ORIGINAL RESEARCH

Impact of professionalism in nursing on in-hospital bedside monitoring practice

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Abstract

Aim. This article reports a study exploring nursing practice of monitoring in-hospital patients including intra- and interprofessional communication and collaboration.

Background. Sub-optimal care in general in-hospital wards may lead to admission for intensive care, cardiac arrest, or sudden death. Reasons may include infrequent measurements of vital parameters, insufficient knowledge of their predictive values, and/or sub-optimal use of Medical Emergency Teams. This study was designed to improve understanding of nursing practice and to identify changes required to support nursing staff in improving standards of clinical monitoring practice and patient safety in general in-hospital wards.

Design. The study was designed as a qualitative descriptive clinical study, based on method triangulation including structured individual observations and semi-structured individual interviews.

Methods. In the spring of 2009, structured observations and semi-structured interviews of 13 nurses were carried out at a university hospital in Copenhagen, Denmark. The observational notes and interview transcriptions were analysed using content analysis.

Results. One theme (Professionalism influences nursing monitoring practice) and two sub-themes (Knowledge and skills and Involvement in clinical practice through reflections) were identified. Three categories (Decision-making, Sharing of knowledge, and Intra- and interprofessional interaction) were found to be associated with the theme, the sub-themes, and with each other.

Conclusion. Clinical monitoring practice varies considerably between nurses with different individual levels of professionalism. Future initiatives to improve patient safety by further developing professionalism among nurses need to embrace individual and organizational attributes to strengthen their practice of in-hospital patient monitoring and management.

Keywords: monitoring practice, nursing, patient safety, professionalism, vital parameters
Introduction

If not acted on by nurses and physicians, deterioration in patients’ medical conditions may result in adverse events, including unplanned admission for intensive care, cardiac arrest, and unexpected death (Hillmann et al. 2001, Buist et al. 2002). According to a review of 14 studies (Odell et al. 2009), mainly based on interviews and questionnaires, current research in the field of nursing monitoring practice is insufficient and of limited quality. However, findings indicate that nursing staff detect deterioration in patients mainly by intuitive judgements and pattern recognition. Besides those findings, little is known about rationales for clinical monitoring practice in nursing.

Simple bedside observations, including measurements of respiratory rate, blood pressure, and heart rate, have been reported to predict in-hospital patient deterioration (Goldhill & McNarry 2004, Goldhill et al. 2005, Harrison et al. 2006). Systematic clinical observation of patients in general wards, including measurements of vital parameters at least every 6–8 hours and prompt and appropriate assessments of those values seem mandatory for early detection of in-hospital deterioration (DeVita et al. 2010). Nevertheless, a Danish study has shown that such assessments are made infrequently and irregularly (Fuhrmann et al. 2008). Furthermore, care providers in general wards do not seem to recognize, or react appropriately to clinical deterioration (Hillman & The MERIT study investigators 2005), leading to sub-optimal management of patients in need of immediate and appropriate attention (McGloin et al. 2005, Harrison & The MERIT study investigators 2005).

Several studies have reported established use of MET and RRS to be associated with fewer unplanned admissions for intensive care, fewer cardiac arrests, or lower in-hospital mortality (Bellomo et al. 2003, DeVita et al. 2004, Laurens & Dwyer 2011). Nevertheless, early medical deterioration is still often left unattended and nursing staff or physicians may also hesitate or neglect to call for early help (Hillman & The MERIT study investigators 2005, Buist 2008).

Based on current understanding, two explanations may be proposed for this sub-optimal clinical practice. First, nursing staff measure vital parameters in their patients less frequently than they should (Fuhrmann et al. 2008), notwithstanding their higher age and prevalence of chronic disease, both increasing the risk for medical deterioration (Thorpe et al. 2007, Bodenheimer et al. 2009, Pai et al. 2011). Second, early warning signs are not always appropriately interpreted and acted on (McGloin et al. 1999, Massey et al. 2009). Nurses, who refrain from assessing clinical signs and vital parameters until they recognize individual patterns of clinical deterioration, do not come across deteriorating patients by repeated routine measurements (Odell et al. 2009). Many nurses still rely on their experience to alert them to deteriorating patients, not always realizing that it takes many years of clinical full-time practice to attain and develop adequate experience (Tait 2010). Hence, to improve patient safety, thorough clinical understanding of early warning signs should be considerably improved among in-hospital nursing staff.

