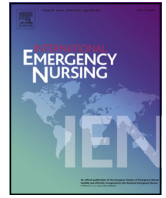




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Certification in emergency nursing associated with vital signs attitudes and practices

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ABSTRACT

Regimented vital signs (VS) assessment for all emergency patients is a common practice in many US emergency departments despite the paucity of evidence supporting its utility. Nurse attitude may be a factor that maintains this ritualized practice. Understanding the relationship between attitudes, practices, and nurse demographic factors may be the first step to challenging this ritual in order to implement evidence-based practices. A 20-item questionnaire was developed to assess emergency nurse attitudes and practices related to VS. A convenience sample of emergency nurses from the mid-Atlantic region of the United States was used. Eighty-one emergency nurses participated. Results demonstrated wide variations in VS practice and attitudes, though some strongly held attitudes are inconsistent with the literature. Certification in emergency nursing had significant associations with beliefs that nurses' clinical judgment should be the determinant for VS frequency ($p < .05$) and that triage VS are not an accurate representation of patient condition ($p < .05$). The practice of assessing the patient first and reviewing VS after was also associated with certification ($p < .05$). This study begins to address emergency nurse attitudes and practices of VS so that evidence-based changes can be implemented and further research on VS frequency conducted. It also demonstrates the relationship between specialty certification and evidence-supported attitudes and practices.

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1. Introduction

The practice of regimented vital signs (VS) (blood pressure, heart rate, respiratory rate, and many times temperature) assessment for all patients is a ritual deeply entrenched in the culture of nursing often codified in emergency department (ED) and hospital policies despite limited evidence to support the practice (Storm-Versloot et al., 2013; Zeitz and McCutcheon, 2005, 2006). VS assessment and documentation policies in the US vary by ED. Most policies specify the maximum amount of time allowable between VS assessments, frequently mandating documentation of VS every two hours on every patient, or mandate the frequency based on triage acuity level. Even when the frequency of VS assessment is not codified in

a policy, research has shown that nurses continue to perform VS assessments in pre-established, regimented patterns (Zeitz and McCutcheon, 2006). While nursing rituals serve a purpose in maintaining the culture of nursing (Philpin, 2002), these rituals are often an impediment to implementing evidence-based practice and individualized patient care (Henderson and Fletcher, 2014). Attitudes about VS are integral to nurses' practice patterns in how VS are obtained and used in clinical care (Mok et al., 2015). Time and energy are expended with prescriptive protocols for assessing, documenting, and reviewing VS despite a paucity of research to validate the benefits of applying standard frequency intervals uniformly to all patients (Yeung et al., 2012). Overreliance on VS without attention to other assessment parameters can lead to missing the more subtle cues of changes in the patient's status in advance of VS changes (Odell, 2014). A systematic review of VS research concluded that the best practice for VS frequency is one that is tailored to the patient's condition (Storm-Versloot et al., 2013).

The implementation of evidence-based VS practices may be an even more compelling issue leading to improved efficiency and effectiveness of patient monitoring (Mok et al., 2015). Without an understanding of nurses' practices and perceptions, it will be

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difficult to transform VS practices to align with this evidence. This study seeks to examine the relationship between emergency nurse VS practices, VS attitudes, and nurse demographic characteristics so that educational interventions can be developed that will effectively transform VS practice from being ritual-driven to evidence-based and patient-specific.

2. Background

VS are used by emergency nurses throughout a patient's ED visit in a variety of ways. As part of the triage process, VS parameters are just one of several indicators used to assign appropriate triage classification in the Emergency Severity Index (ESI) triage system most commonly used in the United States (Garbez et al., 2011). Studies by Johnson et al. (2012) and Miltner et al. (2014) have shown that the ESI triage classification is often the basis for clinical decision-making around frequency of VS assessments. The assumption made in these two studies is that VS assessment and nursing surveillance, the act of synthesizing all collected patient data as part of the care planning decision-making process (Kelly and Vincent, 2011), are inherently linked, yet this is not always the case (Solheim et al., 2012).

There can be a disconnect between the documentation of VS and their use in directing patient care, potentially leading to patient safety issues (Fielier et al., 2013; Watson et al., 2014). For example, automated VS documentation has been observed to have an accuracy error rate of 0%, yet reported accuracy error rates for documenting VS on paper is as high as 18.75% (Fielier et al., 2013). Additionally, research has shown that abnormal VS in the ED are associated with critical care unit admissions and inpatient morbidity and mortality rates (Barfod et al., 2012). Despite frequent VS assessment and documentation, abnormal VS sometimes go unreported during handoffs or not addressed due to the complexity of ED environments, which can have deleterious effects on patient outcomes whether discharged or admitted (Cioffi et al., 2006; Thompson et al., 2008; Venkatesh et al., 2015). Abnormal VS not addressed during an ED visit have been associated with unanticipated deaths following discharge from the emergency department (Gabayan et al., 2013; Sklar et al., 2007). While accuracy in documenting VS is of the utmost importance, having them recorded accurately does not indicate that they have been used in the care planning decision-making process.

