

Interventions used by surgical ward nurses when worried, based on professional intuition, about a patient's clinical condition

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Abstract

Background: The early recognition and treatment of deteriorating patients in surgical wards constitute a key task of nurses in daily practice. Nurses often recognise deteriorating patients through professional intuition. Nurses may use vital signs to confirm their concerns about the patients' clinical condition but whether further interventions are undertaken remains unclear. Exploring interventions used by nurses could lead to determining which interventions improve the quality of care of deteriorating patients and thereby contribute to the prevention of unplanned admissions to the intensive care unit.

Objective: To explore interventions used by surgical ward nurses when worried, based on professional intuition, about a patient's clinical condition.

Method: Data were collected through semi-structured interviews. Nurses were selected using purposive sampling and maximum variation. Interviews were transcribed verbatim and analysed using inductive content analysis (Atlas.ti). A member check of the preliminary analysis was performed.

Results: Twelve nurses of two teaching hospitals were interviewed. From the interviews five phases emerged: nurses first attempts to obtain an overview of the patient, after which they would decide whether or not to call for medical assistance. Subsequently nurses monitored the patient for changes and made a further assessment of the patient. To ensure continuity, nurses reported orally and in writing about their observations and interventions. When vital signs deviated nurses acted accordingly. In addition, influencing factors on the judgement of nurses in these phases were identified.

Conclusion: The findings of this study show that surgical ward nurses use a variety of interventions when worried about a patient's clinical condition based on professional intuition and these interventions seem to follow five phases.

Recommendations: The interventions should be further explored to determine to what degree these interventions contribute to the quality of care of deteriorating patients.

Keywords: interventions, professional intuition, nursing, clinical deterioration, surgical wards

Samenvatting

Achtergrond: De vroege herkenning van vitaal bedreigde patiënten op chirurgische afdelingen is een kerntaak van verpleegkundigen in de dagelijkse praktijk. Verpleegkundigen herkennen vitaal bedreigde patiënten meestal op basis van professionele intuïtie. Verpleegkundigen kunnen vitale functies gebruiken om hun zorgen te bevestigen maar of verdere interventies worden ingezet is onduidelijk. Onderzoek naar interventies die door verpleegkundigen worden toegepast, kan leiden tot het vaststellen welke interventies de kwaliteit van zorg voor deze patiënten verbeteren en bijdragen tot de preventie van ongeplande opnames op de intensive care.

Doel: Het exploreren van interventies toegepast door chirurgie verpleegkundigen wanneer zij zich zorgen maken, op basis van professionele intuïtie, over de klinische conditie van een patiënt.

Methode: Data werd verzameld middels semigestructureerde interviews. Verpleegkundigen werden geselecteerd door doelgerichte steekproef en maximale variatie. Interviews zijn getranscribeerd en geanalyseerd door middel van inductieve content analyse (Atlas.ti). Een member check van de voorlopige analyse werd uitgevoerd.

Resultaten: Twaalf verpleegkundigen van twee perifere ziekenhuizen zijn geïnterviewd. Vijf fases kwamen naar voren uit de interviews: verpleegkundigen proberen eerst een beeld te krijgen van de patiënt, waarna ze besluiten of ze een arts bellen. Vervolgens monitoren de verpleegkundigen de patiënt voor veranderingen en onderzoeken de patiënt verder. Om continuïteit te waarborgen, rapporteren verpleegkundigen hun observaties en interventies en dragen deze mondeling over. Als vitale functies afwijken, handelen verpleegkundigen hiernaar. Daarnaast zijn beïnvloedende factoren op het besluitvormingsproces van verpleegkundigen geïdentificeerd.

Conclusie: De resultaten laten zien dat chirurgische verpleegkundigen verschillende interventies gebruiken als ze zich zorgen maken om een patiënt op basis van hun professionele intuïtie en dat deze interventies een aantal fases volgen.

