwives, staff working between 1 and 6 night shifts, nurses with 16 and 20 years experience believed workload and capacity to impact the night work, which could identify experience as an important factor, however results in the more than 20 years experience were not significant.
Factor 2: prioritisation

Student nurses and midwives reported greater inclination to prioritise observations at night.

Shift patterns were not significant in questions about prioritisation of sleep or patient preference over early warning scores to conduct observations during the night shift.

All categories of years experience were significant.
Factor 3: safety culture

Questions about completing observations for high acuity patients, escalation to hospital@night or feeling safe on the ward because of prompt monitoring and action, were significant for student nurses, staff working mostly night shifts and staff with either low or high years experience.
Factor 4: responsibility & control

Role (except for the ward manager), number of night shifts worked, and years experience were associated with perceptions of the care delivered at night. Again, the category of more than 20 years experience is not significant.
Managing night-time vital signs observations: the conflicting care work of supporting sleep and preventing deterioration.

Dr Jo Hope (on behalf of the Night Surveillance Study team)
University of Southampton, United Kingdom

Abstract
Patients' vital signs are monitored less at night, even when an early warning system (EWS) is used to measure patient acuity. Semi-structured interviews with 17 nursing staff revealed a range of hidden decision-making processes used to balance the competing care work of supporting sleep, preventing deterioration, and meeting hospital and ward demands. It is recommended that teams discuss and audit decision-making around exceptions to EWS protocols at night.

Introduction
This qualitative study forms part of a mixed methods project, the Night Surveillance Study. The project aimed to ascertain the knowledge, beliefs, choices and practices of healthcare staff concerning performing vital signs observations during the night on general medical and surgical wards, and to ascertain factors that are associated with ward level observation compliance and individual self-reported compliance.

Observations at night
Research suggests that vital signs observations are taken less often at night, even when an EWS is used [1, 2]. A systematic review of why vital signs observations were missed at any time of the day concluded that nurses use vital signs observations alongside intuition and ‘pattern recognition’ of deterioration based on experience as well as concerns raised by the patient’s family members [3]. Relationships with other health professionals, ward equipment and clinical environment were also identified as factors. No research has focused on why observations are taken less at night [2, 3] and qualitative research is needed to explore this topic [4].

Methods
Nursing staff were approached through the survey in stage one of the project. 10 staff were purposively recruited from wards with the lowest and highest quartiles of expected observations and the largest relative drop in observations at night. This was supplemented with a convenience sample of seven from wards in the middle quartiles (total n=17). The wider project took a pragmatic approach and interview data was analysed using a constant comparative method informed by grounded theory.

Results
Supporting an uninterrupted ‘shift’ of sleep was described as a key care task. Decisions about whether to measure vital signs at night involved:
- Whether a full observation set seemed ‘necessary’.
- Unnecessary observations could be those for patients with chronic conditions who always scored highly, people who had difficulty sleeping and outliers labelled ‘fit for discharge’.
- If it chime with clinical judgement (formal and ‘gut’).
- Expectations of ‘fresh observations’ at start by doctors which impacted observations that would have broken up ‘shifts’ of sleep.
- Whether it might disturb others, such as those sharing a bed or confused patients.
- Ward protocols setting observation frequency - in particularly post-op intervals, which override EWS intervals but gave the impression of high compliance with EWS.
- Hospital surveillance audits increased compliance but could damage nurses’ sense of professional autonomy.

Conclusion
Nursing staff’s attempts to balance competing care tasks with ward expectations involved hidden decision-making that could put some patients at risk of lowered monitoring at night.

Implications
- Further research should explore night monitoring variations.
- Night staff’s views on exceptions to monitoring at night should be openly discussed with the whole clinical team.

References
1. [Academic work](link)
2. [Academic work](link)
3. [Academic work](link)
4. [Academic work](link)
5. [Academic work](link)

Acknowledgements
[Short acknowledgement text]

Contact information
Jo Hope
jhope@doctors.org.uk
“The more we look at our patients, the more we monitor them, the more likely we are to catch them when they're spiking a temperature, or to catch them when they're starting to become unwell. But I think it's still, it’s difficult, particularly with haematology patients, because they tend to deteriorate so quickly, that actually, even if we had them constantly monitored, we would struggle to pick up quickly when they were ill, and by doing someone's observations every six hours you won't necessarily pick up at that time that they're actually becoming unwell.”

“Some of that decision-making as a practitioner has been removed from the equation because we're being told to do some obs at 2:45 on Mr Smith.”
Thoughts to take away

• Some staff characteristics (e.g. role, experience, and number of night shifts worked) associated with beliefs regarding completion of observations. These correlated to prioritisation strategies of care tasks (attitudes and behaviours) to conduct observations (allowing patient to sleep, informing them that they will be woken up when observations are due) and having a sense of control over the care at night (beliefs) (deterioration is sometimes unpredictable).

• Workload may influence nurses’ surveillance attitudes and behaviours (too much work to complete is left for the night shift staff)

• Missed observations may be due not only to workload and resources, but also to nurses’ role and responsibilities on the ward (observations are responsibility of the HCSW).
Thank you
References

- Hands et al “Patterns in the recording of vital signs and early warning scores: compliance with a clinical escalation protocol.” BMJ Quality & Safety 22(9) 2013: 719-726


- De Meester K et al (2013a) Impact of a standardized nurse observation protocol including MEWS after Intensive Care Unit discharge. Resuscitation; 84: 2, 184-188.