Early warning systems (EWS) that use VS algorithms to trigger alerts, similar to those developed for inpatient use to more rapidly identify deleterious changes in patient condition, have been implemented in emergency departments with positive results (McGillicuddy et al., 2011). These systems are highly dependent on the accuracy and reliability of the VS data being entered. The accuracy and reliability of VS performed in the complex and often chaotic environment of the ED has been questioned (Edmonds et al., 2002). For some emergency patient populations, such as geriatric patients, the reliability and validity of VS can be questioned due to age-related physiologic changes (Wolf, 2007); while for others, such as trauma patients, age-based shock index and other physiological markers are better predictors of patient morbidity and mortality than morbidity and mortality prediction models that use VS alone (Bruijns et al., 2013; Salottolo et al., 2013). Additionally, nurses who have been provided education and support can identify deteriorating patients to a greater degree than EWS algorithms (Clifton et al., 2015; De Meester et al., 2013). EWS have been criticized for an overly simplistic solution to a complex problem (Yeung et al., 2012; Douglas et al., 2015; Kyriacos et al., 2011; Osborne et al., 2015), and methodological flaws in its supporting research (Storm-Versloot et al., 2013; Osborne et al., 2015).

Considering the amount of time and energy expended by emergency nursing staff members collecting and analyzing VS in the ED, there is a dearth of emergency nursing research on this topic. Only

three studies were found to be published on the topic of emergency nurse use of VS (Garbez et al., 2011; Johnson et al., 2012; Miltner et al., 2014). The research methodology used in the studies by Johnson et al. (2012) and Miltner et al. (2014) is a retrospective chart review of emergency nurse documented VS in order to investigate organizational factors that may impact the frequency of VS documentation, which does not take into account the decision-making process the nurses used in determining VS frequency. The Garbez et al. (2011) study, while descriptive in nature using survey methodology to investigate triage nurse severity score decision-making, is limited in scope to triage decision-making only. Additionally, no valid and reliable survey instrument used to investigate emergency nurse practice and attitude toward VS exists. This study seeks to begin to fill gaps in the literature on emergency nurse use and attitudes toward VS.

3. Methods

To unravel the complexity of tradition-driven VS practices, a study was undertaken to: 1) examine emergency nurses' practices and attitudes related to VS; and 2) determine if nurse characteristics, such as educational attainment, years of practice in emergency nursing, or holding certification in the specialty of emergency nursing, are associated with differences in practices and attitudes. A survey instrument was developed and tested since no instrument to measure these attributes was available at the time of the study.

3.1. Design

A descriptive cross-sectional design with a survey methodology was used to study nurses' practice and attitudes of VS.

3.2. Instrument development

Based on an extensive review of the literature and consultation with a nurse scientist, expert ED nurses, and ED physicians with research experience, a 20-item instrument was developed to elucidate emergency nurses' VS practices (11 items) and attitudes (9 items). The survey is called the Practices and Attitudes of Vital Signs Instrument for Emergency Nurses (PAVSI-EN). Individual items were constructed to cover four domains identified: reliance on VS; frequency of VS; trust in VS; and, value of VS. All 20 items were measured by a Likert scale. Practice items were captured on a 4-point scale, "never," "sometimes," "often," and "most of the time," while attitudes were evaluated using a 5-point scale from "strongly agree" to "strongly disagree" with neutral "neither" in the middle. All items were subjected to content validity testing by recognized emergency care experts. A cumulative content validity index of 0.97 was calculated, which demonstrated high content validity (Polit et al., 2007). The PAVSI-EN is a brief, easy to use survey that gauges emergency nurse perceptions as a way to inform practice guidelines and their implementation, as well as for use in research related to VS practice and attitudes (see Fig. 1 for the PAVSI-EN).

3.3. Participants and setting

A convenience sample of practicing emergency nurses from three urban emergency departments that are part of one health system was invited to participate. The largest facility was a Magnet Recognition Program® designated, level 1 trauma center emergency department in a large academic medical center. (The Magnet Recognition Program is a hospital credentialing system operated by a subsidiary of the American Nurses Association that is available worldwide. Magnet recognized hospitals have reached or surpassed pre-established evidence-based benchmarks on nursing leadership, practice, empowerment, research, and innovation.) The other two

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