Aanbevelingen: De interventies moeten verder onderzocht worden om te bepalen in welke mate ze bijdragen aan kwaliteit van zorg van vitaal bedreigde patiënten.

Trefwoorden: interventies, professionele intuïtie, verpleegkunde, klinische achteruitgang, chirurgie

Introduction

Every year approximately 80.000 adult patients are admitted to an intensive care unit (ICU) in the Netherlands¹⁻³. The early recognition and treatment in response to the physiological instability of patients in hospital wards might prevent further deterioration and prevent unplanned admissions to an ICU, unexpected deaths or cardiac arrests^{4, 5}. The early recognition of deteriorating patients on hospital wards is a key task of nurses in daily practice⁶⁻⁸. Compared to other healthcare professionals, nurses have the most consistent direct contact with patients. Therefore, nurses are in a strong position to detect changes in a patient's health condition⁹.

Rapid response systems (RRSs) have been implemented since 2008 in hospitals in the Netherlands to improve care for clinical deteriorating patients based on warning signs of physiological instability^{6, 8, 10, 11}. RRSs consist of trigger and tracker warning systems (TTs), a rapid response team (RRT) and an evaluation and feedback component⁶. TTs help nurses in the early recognition of deteriorating patients through the use of routine observations of vital signs. Respiratory rate, oxygen saturation, administration of oxygen, heart rate, blood pressure, body temperature and level of consciousness are vital signs often included in TTs^{6, 12, 13}. If one or more vital signs reach predetermined criteria, an action is required (e.g., call for assistance of the physician on duty, who can active the RRT)⁶. Based on TTs, patients showing deviating vital signs are recognised and treated.

However, in daily practice nurses often recognise deteriorating patients through professional intuition, a feeling that can precede the occurrence of deviating vital signs^{7, 9}. Intuition can be defined as a judgement without a rationale, a direct apprehension and response, without recourse to calculative rationality¹⁴. In nursing, professional intuition includes knowing the patient and recognising changes in behaviour or physical signs, and recognising deviations from the normal clinical course⁷. Professional intuition might be incorporated in the previously described TTs in the form of a criterion called 'being worried about a patient' (in Dutch: *niet-pluis gevoel*)^{4, 5, 12, 15-17}. Adding the criterion 'worry' to TTs provides an opportunity for nurses to call for medical assistance when their professional intuition tells them something is wrong with the patient, even when vital signs do not deviate¹⁰.

Nevertheless, a recent study in surgical wards showed, despite the possibility for nurses to act upon their feeling of worry, nurses did not always call for assistance based on their professional intuition¹⁸. Rather, nurses called for medical assistance in 10-45% of cases when worried about a patient's clinical condition¹⁸. One reason could be that physicians prefer quantitative data upon which to base their decisions¹⁹. A patient's vital signs being normal could make it hard for nurses to call for medical assistance. It is unclear whether the nurse-physician collaboration in medical and surgical disciplines are the same, and there is no clear

difference between medical or surgical wards regarding the number of unplanned ICU admissions or RRT calls²⁰⁻²³. Surgical ward nurses could use other interventions, possibly subconsciously, when worried about a patient's clinical condition to prevent (further) deterioration of the patient, but knowledge about these interventions is limited. An intervention is any treatment based on clinical judgement and knowledge that nurses perform to improve patient outcomes²⁴. Nurses may use vital signs to confirm their concerns about a patient's clinical condition, but whether further assessment of the patient is done remains unclear⁷. To gain insight into interventions used by surgical ward nurses when worried about a patient's clinical condition, these interventions should be explored in more depth. Exploring these interventions could lead to determining which interventions improve the quality of care of deteriorating patients and could be taught to young professionals. Thus contributing to the prevention of unplanned ICU admissions and unexpected deaths.

Objective

To explore interventions used by surgical ward nurses when worried, based on professional intuition, about a patient's clinical condition.

