RESEARCH ARTICLE

The experience of healthcare staff of incident reporting with respect to venous blood specimen collection practices

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ABSTRACT
Venous blood specimen collection is an important practical task that results in an analysis response that often leads to a clinical decision. Errors due to inaccurate venous blood specimen collection are frequently reported and can jeopardize patient safety because inaccurate specimens may result in a delayed or incorrect diagnosis and treatment. However, few healthcare personnel have written an error report regarding venous blood specimen collection practices. The aim of this study is to describe the experiences of healthcare personnel with incident reporting of venous blood specimen collection practices in primary health care. Our study is based on 30 individual interviews with healthcare personnel from 10 primary health care centres. Data were analysed using qualitative content analyses. Personnel experiences of incident reporting were summarized in three categories; Uncertainties in the planning and organization, High workload and low priority and, A need for support and guidance. More specifically, barriers hinder personnel in reporting mistakes. An interpretation based on the results is that surrounding circumstances within the organization influence whether personnel report mistakes or not. The result indicates a need for parallel systems, to identify and report errors or near-misses to prevent mistakes. Processed incidents should be returned promptly to the personnel to use as a learning experience. Having a valid questionnaire and a key person to write an incident report, might reduce the burden on the health care staff and increase the numbers of incident reports and patient safety.

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Introduction
Venous blood specimen collection (VBSC) is frequently performed and is an important procedure in healthcare. Analyses results following a blood specimen collection are often essential for diagnosis and treatment and influence clinical decisions (Plebani, 2012; Simundic, 2014). VBSC mistakes can, for example, occur at patient identification or during the sampling process (Bölenius et al., 2013; Söderberg, Wallin, Grankvist, & Brulin, 2010; Wallin et al., 2010), possibly causing serious consequences for the patients, i.e. delayed or incorrect treatment and diagnosis (Gomez-Salgado et al., 2014; Plebani, 2012). It is difficult to understand why these mistakes occur so frequently considering two Swedish studies report that only approximately 30% of healthcare personnel have written a VBSC incident report (Söderberg, Grankvist, Brulin, & Wallin, 2009a; Wallin, 2008). Therefore, the aim of this study is to describe healthcare personnel experiences of VBSC incident reporting practices in primary health care.
Background

In the United Kingdom, 1.5 million adverse healthcare events are reported annually (Williams & Osborn, 2006). A patient safety incident in health care may be defined as an event or circumstance that could have resulted, or did result, in unnecessary harm to a patient (incident that is not accomplished according to normal procedures) (World Health Organization, 2009); therefore, the adverse event or incidents is avoidable and thus preventable. Examples include mistakes due to inadequate procedures or because of other mix-ups. However, mistakes and errors do not necessarily lead to injuries such as suffering, physical/mental injury, or illness and deaths because of inadequate health care treatment (The National Board of Health and Welfare, 2016).

In Sweden, approximately 10 per cent of all patients suffer from iatrogenic healthcare injuries. According to Swedish regulations, caregivers are obliged to inform patients when a healthcare injury occurs and report to the adverse event in the patient’s record (The National Board of Health and Welfare, 2016). Healthcare personnel are further obligated to write a report focused on what occurred. Even though incident reporting is obligatory in health care, studies indicate that few healthcare personnel complete an error report following an adverse event and many errors and shortcomings are not reported (Mitchell, Kline, Jones, & Tumlin, 2015; Nakamura, Yamashita, Tanihara, & Maeda, 2014). There are several explanations why healthcare staff choose not to report. For example, it may have to do with the processing of the incident reporting implementation, lack of education (Macharia et al., 2016), or insufficient commitment or negative attitudes to error reports (Mitchell et al., 2015). Error report consequences might arouse fear and discussions of who is at fault (Rea & Griffiths, 2016). Anonymously written error reports are more detailed (Crane et al., 2015).

Sweden lacks a national compilation of error reports. Instead, each caregiver organization has proprietary reporting systems (The National Board of Health and Welfare, 2016) meaning that each workplace has its own reporting guidelines as to what is considered an incident or adverse event. Well written error reports can contribute to patient safety by drawing attention to and identifying adverse events while identifying areas in need of improvement (Braithwaite, Wears, & Hollnagel, 2015). However, it remains a challenge for healthcare organizations to create a functional, working method to report errors and to foster a work environment that promotes reporting.