This prospective clinical study, exploring nursing practice of monitoring potentially deteriorating patients in general surgical and medical ward setting, was designed to understand the complexity of nursing monitoring practice, including communication and collaboration, and to determine what future measures would be most appropriate to support nursing staff in augmenting patient safety.
The study

Aim

The aim of this study was to explore nursing practice of bedside monitoring in-hospital patients, including intra- and interprofessional communication and collaboration.

Design and setting

This qualitative descriptive clinical study, based on method triangulation (Patton 1999) including structured individual observations (Kristiansen & Krogstrup 1999, Polit & Beck 2004) and semi-structured individual interviews (Polit & Beck 2004, Kvale & Brinkmann 2009) of in-hospital nurses, was carried out at a 750-bed university hospital in Copenhagen, Denmark. The observations and interviews took place during 8 weeks in March and April 2009 in a hospital department setting, covering one medical ward, two surgical wards, and one combined medical and surgical ward for emergency admissions. The numbers of nurses employed in the wards ranged from ten in the emergency admission ward to 19 in one of the surgical wards. Approximately, 20 adult patients with complex and potentially serious medical or surgical conditions were taken care for in each ward and patients were frequently transferred to the intensive care unit. At the time of the study, an established in-hospital MET had been available to the wards for approximately 2 years.

Participants

During the study period, a total of 65 nurses (three males), with a median age of 35 (range 25–62) years and a median clinical experience of 3 (range 0.5–18) years, were employed in the wards together with 23 nursing assistants (one male). Fourteen female nurses, representing a wide variety with respect to age and clinical experience, were selected by their assistant matrons and asked by the main investigator (GB) to participate. One of them declined and the remaining 13 nurses were included. As we intended to study nursing monitoring practice, covering the total process of non-delegated nursing interventions (gathering and assessing information, deciding what to measure, acting, collaborating, and communicating), we decided not to include nursing assistants.

Data collection

Structured observations

Information on individual nursing practice of monitoring vital parameters was obtained over 7-hour observation periods, according to a structured observation guide (Figure 1). Ten periods of observation took place during daytime hours (7:30 am–2:30 pm) and the remaining three during afternoon and evening hours (3:30–10:30 pm). Study participants knew the main investigator as the creator and implementer of the local MET system and they were informed that she would be there to observe nursing practice. The main investigator observed the nurses throughout the working day, focusing on how each nurse collected information on her group of patients, how she prepared ward rounds, and how she collaborated and communicated with physicians and nursing staff colleagues. During those observations, the main investigator took notes according to the observation guide and notes on verbal and non-verbal communication. Those notes were immediately sorted into a categorization matrix by the main investigator (Figure 1) and later transcribed verbatim.

Semi-structured interviews

Semi-structured half-hour interviews, following an interview guide (Figure 2), were carried out in undisturbed parts of the ward immediately after each observation period. The nurses were briefed about the aim and design of the study, emphasizing that their individual experiences of hospital practice with respect to bedside observation, assessment, recording, communication, and collaboration were key elements of the study. All interviews were recorded and transcribed verbatim and the main investigator also took notes during the interviews. After each interview, the nurse was told not to mention study issues to colleagues to prevent future participants from modifying their normal patterns of clinic practice during the observation periods.

Ethical considerations

The Helsinki Declaration was followed and participants were included after oral and written informed consents had been obtained. According to Danish law, formal ethical approvals are not required for studies not involving biomedical issues. The study was approved by the head of the department and the hospital directors. Patients and their relatives were informed that nursing staff and their clinical practice were to be observed. The main investigator was obliged to intervene in case of neglect of signs of severe deterioration, which might put patients at risk.