Method

Design

A generic qualitative design was chosen. Minimal knowledge was available concerning nurses' interventions when worried about a patient's clinical condition based on professional intuition, for which an explorative design was needed. In addition, this study intended to reach a description of interventions reported by nurses and the reason why nurses use them— a description that stayed close to the participants' own language. A generic qualitative design provided for these elements²⁵⁻²⁸. The study was reported based on the consolidated criteria for reporting qualitative research²⁹.

Setting and participants

The study was performed in four surgical wards of two general teaching hospitals. The study population consisted of registered nurses working with adult patients (>18 years of age). The surgical wards included general surgery, vascular surgery, urology and orthopaedics. Because of the different specialties within these wards, the sample of nurses had a broad range of experiences with and perspectives of deteriorating patients. Nurses were eligible if they met the following inclusion criteria: a) working as a nurse in direct contact with adult patients, b) a minimum of two years of work experience in a hospital, c) working a minimum of one year in the surgical ward and d) being able to speak and understand Dutch fluently. There were no

exclusion criteria. The inclusion criterion of two years of work experience was chosen because nurses recognise a specific situation, such as deteriorating patients, based on experiences, which is needed in order to develop professional intuition¹⁴.

Nurses were recruited purposively through maximum variation in age, years of work experience and educational level. The principal researcher consulted with the department heads of the surgical wards regarding participation in the study. After agreeing to participate, department heads approached eligible nurses and the researcher subsequently received names of nurses willing to participate. These nurses were sent an information letter and written informed consent was obtained for all participants.

Data collection

Data were collected through semi-structured interviews using a topic list. The topic list started with the question whether nurses had ever experienced being worried about a patient based on professional intuition. Subsequently nurses were invited to give an example from their own experience, and based on this example further questions were asked. A distinction was made in the interview between being worried about a patient's clinical condition and whether or not deviating vital signs were present, because literature showed vital signs of patients influence the actions of nurses¹⁸. The topic list also contained possible areas of nursing care in which interventions could take place. The topic list was established based on literature⁷ and in consultation with an expert (GD), a nurse researcher with a PhD in this subject.

Interviews were conducted by the principal researcher, a female nurse on a medical ward and a student researcher, who is novice regarding qualitative research. Prior to data collection, two pilot interviews were held to test the topic list on clarity of questions and as preparation for conducting interviews for the principal researcher. Based on the pilot interviews, the initial question of the topic list, as described above, was made final and an explanation of what was meant by being worried based on professional intuition was added at the beginning of the interview. Interviews were held in a separate office nearby the ward where the participants worked. Interviews were audio-taped and transcribed verbatim. After each interview field notes were taken. Demographic data were noted on case report forms.

To strengthen trustworthiness, the preliminary analysis of all interviews was sent to each participant by e-mail as a member check. Participants had three weeks to indicate whether they agreed with the findings and send comments via e-mail. The subject, being worried based

on professional intuition, is not a sensitive subject and therefore was not expected to change over time^{30, 31}.

Data analysis

Data were analysed using inductive content analysis. A content analysis provided the opportunity for new knowledge and insights through making replicable and valid inferences from data to their context³². Content analysis remains as close as possible to the original meanings and context. An inductive approach was chosen because minimal knowledge was available in advance and no theory was tested³³. Content analysis consists of four stages: decontextualisation and recontextualisation, where meaning units were formed and coded, categorisation, where categories were identified and compilation, where categories were elaborated^{33, 34}. Responses of the member check are presented descriptively whether nurses agreed with the findings.

Data were analysed using Atlas.ti (version 8.3.20.0; Scientific Software Development GmbH Berlin). To enhance validity of the study, the first two stages were carried out by two researchers (LB and GD or MvdH) independently and a consensus was sought between the researchers. The third and fourth stages were performed by the principal researcher (LB), after which a consensus was reached with a second researcher (MvdH). In addition, the composed themes were peer reviewed by GD. During each stage, the analysis was supervised by a senior researcher (GH).