Quality efforts to improve VBSC procedures are needed to guarantee patient safety (Söderberg, Brulin, Grankvist, & Wallin, 2009b; Wallin et al., 2008; Wallin et al., 2010). It is essential that the preparedness for VBSC and VBSC procedures are performed correctly. Records show that few personnel have reported VBSC incidents (Söderberg et al., 2009a; Wallin, 2008). The lack of reporting makes it important to examine personnel experiences of incident reporting procedures of VBSC.

Aim

To describe nursing personnel experiences of incident reporting with respect to venous blood specimen collection practices in primary health care.

Method

In a previous study (Bölenius, Brulin, & Graneheim, 2014), 30 individual face-to-face interviews were performed to evaluate a VBSC educational intervention. The interviews asked questions concerning phlebotomy experiences following participation in an educational intervention programme. Questions about VBSC incident reporting were also asked. Those questions are analysed in the present study using qualitative content analysis.
Research context and participants

The research context and participants are the same as in the previous study conducted in northern Sweden (Bölenius et al., 2014). VBSC personnel from 10 public healthcare centres from one county council were included. The VBSC personnel had various working conditions; some worked in the healthcare centre laboratory units, others performed home visits, and some alternated between laboratory units and home visits. Inclusion criteria were to have had VBSC experience and to have filed at least one incident report. Interviews were conducted between September 2010 and June 2011. A total of 30 VBSC personnel gave consent to participate. The majority of the participants were women (n = 27) and they worked in urban or rural areas. The age ranged between 32–65 years (Md = 57). Participants working years ranged from 1–37 (Md = 20). Among the 30 participants, 18 were enrolled nurses, 11 were registered nurses and one, a Medical Laboratory Personnel.

Interviews

The participants were informed about the study by a postal letter. VBSC personnel were then contacted by a phone call asking them to participate. Interviews were performed by the last author (K.B.) at the participants’ workplace and during regular work hours. Before the interview started, participants were informed of the study’s aim. The interviews were open-ended with reflective elements; questions about incident reporting were asked in the last part of the interview. The interview guide addressed questions such as, Could you please tell me about your experiences of incident reporting in respect to VBSC? The VBSC personnel’s descriptions were clarified by follow-up questions such as, Tell me more about it, and Please could you give me an example of that?, and How did you feel then? The whole interview lasted between 17–44 minutes (Md = 22 minutes). Interviews were recorded and transcribed verbatim (Bölenius et al., 2014). The content concerning incident reporting consisted of 45 pages of text.

Data analysis

The text concerning incident reporting was analysed by three of the authors (KB, IP, EE) using qualitative content analysis which is a method of analysing written or verbal communication in a systematic way focusing on differences and similarities within parts of the text and resulting in categories and/or themes (Graneheim & Lundman, 2004). The analysis was performed in several steps. The texts were read through to obtain a feeling of the whole. Recordings were listened to for text validation. Texts that were not relevant to the aim of the study were excluded. The text was divided into meaning units; i.e. sentences related to each other by content. The meaning units were condensed while still preserving their core and labelled with codes. The codes were compared for differences and similarities and sorted into seven subcategories at a manifest and descriptive level. In the next step, the subcategories were abstracted and formulated as three categories. In addition, to describe the codes and categories, we also present quotes to allow the reader to judge the authenticity and internal consistency of our interpretations.

Ethical considerations

The study was approved by the Regional Ethical Review Board (Dnr 2010-355-32M, additions to Dnr 06-104M). All participants received verbal and written information about the study. Participants gave their informed consent to participate and were able to choose the time and place of the interview. Furthermore, the participants were informed that they could stop the interview at any point if they wished and they were reassured that all information would be handled confidentially, and that the participants’ identity would not be revealed in the final results (Bölenius et al., 2014).
Results

The findings of VBSC personnel experiences with incident reporting were formulated in three categories and seven sub-categories. The three categories; Uncertainties in the planning and organization, High workload and low priority, and A need for support and guidance. The categories describe the VBSC personnel experiences of possibilities and barriers to what motivates the reporting of incidents and what influences incident reporting. Categories and sub-categories are presented in Table 1.

Uncertainties in the planning and organization

The VBSC personnel reflected on uncertainties in planning and organization and described how the lack of routines within and between units could influence personnel not to report mistakes.

