Clinical education

Factors associated with nursing students' adherence to venous blood collection practice guidelines – A cross sectional study

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Abstract

Venous blood specimen collection is a common procedure that nursing students perform during pre-registration courses, and training for such collections takes place on campus as well as at clinical placements. However, levels of adherence to practice guidelines are still suboptimal among both nursing students and healthcare staff. We aimed to explore nursing students’ adherence to the Swedish national venous blood specimen collection practice guidelines regarding patient identification and test request management and how this adherence is related to clinical experience, capability beliefs, research use, and the perceived social climate in clinical contexts. A survey with a cross-sectional design was conducted among 305 nursing students at a medium-sized university in Sweden. Descriptive statistics and logistic regression were used for data analysis. The survey showed that 82% of the students adhered to patient identification guideline practices and 80% to test request management practices. Factors associated with correct patient identification procedures were semester and frequency of research use. Factors associated with correct test request management were previous healthcare work experience, semester, and capability beliefs regarding academic abilities and evidence-based practice. We conclude that there is a need to develop educational tools to train students in research use and evidence-based practice in order to enhance guideline practice adherence and improve patient safety.

1. Introduction

Venous blood specimen collection (VBSC) is a common procedure within healthcare (Phillips et al., 2011), and diagnoses, treatments, and evaluations of treatment are often based on results from blood sample analyses. Various personnel categories perform VBSC, among them registered nurses (RNs) and nursing students within education programs. University nursing program curricula to become an RN, contain both theoretical and clinical/practical education. Clinical training and education take place at the university as well as in a social context at the clinical placement (Henderson et al., 2012). The clinical placement is an integral element in the program of pre-registration nursing courses and can have a significant impact on students’ knowledge and skills, and thus such placements need to be carefully considered when planning nursing education. Our study identifies individual and educational/clinical placement factors that might impact guideline adherence to VBSC practices regarding patient identification (ID) and test request management among university nursing students.

2. Background

The VBSC in Sweden is performed at every clinical setting, and by several staff categories such as enrolled nurses, laboratory technicians, physicians, and RNs. The educational level of a Swedish RN is three years of university studies. Swedish university nursing program curricula includes VBSC as one of several practical skills, which is not always the norm in an international context. VBSC is a common procedure within healthcare, and it has been suggested that approximately 60%–70% of all decisions made about diagnosis, treatment, or the evaluation of treatment are based on results from laboratory tests (Wians, 2009). Although the level of this claim has been questioned, it is beyond doubt that laboratory medicine is essential to providing healthcare staff with pivotal information (Hallworth, 2011). The VBSC is carried out in line with national clinical practice guidelines as recommended by the healthcare authorities aiming to guide healthcare staff in the management of
healthcare procedures in order to enhance patient safety by minimizing errors. Guidelines are usually consensus statements on best available practice/evidence-based practice (EBP) in a particular area and are regarded as an indispensable part of professional quality systems (Grol and Grimshaw, 2003; WHO, 2011).

The Total Testing Process (TTP), first described by Lundberg (1981) as the “brain-to-brain loop”, includes the entire process from ordering a test to the interpretation of the test result by the ordering clinician (Hawkins, 2012; Kalra, 2004). The TTP can be divided into the pre-analytical, analytical, and post-analytical phases, and errors can occur in any of these phases. In a patient-centered approach aiming to deliver safe care, every possible defect in the TTP must be identified and dealt with. It has been demonstrated that errors from the pre-analytical phase account for the majority (46%–77.1%) of all errors observed (Goswami et al., 2010; Plebani, 2006). The errors occurring during the phlebotomist’s practical performance includes, for example, improper patient ID (Dunn and Moga, 2010), specimen mix-up (Wians, 2009), and mislabeling of test tubes (Lippi et al., 2011b). Consequences of patient ID errors include incorrect diagnosis, incorrect treatment, and failing treatment evaluation, all of which can be hazardous to the patient. In addition to unnecessary patient suffering, the cost for pre-analytical errors has been estimated to represent on average between 0.23% and 1.2% of total hospital operating costs (Green, 2013). Hence, improved quality of pre-analytical procedures is warranted (Lippi et al., 2011a) and would enhance both patient safety and healthcare economy (Beastall, 2013). Recent studies have demonstrated varying levels of adherence to VBSC practice guidelines, and laboratory technicians report higher levels of adherence to guidelines than hospital ward staff and primary healthcare center staff (Bölénius et al., 2013; Melkie et al., 2014; Söderberg et al., 2009, 2010; Wallin et al., 2010). In line with both hospital ward and primary healthcare staff, senior nursing students in their fifth and sixth semesters (out of six total) have also been shown to report decreasing levels of adherence to VBSC guidelines (Nilsson et al., 2014).

Nursing program curricula are based on research, and the education aims to promote research-based knowledge and practice. In a study by Florin et al. (2012), Swedish nursing students reported high capability beliefs regarding EBP skills, and campus education was found to support the students to a greater extent than clinical training at the CTCs were in line with the Swedish national clinical training at the CTCs were in line with the Swedish national clinical practice guidelines (CLSI, 2010).

The aim of this study was to explore nursing students’ adherence to VBSC guidelines practices regarding patient ID and test request management in association with clinical experience, capability beliefs, research use, and the impact of social climate in clinical contexts.

3. Research design

3.1. Study design and setting

This cross-sectional study is part of a larger research project focusing on pre-analytic procedures for VBSC among nursing students and phlebotomy staff in Sweden.

This survey study was conducted among students attending a campus-based nursing program at a medium-sized university in Sweden. Data were collected in June 2012. A reminder was sent to non-responders after four weeks, and a second reminder was sent after another four weeks. Prior to the survey, all participants had undergone theoretical and practical education including skill training in VBSC procedures at CTCs and during clinical placements in various healthcare settings. Both theoretical education and clinical training at the CTCs were in line with the Swedish national clinical practice guideline regarding VBSC procedures and were almost identical to the international CSLI H3-A6 VBSC guideline (CLSI, 2010).

3.2. Participants

All nursing students in the second, fourth, and sixth semester out of a total of six semesters were invited to participate in the study (N = 411). Of these, 305 completed the questionnaire (response rate 74%). The response rate was 69% for students in the second semester, 66% for those in the fourth semester, and 88% for those in the sixth semester.
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