Ethical consideration

The study was conducted according to the principles of the Declaration of Helsinki (version 2013)³⁵, the General Data Protection Regulation³⁶ and followed the guidelines of Good Clinical Practice³⁷. The study does not fall under the scope of the Medical Research Involving Human Subjects Act³⁸. The study was approved by the local review committee of the participating hospitals. Data were stored on the research account of the university hospital of the senior researcher, of which each day an automatic back-up was made. Data were stored for fifteen years.

Findings

A total of 12 nurses participated. Most nurses were female (91.7%) and 50% of nurses had a bachelor's degree (table 1). The median age was 30.5 years (range: 22-60) and the median years of work experience on surgical wards was 6.25 years (range: 1.25-30). Most nurses

worked all shifts (83.3%). Interviews lasted between 19 and 39 minutes (median: 30.5). One nurse respondent to the member check and agreed with the findings.

- Insert table 1

Nurses indicated they felt worried about a patient's clinical condition based on various observations, such as abdominal pain or restlessness. These observations indicated to nurses that something was wrong, and they were concerned the patient might (further) deteriorate. Interventions used by nurses in these situations showed the following phases: initially nurses *tried to obtain an overview of the patient*, after which they decided whether they called for medical assistance, subsequently nurses *monitored the patient*, made a *further assessment of the patient* and *ensured continuity of care*. During these phases, nurses could come across *deviating vital signs*. In addition, *influencing factors* on the judgement of nurses in these phases were identified. Figure 1 shows how the phases are related.

- Insert figure 1

Obtaining an overview of the patient

Nurses started by applying a number of initial interventions to obtain an overview of the patient. They checked vital signs of the patient, looked at urine production and checked blood sugar levels. Nurses also asked the patient how he/she felt, paid attention to the operating area and observed the patient for indications such as perspiration, paleness and restlessness.

'At some point I did tick off a whole list in my head.' (respondent 5)

If nurses had had previous experience with the patient, the current condition was compared to the earlier situation (baseline observation) in order to detect change. Furthermore, nurses asked a colleague for a second opinion to confirm their worry and to share responsibility of the patient. This could be a colleague who is familiar with the patient and could (also) compare, or an experienced colleague. Based on this overview of the patient, nurses determined whether they called for medical assistance at that time. When nurses called for medical assistance, they communicated their observations and vital signs and indicated they were worried about the patient's clinical condition. In addition, nurses regularly communicated their idea of the cause of the worry or relevant future interventions to the physician. Nurses tried to agree with the physician on future treatment, such as target values for vital signs.

Deviating vital signs

When vital signs deviated, nurses acted accordingly and informed a physician. Nurses also started or increased oxygen (levels) after observing a shortness of breath and/or low saturation rates or started infusions of fluids in patients with low blood pressure at their own discretion. When the situation deteriorated acutely and a physician was not available, some nurses indicated they had called the RRT themselves.

'If I check vital signs and they are deviating, then you act accordingly, so to speak.'
(respondent 4)

Monitoring the patient

After applying the initial interventions, the nurses continued to monitor the patient. Nurses regularly entered the room and asked the patients how they felt and whether something had changed. Nurses also increased the frequency of checking vital signs based on their sense of worry and clinical judgement or in agreement with the physician. In this phase, some nurses mobilised the patient.

'Continue to monitor. Yes... Come in once more often, walk in, just ask again... Checking vital signs again.' (respondent 9)

Nurses asked relatives, when present, about the impressions that the patient made on them, and informed relatives about their sense of worry. Nurses indicated relatives knew patients best and could therefore indicate if there was something different in the patients' behaviour or observations. Relatives and patients were instructed to press the nurse call button if something changed.