Data analysis

Observations and interviews

Content analysis was used to derive and interpret both manifest and latent contents of the text emerging from
observational notes and transcribed interviews (Graneheim & Lundman 2004). A deductive approach was applied for analysis of the observations, using the observation guide as categorization matrix to structure relevant existing knowledge, or specific elements of the topic, into a model to be tested in a new context (Hsieh & Shannon 2005, Elo & Kyngäs 2008). An inductive approach was used for open-minded examinations of each interview text to detect relevant content complementary to the interview guide (Kondracki et al. 2002, Elo & Kyngäs 2008).

**Preconception**

A preconception of the main investigator was that the focus of the participants would be on nursing tasks closely associated with clinically relevant medical or surgical diagnostic and therapeutic procedures. This might lead to sub-optimal routine patient observation and management in wards also taking care for high-risk patients with multiple or serious medical problems. The research group handled this preconception using investigator triangulation (Patton 1999). The three co-investigators had not been employed in hospital

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**Figure 1** Observation guide.

<table>
<thead>
<tr>
<th>Issue 1: Clinical practice of observation</th>
<th>Issue 2: Clinical practice of documentation</th>
<th>Issue 3+4: Intra- and interprofessional collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>• How would you describe normal procedures in regard to measuring vital parameters in your ward?</td>
<td>• Where, in your opinion, do nursing staff record vital parameters measured in a deteriorating phase of a patient's stay?</td>
<td>• Do you, as a routine procedure, report patients' vital parameters during ward rounds?</td>
</tr>
<tr>
<td>• How do nursing staff on your ward know that a certain patient has to have his vital parameters measured and which parameters to measure?</td>
<td>• Are results of either planned or non-planned measurements always recorded?</td>
<td>• Do physicians pay attention to information about vital parameters?</td>
</tr>
<tr>
<td>• Who decides which vital parameters are measured in a patient?</td>
<td>• If no, how often do you think this might happen?</td>
<td>• How do you and your colleagues share observation tasks?</td>
</tr>
</tbody>
</table>

**Figure 2** Examples of questions from the interview guide.
wards similar to those being investigated for many years, and thus came to study data with fresh eyes.

**Rigour**

Investigator triangulation (Patton 1999) was used to improve study credibility. The text material from observations and interviews was read through several times independently by the main investigator and by a co-investigator (IP). Both investigators individually subdivided the text into meaning units, condensed meaning units, codes and proposed sub-categories. They then met to compare and discuss their findings until consensus was reached on all codes and sub-categories. A second co-investigator (KS) was then involved and the process of categorization was discussed until consensus was attained. Finally, all authors discussed the latent content of data to identify the theme and two sub-themes (Graneheim & Lundman 2004).

**Results**

**Observations and interviews**

One theme and two sub-themes, influencing three categories, were identified. All categories were associated with the theme, the sub-themes, and with each other (Figure 3).

**Professionalism influences nursing monitoring practice**

The theme of the study – Professionalism influences nursing monitoring practice – covers underlying essential core features determining the quality of nursing monitoring practice. In this study, the concept of professionalism was found to entail personal involvement in and reflection on clinical practice, knowledge, skills, and clinical experience. The observational part of the study showed that professional attitudes to the task of monitoring guide individual nurses in their clinical decision-making. Professional awareness was found to have a decisive impact on nursing monitoring practice in both observations and interviews. Nurses considered to have deeper and broader understanding of patients and of the complexity of nursing were also found to monitor their patients more thoroughly than those with less developed professional awareness:

Things have changed, because in the earlier days when reading the nursing records you would never read about a low blood pressure without also reading a comment on what had been done about it. That can actually happen nowadays! One stops and thinks: why is it so low and why has no one reacted or written what they have done. I think this happens because of the heavy workload but it is also a question of not having the experience (Nurse 5)

Nurses’ involvement in their clinical practice and the priority they gave to professional issues were both found to considerably influence clinical monitoring practice. Individual perception and understanding of medical deterioration, combined with professional knowledge and skills, were observed to be associated with monitoring of patients. The levels of knowledge and skills were found to influence both monitoring practice, decision-making, sharing of knowledge, and inter-professional collaboration. Conclusions were reported to be drawn based on professional knowledge and individual reflections:

Of course...as soon as you have some vital parameters, no matter what they are, you will always draw conclusions based on your professionalism and knowledge (Nurse 1)

![Figure 3](https://example.com)
Nevertheless, opposite attitudes towards the task of monitoring patients were also reported:

Often it (measuring vital parameters) is irrelevant and just something, you have to do (Nurse 2)

Nurses reflected on and expressed their point of view about the value of extending monitoring practice and what might be achieved by monitoring patients more closely. Such reflections indicate personal involvement in clinical practice:

If we were to measure vital parameters at night, then of course you would have to wake the patient up, but on the other hand you would be able to act in good time, so that the patient would not deteriorate (Nurse 3)

Decision-making

In both observations and interviews, individual clinical decision-making processes were found to differ considerably in the wards, despite similar local routines and guidelines. In all four wards, vital parameters were measured at 6 am and at 4–5 pm. Most measurements included body temperature, heart rate, and blood pressure. Not all patients were monitored.

Clinical practice and decision-making were found to be organized in two different ways according to either written standard care plans, or decision-making by individual nurses regardless of their clinical experience. Decision-making was certainly found to be influenced by clinical knowledge of individual patients and their previous vital signs, but also by the clinical workload:

We try as much as possible, both during daytime hours and during the evening shift, to screen out the vital parameters. We try to judge if there is anyone whose vital parameters we do not have to measure ...in that way we try to ease the workload (Nurse 4)

Vital parameters were found to be measured once or twice, but never three times, a day. The respiratory rate was never measured as a routine procedure and physicians were reported seldom or never to ask for it. Nursing assistants often carried out planned tasks of measuring vital parameters and briefed the nurses when worried by their findings. Participants reported that the individual level of nursing experience is important for how nurses observe patients, assess their observations, and pay attention to further observations and actions. Accordingly, nurses with intermediate or long experience (Table 1) were observed to carry out, record, assess, and act on their bedside measurements in a more appropriate manner:

The more experienced nurses observe more things and say things which make the physicians ask clarifying questions and act more, because the experienced nurse notices things I don’t see or don’t find important (Nurse 4)

The same nurses were also aware of values of combining measured values of vital parameters with clinical observations to earlier detect patient deterioration:

If I find a patient who suddenly feels warm and I measure his temperature and it is 39.1°C, then I’ll also measure his blood pressure and pulse to see if he is becoming septic. Because it all fits together in a package, doesn’t it (Nurse 5)

Other nurses made similar reflections. However, some were found to measure only vital parameters closely associated with specific clinical signs while neglecting others. Worrying about patients’ clinical conditions was also reported to make nurses measure vital parameters before calling the physician, knowing that the physician would ask for that piece of information. However, not all nurses were familiar with the value of knowing vital parameters in all their patients:

Maybe these vital parameters aren’t of any use, but at least I have measured them (Nurse 2)

Sharing of knowledge

Nurses looked for recent information on vital parameters in patient charts at the start of each working shift. They argued that they used this routine to become familiar with the basic physical state of each patient and to be well prepared for the ward round. Other nurses did so to find out if values of vital parameters of their patients deviated from what would be expected taking into consideration common routines, such as surgical procedures or epidural lines:

I use them (measured and recorded vital parameters) to see if they are normal or if they deviate from what is expected. They might not be quite normal, but a patient having an epidural line is expected to have a low blood pressure and then it is still within the ‘normal area’ that I can accept (Nurse 7)

| Table 1 Median clinical experience and age of participants. |
|-----------------|-----------------|-----------------|
| Experience      | Median years of experience (range) | Median age, years (range) | Number of nurses |
| Short           | 2.0 (0.8–2.5)   | 27 (25–29)      | 5               |
| Intermediate    | 4.5 (3.0–6.5)   | 30 (28–33)      | 4               |
| Long            | 19 (16–30)      | 46.5 (43–54)    | 4               |

