

Critical care nurses' experiences of performing successful peripheral intravenous catheterization in difficult situations

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The aim of this study is to describe the experiences of critical care nurses (CCNs) when performing successful peripheral intravenous catheterization (PIVC) on adult inpatients in difficult situations. This study uses a descriptive design with a qualitative approach. Semistructured interviews were given to CCNs (n = 22) at a general central county hospital in northern Sweden. The interview text was analyzed with qualitative thematic content analysis. Three themes emerged: "releasing time and creating peace," "feeling self-confidence in the role of expert nurse," and "technical interventions promoting success." CCNs stated that apart from experience, releasing enough time is the most crucial factor for a successful PIVC. They emphasized the importance of identifying the kinds of difficulties that may occur during the procedure, for example, fragile or/and invisible veins. CCNs explained that compared to when they were newly graduated, the difference in their approach nowadays has changed to using their hands more than their eyes and that they feel comfortable with bodily palpations. To further optimize PIVC performing skills, continued possibilities to train and learn in hospital settings are necessary, even after formal education has been completed. (J Vasc Nurs 2018; ■:1-7)

INTRODUCTION

An extensive part of nursing practice is acquiring technical skills and the management of medical equipment.¹ Peripheral

intravenous catheterization (PIVC) is the most commonly used minimal invasive procedure performed throughout the world.² In many countries, including Sweden, registered nurses (RNs) are generally responsible for PIVC procedures. Approximately five million PIVCs are performed annually in Sweden at a cost of approximately four million dollars. However, many PIVCs are unsuccessful in their first attempts, as PIVC success requires competent skill performance.² In Sweden, expert nurses in the intensive care unit (ICU) and/or the anesthesia unit commonly have a supporting function that includes assisting RNs when their PIVC attempts are unsuccessful. Further research is needed to determine factors that facilitate successful PIVCs.

BACKGROUND

The topic of PIVC has been well studied with regard to various complications.^{3,4} However, research focused on performing successful PIVCs in adult inpatients is scarce, and PIVCs remain to be a challenge for many RNs.² Furthermore, additional conditions of the patients, such as obesity and/or swelling, severe disease such as diabetes, and intravenous drug abuse may complicate PIVCs.⁵ Pain, anxiety, and/or dehydration are other factors that affect vein palpability and visibility.² The definition of PIVC difficulty varies in the literature and has been assessed with various vein visibility measurement tools⁶ and patient self-reports. In addition, difficult access has been defined as two or more failed attempts.⁷ A successful PIVC has been defined as a blood return into the catheter,⁶ effectively injecting a solution in the PIVC,⁷ and patient satisfaction as an outcome.^{7,8} There are conflicting results from the literature regarding the effect of ultrasounds and other vein-visualizing systems as ultrasound techniques and performances have not

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been clearly defined by medical staff.² Nevertheless, clinical skills have an impact, and the experience of RNs has been shown to correlate with the success of PIVCs. Less experienced RNs experience fewer successes with PIVCs than RNs with more experience, and less experienced RNs need more time to successfully execute this procedure.^{2,9} Moreover, modern nursing education, although quite comprehensive, does not always prepare students well for the technical demands required to work as an RN.¹⁰ In clinical practice, a second provider is regularly employed after two failed attempts. If expert nurses attend to patients with potentially difficult vascular access, the success rate improves.² In addition to increased costs, each unsuccessful PIVC attempt causes unnecessary suffering for patients in the form of pain and discomfort. Therefore, it is essential that expert nurses are given opportunities to share their knowledge with regard to performing successful PIVCs on adult inpatients in difficult situations. In the present study, a difficult PIVC situation is defined as one during which the RNs in the ward request assistance when their PIVC attempts are unsuccessful. A difficult situation that entails a request of assistance may relate to prerequisites in the clinical setting, such as lack of time reliant on shortage of staff, or to characteristics of the patients, involving difficult access.

Aim

The aim of this study was to describe the experiences of CCNs when performing successful PIVCs on adult inpatients in difficult situations.

Context

This study was performed in a general central county hospital in northern Sweden. The hospital has one general ICU, one intra-operative unit, two postanesthesia care units, one cardiac intensive unit, one neonatal intensive unit, and several wards, for example, orthopaedic, medical, and surgical wards. The ICU treats patients who are severely ill, injured, or experiencing a threatening failure of vital functions and includes supporting staff in the wards with expert knowledge.

The CCNs have an independent support function that includes PIVC and venous blood sampling in the ward when the RNs have not succeeded. This support function is not intended to be a service feature regarding PIVC and blood sampling in the wards in general but rather should be reserved for difficult situations. When assistance is needed, the RN in the ward contacts the CCN via phone and requests this support. The PIVC support to the wards was registered during spring 2017 when the present study was carried out and comprised, on average, 31 minutes/day. A single PIVC support takes 25 minutes, on average.

METHOD

Design

This study uses a descriptive design with a qualitative approach.

Participants and procedure

Information about the study was delivered by the first author via email to all CCNs ($n = 42$) employed at the ICU. The inclusion criteria were that the CCNs had experience of assisting the RNs in the ward with difficult PIVCs and that the CCNs were willing to share their knowledge about these situations. Of these CCNs, 22 CCNs were consecutively requested to take part in the study. All CCNs ($n = 22$) chose to participate, and the interviews took place continuously. When data saturation was achieved and no new data emerged, the recruitment of CCNs was finished. Personal characteristics of the participants are presented in Table 1.

Data collection

As the aim was to describe CCNs' experiences of performing successful PIVCs on adult inpatients in difficult situations, short semistructured interviews with CCNs were performed during spring 2017. A questionnaire that comprised both open-ended and specific questions was used (Table 2). The interviews were performed by the first author, lasted between 5 and 20 minutes, and took place at the ICU. The interviews were recorded on a dictaphone and then transcribed verbatim.

Data analysis

The interview text was analyzed using qualitative thematic content analysis.^{11,12} This method presents an inductive data-driven approach characterized by a search for a pattern of a phenomenon, which in this case is difficult PIVC. Both the authors were involved in the data analysis. The transcribed interviews were read numerous times to gain a sense of the content. Text units were then identified according to the aim, condensed, and then coded and sorted into categories related to their content. The categorization was realized step by step by merging categories with similar pattern of content to new and broader categories. Finally, categories that were related to each other were subsumed into three descriptive themes, regarding the aim of describing CCNs' experiences of performing successful PIVCs on adult inpatients in difficult situations. According to Graneheim et al.,¹² descriptive themes comprise explicit expressions, that is, "the red thread" of what participants discuss.

TABLE 1

CHARACTERISTICS OF THE PARTICIPANTS

| Characteristics | CCNs, $N = 22$ |
|-----------------|----------------|
| Gender, n | |
| Men | 3 |
| Women | 19 |
| Age, mo | 43 |
| Time in ICU, mo | 11 |

CCN = critical care nurse; ICU = intensive care unit.

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