'Then I also discussed, ok, and what is different now or has he felt that way before, or... Yes. A spouse is someone who sees him daily, so if someone reacts in a different way, for example.' (respondent 3)

Further assessment of the patient

Nurses further investigated where the sense of worry and/or deviating observations of the patient might come from. Some nurses indicated taking the patient's file and looking for explanations in the reports of colleagues and physician, the patient's history or laboratory results.

'Take a look at the patient's history. Of course, often you know. Or you take a peek at your notes of what was mentioned. And if you did not read their file properly for a reason, just take the file.' (respondent 9)

Depending on the situation of the patient and the reason why nurses had a sense of worry, nurses also checked if the patient had sufficient intravenous access. If patients did not have an intravenous access and vital signs were normal, the nurse would consult with the physician whether the patient should be given an intravenous access. In this phase nurses would execute orders from the physician.

Based on monitoring and further assessment of the patient, nurses could decide to call (again) for medical assistance. Calling for medical assistance was seen by nurses as sharing the responsibility with the physician and sometimes pinning the responsibility on the physician. However, nurses also indicated that when it came to the care for the patient in the ward, they were still responsible.

'The responsibility lies with the physician, but yes, you are the one who remains point of contact.' (respondent 3)

Ensuring continuity of care

When nurses had a sense of worry, this was sometimes not resolved during their shift. Rather, nurses transferred the care to their colleague. In written reports, nurses often described the situation objectively by writing down their observations and the interventions applied during that shift. Nurses also stated clearly when they had called the physician and any orders given by the physician. However, nurses indicated they often did not specifically write down that they had a sense of worry. This was perceived as too subjective for a written report. Nurses indicated that the oral report was a better place for sharing their sense of worry. Nurses shared their sense of worry so colleagues would be alert with regard to the patient. They indicated to trust their colleagues in keeping an eye on the patient during the next shift.

'No, that's mainly something you report orally, because you want to write as objectively as possible (...) but I do not write 'I do not trust' the situation. Because that is a bit too subjective I think for a written report' (respondent 2)

Influencing factors

Which interventions nurses used depended on several factors according to the nurses. In assessing the situation and calling for medical assistance the experience and knowledge of the nurse played a role. Nurses indicated that because of their experience they could recognise the situation and their sense of worry was often founded. They indicated having no trouble calling for medical assistance and often felt taken seriously by the physician.

“I have seen so much now (...) no, this is really not good or there is something wrong. We just can't see what yet” (respondent 11)

Nurses with fewer years of work experience sometimes indicated they did not feel heard by the physician. Although the same interventions were used in every shift (day, evening or night), the shift did influence how some interventions were established. During the day physicians are often present in the ward and therefore are more easily accessible than during evening or night shifts. During the night shifts, nurses sometimes found it more difficult to assess the patient because they were asleep and the threshold for checking vital signs was sometimes higher. In addition, during the night shift, nurses more often informed the physician of their sense of worry when the physician came by the ward rather than by calling the physician.

Discussion

When worried about a patient's clinical condition, surgical ward nurses first apply interventions, such as measuring vital signs and asking the patient how he/she feels, in order to obtain a clear overview of the patient. Based on this overview, nurses determine whether they call for medical assistance. Subsequently, nurses keep monitoring the patient to detect change and try to figure out what is happening. To ensure continuity, nurses report orally and in writing about their observations and interventions. Influencing factors on interventions applied by nurses consist of the experience of the nurse, the physician's response and the type of shift in which the feeling occurs.

The nurses in this study used previous observations in their assessment of the patient and when applying interventions. This is consistent with the study of Hart et al.³⁹ in which nurses indicated that continuity in patientcare assignments allowed for recognition and response to subtle changes in patients' conditions. The same study showed that nurses with more knowledge and experience with deteriorating patients were better prepared to take action³⁹. This corresponds with the findings that nurses with more experience felt confident in calling for medical assistance and indicated that their sense of worry was often founded. The study of Hart et al.³⁹ also indicated that the complexity of work environment formed a challenge

during the event of a deteriorating patient. Although the type of shift could influence the interventions taken by nurses, the complexity of work environment has not emerged from the findings, possibly because the settings of the two studies were different (The Netherlands versus United States).