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Apart from body temperature, vital parameters were only occasionally reported by nurses or requested by physicians during ward rounds. There was neither considered to be need nor time for sharing values of normal, or presumably normal, vital parameters:

The physician expects us to report all abnormal things... and that includes all kinds of things. When we train new nurses we train them not to mention everything that is normal. The physician expects things to be normal. On the other hand one must of course remember to mention everything abnormal, including vital parameters. Well, vital parameters that deviate from what one can expect, not just from the level, which is normal for this patient. We do not mention things that you can expect to occur, because if we did we would never finish the ward round (Nurse 7)

Overview charts showed which patients were to have their vital parameters measured. Nursing assistants often carried out tasks of measuring scheduled vital parameters and were found to always record their individual routine measurements in the nursing observation charts during each working shift. In the interviews, all participants strongly emphasized that they record all non-scheduled measurements made in deteriorating patients.

Specific text markings or verbal messages from colleagues were used to alert nurses for patients at particular risk of deterioration. Some nurses also reported use of special codes to indicate whether vital parameters were normal or not. Nevertheless, no nurses were able to recall discussions or instructions on how to decide which vital parameters are to be considered abnormal, or on how to deal with them. In that respect, they relied on their professional experience and basic nursing training.

Intra- and interprofessional interactions

Collaboration between nurses and physicians was observed and reported to be characterized by professional involvement. Both professions gave priority to clinically relevant matters during ward rounds. There were different opinions on collaboration in deteriorating patients. Some nurses had the impression that individual clinical deterioration had to be quite severe to make physicians respond rapidly:

They are often very busy. But if I emphasize that this is a kind of an emergency and that I would very much like some one to get over here now, then they usually come. But you really have to emphasize that it has to be now. Otherwise they are always in the middle of something else (Nurse 2)

By contrast, others said that, whenever they needed medical assistance, it would always be close at hand:

I think that the physicians are very good at getting here if we express ourselves clearly. Well, one has to be clear in speech when calling a physician in order to make them respond (Nurse 5)

Some physicians were reported to require a complete clinical description of the patient, including values of their vital parameters, to attend, whereas others were reported to attend just by the nurse being worried. Younger and less experienced nurses were less willing to give their personal opinions to the physicians, whereas more experienced ones would provide more input, taking more active part in medical decision-making and proposing clinical measures to be taken. All participants were found to expect physicians to listen to them and take them seriously. Mutual acknowledgements of clinical skills and professional judgements were frequent characteristics of the interaction between nurses and physicians, but the opposite was also observed. Many physicians acknowledged the work of the nurses and appreciated their observations and individual reflections:

Most physicians, roughly speaking, are very good at listening to our observations and pay attention to them (Nurse 4)

However, opposite opinions were also observed and expressed:

Sometimes if I call the junior physician during a nightshift my concern for the patient is not taken seriously. This really happens! (Nurse 6)

The number of available physicians and the time scheduled for ward rounds were both found to limit interprofessional collaboration and discussions on clinical and measurable bedside observations and potential actions.