Lack of routines within the healthcare centre

The VBSC personnel experienced that lack of routines or a lack of adherence to routines caused the majority of the written incident reports. Most of the participants had written incident reports associated with events where they had not been personally involved in the incident. These reports concerned a variation of different situations such as; test tubes sent with too little blood, incorrect identification procedures of immigrants because the immigrants had no identification number from birth or because of linguistic deficiencies. The VBSC personnel also described situations where there were patient mix-ups or incorrectly written birth identification numbers. One example was when the physician put a handwritten label on the test tube, which according to local routines is incorrect. In these cases, personnel changed the incorrect label to a correct label or sent it with the incorrect handwritten label. The primary health care centre then received an incident report from the laboratory for a labelling error. However, the personnel considered it more dangerous to change the handwritten label to a correct label. Another example of the lack of routines was described between the VBSC personnel and the reception where patients sign up for their appointment.

Lack of routines in cooperation with other units

VBSC personnel describe a lack of routines when cooperating with other external units served by other organization. For example, one unit in the municipality was allowed to perform and deliver samples while another unit belonging to the county council served as the caregiver and was responsible to
handle the test tube, register, sign, process and then send the sample for analysis. Once any unit has dropped off the test tube to the healthcare centre, the test tube is recorded; meaning that the professionals at the healthcare centre are responsible as the official caregivers. VBSC personnel reacted negatively because they were obligated to deviate from the regulations and that this kind of incident was not reported as an error. Another lack of routines between units included the hospital ward and healthcare centres. The lack consisted of poor coordination for when the samples should be taken. For example, sometimes there was a failure to send requests from the ward to the healthcare centre leading to patients arriving at the healthcare centre, but no referral had been sent from the hospital. Conversely, samples from the healthcare centre were not forwarded to the laboratory even though the personnel had noted that the sample had been sent. Further, the lack of routines between units also included personnel from one unit (healthcare centre) waiting for analysis results but the late response from the laboratory delays the patient’s treatment. In a situation like this, according to the VBSC personnel, it was obvious to report errors.

Yes, something that you really could write an incident report on… it’s when patients come and says: “I’m supposed to get a few samples taken! Yes, what for? Personnel at the hospital ward told me to come here and take samples.” Then, you must search in the medical records, like a fool, to find an order… if there is an order… and it takes so much time, unnecessary time … and, then, there may not be an order (Interview 21).

High workload and low priority

The VBSC personnel described that a high workload could influence whether they reported incidents or not. Further, a lack of understanding of what needed to be reported was apparent when the VBSC personnel described that they did not write incidents reports for what they considered ‘small things.’

Stress and lack of time

The VBSC personnel pointed to stress and a lack of time as constraining their ability to report errors. Later, after reflection over the incident, and what had gone wrong they realized that they should have written an incident report. However, VBSC personnel expressed that it might be easier to write reports if they wrote them more often as they would get used to doing it and the time writing them may decrease. The staff members also described having a heavy workload, so it was not surprising that errors occurred and that the laboratory personnel reported errors performed by primary health care centre’s personnel.

The lack of time is, of course, too much if I say so. We have a very heavy workload and quite stressful work, so that, sure, there have been times [when personnel should report but don’t] But there will always be new errors so then, then an error report will be written in the end. when…. Within the same area of incident (Interview 11).

Lack of benefits for the patient

VBSC personnel noted few benefits to the patient arising from writing an incident report. Some events were described as trivialities and the incident that should be reported felt too insignificant and there was no benefit of reporting it. The VBSC personnel thought that serious events were important to report but not the small errors.

They want us to write a report about … large and small things, and sometimes it feels like the entire process … is so very cumbersome in relation to just a little thing … Then you would like to call and say, but you … you have done like this or, think about this next time … What is the benefit of [incident reporting] then? (Interview 17).
**A need for support and guidance**

The VBSC personnel described the need for support and guidance applicable to handling different situations and precise instructions on how to write an incident report.

**A complex system with respect to reporting**

The VBSC personnel described the reporting system as complex and complicated to understand. Within the system, they had difficulties to find the right location to write the report in. They were uncertain of how to complete an incident report and what was allowed or not allowed to be written. VBSC personnel asked for support from their manager but experienced that he/she sometimes did not have adequate knowledge to answer. Thus, the VBSC personnel experienced that no one could provide them support or a clear answer.

> For the first time [when you should write an error report] you must discover in which section [at the computer] and search through several steps before you can start writing about the incident… it takes a really long time! (Interview 12).