Iddrisu et al.⁴⁰ investigated the nurses' role in recognising and responding to clinical deterioration in surgical patients. They found that nurses indicated hypotension as the most common issue in the post-operative period, and interventions, such as initiate fluid bolus, were mainly used to anticipate hypotension. In addition, they found a clear difference between orthopaedic nurses and general surgical ward nurses in several respects⁴⁰. This is contradictory to this study in which no differences were found between nurses of different surgical specialties and nurses seemed to assess the patient more broadly and not focus on hypotension solely.

The sense of worry of the nurses and the resulting interventions were based on their professional intuition. For example nurses increased the frequency of checking vital signs based on a combination of their sense of worry and their clinical judgement of the patient. By including their clinical judgement, the nurses showed using a process of gathering and interpreting information, after which further interventions were taken, resembling the principles of situational awareness (SA). SA is a dynamic and cyclical process of receiving information, interpretation and anticipation based on this information, with the result that new information is made available⁴¹. From the moment of entering a room and observing a patient nurses receive information (e.g., restlessness), after which they interpret this observation. Knowing that this restlessness can possibly result from deterioration, they act by checking vital signs. This leads to new information that is again interpreted. This cycle continues to repeat itself continuously while monitoring the patient. This suggests that, although the sense of worry of nurses initially is not based on rationale, the interventions applied by nurses do follow a pattern.

A wide variety in participating nurses was achieved in age, years of work experience and educational level and multiple settings and surgical wards were present in this study. Furthermore no new themes emerged from the last two interviews, by which inductive thematic saturation appears to have been reached. This has enhanced the generalisability of findings in Dutch hospital settings. However the findings are not directly generalisable to other countries in which nurses have different responsibilities and tasks.

This study had a few limitations. The principal researcher was a novice researcher in the field of qualitative research. Another limitation of the study was that selection bias may have occurred due to the recruiting method. Eligible nurses were passed on to the principal researcher by the department heads, who were informed about the inclusion criteria. In addition, due to this recruiting method during the interview, it became clear three nurses did

not meet all inclusion criteria and had fewer than two years of work experience. The nurses were still included in the study because they did meet the inclusion criteria of at least one year of work experience in the surgical ward and had experienced being worried based on professional intuition. The inclusion criteria of two years of work experience was based on Benner¹⁴ from 2009. Possibly the inclusion criterion was obsolete because of the rapidly changing nature of healthcare. Furthermore, although the findings were peer reviewed, the response rate to the member check was low. This might limit the validation of the findings and should be considered in further studies to augment trustworthiness.

This study has shown interventions surgical ward nurses use when worried about a patient's clinical condition. However the effectiveness of these interventions in the care for deteriorating patients remains unclear. Further research should explore interventions used by nurses in other wards and to what extent the interventions used, contribute to a better quality of care for deteriorating patients.

The findings of this study show that surgical ward nurses use a variety of interventions when worried about a patient's clinical condition based on professional intuition. The interventions follow five phases: obtaining an overview of the patient, deviating vital signs, monitoring, further assessment of the patient and ensuring continuity. The interventions should be further explored to determine if these interventions contribute to the quality of care for deteriorating patients in hospital wards.

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Table 1. Demographic data of nurses

Age[^] (years)	30.5 (22-60)
Sex*	
- Female	11 (91.7%)
Education*	
- Bachelor	6 (50%)
- Vocational	4 (33.3%)
- In-service	2 (16.7%)
Years of workexperience[^] (total)	9 (1.25-39)
Years of workexperience[^] (surgical wards)	6.25 (1.25-30)
Hours of work per week[^]	32 (20-36)
Working all shifts*	
- Yes	10 (83.3%)

* represented as: n (%) ^ represented as: median (range)