Discussion

An important finding of this study is that the clinical practice of monitoring vital parameters in a hospital setting varies considerably between nurses due to their different levels of professionalism. Professionalism was found to be characterized by personal involvement in and reflections on clinical practice, knowledge, skills, and clinical experience. For almost a century by now, the concept of professionalism has been reported by researchers to reflect knowledge, intellectual and individual responsibility, autonomy, and collaboration (Flexner 1915, Ballou 1998, Havens & Aiken 1999, Mark et al. 2003). However, when further investigated in the late sixties in some occupational areas, including nursing, professionalism was also proposed to be associated with the following five dimensions:
Using the professional organization as a major referent; Belief in public service; Belief in self-regulation; Sense of calling to the field; and Autonomy (Hall 1968). In the early seventies, Hall’s five dimensions were slightly modified by Snizek (1972). The definitions by Hall and Snizek have frequently been used in nursing research (Hampton & Hampton 2000, Kim-Godwin et al. 2010). Our findings are in close agreement with the characteristics originally suggested by Flexner (1915) and later confirmed by Ballou (1998), Havens and Aiken (1999) and Mark et al. (2003). The findings of our study are merely descriptions of characteristics rather than a precise definition of professionalism. Recently, professionalism in nursing has also been proposed to be associated with nurses’ feelings of job satisfaction and with the working environment (Mark et al. 2003, Hwang et al. 2009). Previously, higher nurse-to-patient ratios (Kane et al. 2007) and higher educational levels of nursing staff (Van Den Heede et al. 2009) have been reported to be associated with better patient outcome. So far, professionalism has not been reported to significantly influence patient outcome (Mark et al. 2003), but the complexity of professionalism in nursing would make such evaluations most difficult to carry out and interpret. Nevertheless, it does not seem impossible to evaluate single components of this complex concept with respect to in-hospital patient morbidity and mortality, considering that our study actually indicates that the level of professionalism in nursing – with respect to regular and frequent follow-up measurements, prompt and appropriate action, and sharing of relevant knowledge with physicians – might influence patient safety by earlier prevention of clinical deterioration.

We identified components of nursing monitoring practice associated with theoretical knowledge. How well nurses realize the potential use and predictive value of assembled vital signs is likely to be influenced by their level of knowledge. At times, insufficient clinical knowledge might be presumed to have prevented nurses from reacting appropriately to potential deterioration in patients.

We found that decision-making, on how and when to monitor patients and on how to respond to abnormal vital signs, is also influenced by the clinical workload. This is in agreement with previous reports (Hall 1968, Baumann & Kolotylo 2009), even proposing professionalism to be strongly connected with the working environment defined as contextual and organizational attributes, e.g. workload and business (Baumann & Kolotylo 2009). We should be aware that a combination of heavy workload and insufficient clinical knowledge may result in nurses abandoning bedside measurements, hence delaying bedside recognition of medical deterioration. This further emphasizes future needs for more systematic routine observation and bedside assessments of vital parameters.

For various reasons, only obviously important details of clinical bedside signs were regularly reported and discussed during ward rounds. Not all nurses have the individual experience, or the theoretical and clinical knowledge, to realize what pieces of clinical information to share with physicians. Crucial information on patients may not be shared with physicians and ongoing deterioration may remain undiscovered (Harrison et al. 2006). Similar conclusions were drawn in a review by Odell et al. (2009). In their review, they discuss nurses’ struggle to detect deteriorating in-hospital patients in an everyday world characterized by professional inexperience and lack of skills among medical staff.

Potential patient safety risks could have been embedded in our findings. The extent of inter-professional sharing of knowledge of patients’ vital parameters during ward rounds largely depends on judgements by nursing staff on whether vital parameters are severely deviating (i.e. making them necessary to report) or not. This finding and reflection on its impact could also be viewed in the light of collaboration with physicians – another main characteristic of professionalism in nursing (Flexner 1915, Ballou 1998, Havens & Aiken 1999, Mark et al. 2003). According to our findings, interprofessional interaction and collaboration might either increase or decrease patient safety, much depending on whether or not nurses feel that they are being respected and relied on by their physician collaborators. We found, that when nurses consider themselves as being listened to and appreciated for their work by physicians, this leads to deeper interprofessional clinical dialogues. However, if nurses feel that physicians do not pay enough attention to their observations, the risk increases that important patient information never reaches the physicians. Other researchers have reported that nurses may find it difficult to report to physicians their non-quantifiable concerns about the clinical state of patients because physicians request measurable signs of physiological deterioration (Andrews & Waterman 2005). In contrast, we found that physicians, without knowing how nurses interpret their clinical findings, do not regularly ask for bedside information on individual values of vital parameters.