**Feedback as confirmation**

VBSC personnel described reporting incidents as a positive and an important task, e.g., governmental demands, to do when an incident were detected. When an incident report was submitted, confirmation was received through feedback from a manager or other colleague (locally responsible for the incident reporting system). Incident report feedback was described as guiding personnel in doing better and it felt good to get feedback about both good and bad things. The staff members desired quick feedback so they could immediately implement fixes and improve work routines. VBSC personnel found late feedback to be not meaningful. Sometimes, when feedback was received long after the reporting the incident, the VBSC personnel found themselves distanced from the incident and it was hard to recall and understand what had gone wrong at the time.

> Yes, but it's a good thing if I get feedback …. both positive and negative. It's so easy to write an error report when an incident happens, and you get timely feedback, preferably the day after…, e.g., this specimen cannot be analysed … Then I will know … The feedback should not come a year later (Interview 9).

**A feeling of failure**

VBSC personnel experienced feelings of personal failure when reporting errors and felt their failure would become part of the statistics. Embarrassment was felt for being careless and included in the statistics. Another effect of receiving negative feedback is the feeling of being singled out and accused when the feedback was given to them individually and not to the whole group.

> Yes, it is important, but sometimes you feel that this will not happen again. You also think this is embarrassing … You have been careless (Interview 6)

**Discussion**

VBSC personnel experiences of incident reporting were summarized in three categories: Uncertainties in the planning and organization, High workload and low priority and A need for support and guidance. More specifically, the results show that there are barriers that hinder personnel from reporting mistakes and their reflections describe possible solutions to support incident reporting. An interpretation based on
the results is that surrounding circumstances in the organization influence whether personnel reports mistakes or not.

**Lack of routines in cooperation with other units** were described in the interviews. For example, patients could be sent to be blood sampled at the health care centre, but when the patient arrived at the health care centre, there was no order sent from the hospital. Another example of the lack of coordinated routines between units is when one caregiver leaves a tube at the health care centre and another caregiver must record the tube. **Lack of routines within the health care centre** deals with situations where patient information is mixed up such as incorrectly typed or handwritten birth identification numbers. In these situations, when the VBSC personnel know they are unable to work according to routine, no incident report is written. A review of the causes of preventable incidents, reports that if a safety net has a weakness, such as lack of routines, the risk for an incident to occur increases (Hoffman & Rohe, 2010). Regarding venous blood sampling, most errors occur pre-analytically and occur primarily because of human errors and in relation to the system (Söderberg et al., 2009b). However, it is possible for personnel to change their routines, but leaders have a great responsibility to initiate and implement the changes at the health care centre (Grol & Grimshaw, 2003). Thus, an interpretation is that ensuring patient safety through tested and implemented routines, is imperative. There is also a need for clarity in the planning and organization of transfer of information as patient safety is jeopardized when information is not clearly tracked, and the responsibility is unclear. Routines, both within the health care centre and coordinated between units should be developed and improved (Howell et al., 2017).

In the present study, **Stress and a lack of time** were reasons that VBSC personnel were unable to report mistakes. It became evident that little time exists to write the reports. VBSC personnel recognize that an error has occurred, but due to stress and lack of time staff avoid reporting the incident or may decide to report at a later date. In line with our results, other studies agree that incidents are seldom reported because of heavy workloads, lack of experience, and high personnel mobility (Sarabia-Cobo et al., 2015; Webster & Anderson, 2002). Furthermore, the same reasons have been shown to be the most common causes of serious events (Rea & Griffiths, 2016; Vincent, Stanhope, & Crowley-Murphy, 1999). Specifically, it is reported that the workload, personnel mobility and the lack of experience need to be changed to reduce mistakes (Sarabia-Cobo et al., 2015; Webster & Anderson, 2002). Proposed changes include scheduling time for incident reporting and implementing time for discussions that lead to improved risk awareness (Rea & Griffiths, 2016). However, because time is a scarce commodity in the health care system, it is important to find a workable system that does not further burden the personnel or the health care system. Prospective observation of care situations to identify near-misses and errors is a method that have been suggested as a robust method to measure the rate of errors (Howell et al., 2017). Thus, a suggestion is to include direct feedback after observed risks, followed by discussions to increase awareness about the risk situation. In the present study, the lack of benefits to the patient and perceived trivialities are also reasons why VBSC personnel choose not to report mistakes. Personnel are less willing to write reports for minor incidents that did not have directly visible consequences (Evans et al., 2006). Similar to our results, others reported that personnel were less motivated to write reports if the incident had not led to a visible adverse event. Effective change leading to increased reporting must come from a decision to report all kinds of mistakes (Mitchell et al., 2015). In contrast to that suggestion, a system that identifies near-misses has several benefits compared to reporting all mistakes. Identifying near-misses using a valid questionnaire takes little time, allows monitoring of many personnel and reduces the burden on personnel (Bölenius et al., 2013).