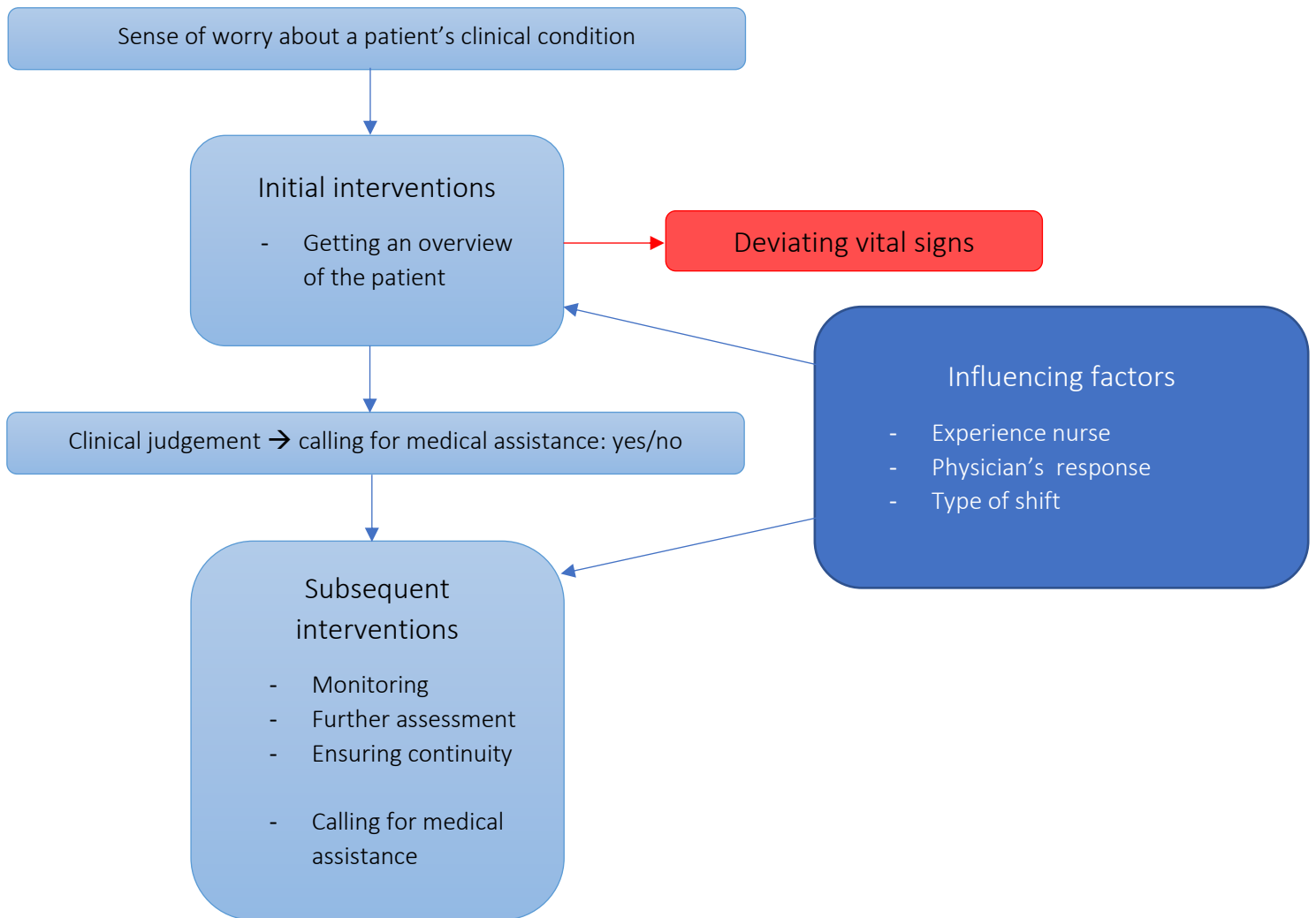


Figure 1. Model of the findings