We also found that nurses seldom measure the respiratory rate of patients. This result is in agreement with previous findings in British and Australian hospital settings (McBride et al. 2005, Duff 2007, Odell et al. 2007). Abnormal respiratory rate might be a reliable clinical predictor of potentially serious deterioration, calling for
immediate intensive care and sometimes even preceding cardiac arrest (Cretikos et al. 2008). Nevertheless, in many countries, respiratory rate remains the least recorded of the common vital signs, including heart rate, blood pressure, and temperature (Cretikos et al. 2008). However, in the past, nurses were taught the value of respiratory rate measurement, but this knowledge is at risk of being lost. This, together with the assumption that the relatively new knowledge about the predictive value of abnormal respiratory rate is not yet basic professional knowledge to nursing staff (McBride et al. 2005, Duff 2007), may explain why this vital parameter is least recorded. Both types of knowledge gaps may affect nurses’ management of deteriorating patients.

Study limitations and strengths

We consider the use of investigator triangulation, promoting valuable discussions between co-investigators, to have enhanced study credibility by having optimized the categorization of data and hence provided more reliable results.

What is already known about this topic

- Nurses rely on their experience to detect deterioration in in-hospital patients.
- Nurses and physicians observe in-hospital patients and measure their vital parameters, but may still deliver sub-optimal care and treatment.
- Vital parameters are measured at long and irregular intervals.

What this paper adds

- Clinical practice of in-hospital patient monitoring and management varies considerably between nurses with different levels of professionalism.
- Nurses record their measured values of vital parameters, but share few of them with physician collaborators.
- Different levels of professionalism in nursing might influence patient safety.

Implications for practice and/or policy

- Future initiatives to improve patient safety should address issues of both professionalism and the working environment.
- Research in this field should involve effects of complex interventions, taking relevant attributes of professionalism into consideration.

The two study methods (observation and interview) were chosen to complement each other and to explore discrepancies between what could actually be observed and what was reported, with respect to individual nursing practice (Patton 1999).

A purposeful sampling strategy was used to include a broad variety of participants. Although the assistant matrons chose participants without knowing the aim of the study, they may still have chosen more skilled nurses with higher levels of professionalism. On the other hand, to secure transferability, it was considered important to include participants familiar with the main topic of the study and capable of expressing their opinions (Graneheim & Lundman 2004). We did not include male nurses, because it might have been difficult to maintain their anonymity, as they comprised less than 5% of the total number of nurses in the four hospital wards.

The reliability of our findings is strengthened by the fact that each participant was observed and interviewed on the same day and by the same investigator and that all information was obtained in an 8-week period. We hence consider the clinical practice of bedside monitoring to be less likely to have changed significantly during the study period. We conclude from both observational and interview parts of this study that nurses and nursing assistants in these hospital wards record all of their measured values of vital parameters. This important finding also implies that future retrospective studies, based on information recorded in patient charts, in this setting would probably reflect what has actually been measured. Having access to a MET – as for the hospital wards evaluated here – has recently been shown to promote regular and reliable in-hospital recordings of vital parameters by nursing staff (Chen et al. 2009).

Conclusion

Individual levels of professionalism in nursing may affect clinical practice of bedside monitoring and hence (by delaying recognition and appropriate management of clinical deterioration) also patient safety. National, regional, and local initiatives are required at both individual and organizational levels to support and further develop professionalism in nursing, and to enhance in-hospital patient safety. Nurses need to involve themselves in education to improve their knowledge and skills, whereas employers are to be held responsible for providing facilities for learning and training. However, educational measures alone have not yet been shown to influence patient survival (Fuhrmann et al. 2009). Considering the impact of professionalism on nursing monitoring practice, we suggest that formal
education is supported by provision of an improved working environment enabling reflection on clinical practice as an essential and natural part of daily work.

Moreover, successful support of professionalism by changes in monitoring practice depends on how organizations implement new research findings into clinical practice. Future studies in this field should primarily be designed to evaluate the impact of improved clinical monitoring and management of in-hospital patients.

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Conflicts of interest

No conflict of interest has been declared by the authors.

Author contributions

All authors meet at least one of the following criteria (recommended by the ICMJE: http://www.icmje.org/ethical_1author.html) and have agreed on the final version:

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data.
- drafting the article or revising it critically for important intellectual content

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