Our results show that the complex reporting system reduces usability. A dissatisfaction over the system was reported. Present results describe difficulties for personnel to write the reports, navigate the reporting system, and a desire for more managerial support. These complexities contribute to few reported incidents. In contrast, another study did not conclude that an overly complex system caused the underreporting (Kingston, Evans, Smith, & Berry, 2004) and another study reported that more than 50% of participants found the report writing process to be easy (Anderson, Stumpf, & Schulkin, 2009). However,
results in a review indicate that the reporting errors will increase if the personnel are better trained to identify and report near-misses or errors (Howell et al., 2017). Further, others suggested that the reporting process should be simplified with a minimized text and a quicker feedback system (Kingston et al., 2004). These descriptions support our proposals for additional reporting systems as what is easy for one individual may be difficult for another. One suggestion could be to orally report the incident to a key person that is responsible for writing the report. Feedback as confirmation motivated incident reporting in the present study. An important aspect of a good reporting system is for it to be supportive, informative, and to include planned discussions about incidents (Rea & Griffiths, 2016). Support and confirmation from managers are cost effective measures and facilitate personnel (Sveinsdottir, Ragnarsdottir, & Blondal, 2016). Feedback from managers can lead to improved work environments. Additionally, feedback from patients has been described as important (Ivers et al., 2012). Patients are central sources when it comes to reporting problems that can be found in health care. In the present study, feelings of failure was described as a reaction to incident reporting and when VBSC personnel received negative feedback. Analogous to our results, it has been shown (Kingston et al., 2004; Rea & Griffiths, 2016) that personnel were embarrassed and described feelings of fear that their reputation could be destroyed due to the mistakes they had made. Thus, it is important to create a system that constantly strives to prevent mistakes without assigning blame (Howell et al., 2017; Nygren et al., 2013; Shanks, Bil, & Fernhout, 2015). The importance of nursing research is for personnel to gain learning opportunities and an understanding of how others work, but nowadays there is not enough time for this (Sarabia-Cobo et al., 2015). As a consensus, we believe that research and knowledge is critical to improving nursing care, changing routines, and working in a safe manner.

**Clinical Implication**

The results in the present study indicate that local routines need to be revised and improved, including routines in respect to the coordination of care between units. Moreover, it is also important to find a workable system that does not further burden the personnel or the health care system. In the light of our results, we suggest that healthcare managers and safety managers develop and use two complementary systems that can identify and prevent mistakes; one that reports active and direct mistakes and another that observe and identifies near-misses. Using a combination of these two systems could identify and prevent active and latent undetected errors, thus, improving patient safety. For example, regular screening of VBSC near-misses and errors using a valid questionnaire (Bölenius, Brulin, Grankvist, Lindkvist, & Söderberg, 2012) could figure as a complement to another incident reporting system. Also, observations of errors and risk analyses seem to be effective in improving and ensuring patient safety (Simundic et al., 2015). Another suggestion is to make incident reporting easier and have one responsible, key person, write the reports with the aim of reducing the burden on the personnel. A well-designed incident system is the basis for practical, system-based changes that improve patient safety (Webster & Anderson, 2002). In addition, such changes usually are cost effective because they lead to savings through averting damage. Both economic gains and a patient-safe system will be the result.

**Conclusion**

When healthcare personnel choose to not report mistakes it affects patient safety. The present results indicate that there are still hindrances keeping errors from being reported. This underreporting is an important issue requiring further research. The results indicate the need for an easy system to ensure that incidents are reported, processed and feedback is returned in a timely manner as a learning experience. However, there are obstacles, such as lack of routines within the organization, stress and lack of time to report using complex reporting systems. To advance, routines need to be clarified from a top-down perspective. We advocate that besides clear reporting routines, there is a need for a complementary system that can identify and prevent near-misses. A reporting system of near-misses such as a valid short and
easy to use questionnaire or observational protocol might be a solution to reduce the burden on personnel and to increase the possibility of error prevention. Furthermore, the development of such an incident reporting system can be viewed as a method development for further research.

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Disclosure statement

The authors declare that they have no competing interests.

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