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## Review Article

# The bloody truth: Investigating nurse phlebotomy competencies at a private laboratory in Johannesburg, South Africa

Lizelle Crous<sup>\*,1</sup>, S.J. Armstrong<sup>2</sup>

University of the Witwatersrand, 7 York Road, Parktown, 2193, South Africa

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## ABSTRACT

**Background:** With the introduction of the phlebotomist technician-certification programme in South Africa, nurses' phlebotomy competence, an acquired skill during basic training, was questioned. Various studies indicate that the majority of errors occur during the collection phase, causing negative outcomes for the patient.

**Objective:** Despite in-service training, samples were rejected and linked to the nurse phlebotomist's sample collection technique. The purpose of this study was to establish if nurses' phlebotomy techniques could be improved through a workplace-training programme in the attempt to improve the quality of the test results.

**Method:** The methodology used was a quantitative, experimental, pilot intervention study, based on a one group pre-test - post-test design. Data was collected by means of peer video recordings of the nurses (n = 20) based at outpatient departments of the laboratory. Independent evaluators evaluated the recordings against criterion-based observational checklists.

**Results:** Compliance to standards on the venepuncture procedure was identified during the pre-test, with an average score of 61.9%. The training programme, developed to address all deviations from the standards, proved to be effective as the post-test compliance score was 85%.

**Conclusion:** The reason for improving nurses' phlebotomy skills is to ensure accurate results that will assist clinicians caring for their patients. The results suggest that knowledge and skills were acquired, however further investigations are needed for guidance in the standardisation of training programmes and at what intervals should these training programmes be presented.

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\* Corresponding author. Fax: +27 11 488 4195.

E-mail addresses: [Lizelle.Crous@wits.ac.za](mailto:Lizelle.Crous@wits.ac.za) (L. Crous), [Sue.Armstrong@wits.ac.za](mailto:Sue.Armstrong@wits.ac.za) (S.J. Armstrong).

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## 1. Introduction

In modern medicine, doctors rely heavily on diagnostic testing to assist them with patient management, making or excluding diagnosis and implementing an appropriate treatment plan. It is therefore important that the laboratory produces quality test results.

Phlebotomy is a neglected procedure in healthcare. Limited time is spent on training nurses and doctors on the procedures and yet it involves serious health risks, which could result from improper venepuncture technique impacting on the patient treatment outcomes. In European countries and the USA, specially trained phlebotomists perform phlebotomy procedures, whilst in most African countries medical professionals perform phlebotomy procedures. In South Africa, however, the situation is more complex as phlebotomy is performed by both health professionals and trained phlebotomists, with different competency requirements for both (Mbah, 2014). The phlebotomist technician qualification is an 18-month certificate and on completion thereof, a person registers with the Health Professions Council of South Africa (HPCSA). This programme focuses primarily on the venepuncture procedure and clear guidance is given with regard to the requirements of training and competence, which will lead to a person registering as a phlebotomist (Presley & Liotta, 2006). Unlike the phlebotomy technicians nursing staff do not need a certificate for phlebotomy and therefore training programmes vary in requirements and set outcomes.

In South Africa, phlebotomy is considered an acquired skill and not a discipline. With the increase in patient numbers, doctors realised they cannot keep up with providing all aspects of quality patient care and nurses were taught how to take blood at the patient's bedside. Nurses were available to patients around the clock and it seemed to be a practical and justifiable solution to a problem for nurses to take blood on the orders of a doctor. With the increase in laboratory tests ordered by doctors to make timeous diagnoses, and a growing shortage of registered nurses at the patient's bedside, laboratories started employing nurses to perform phlebotomy procedures in hospitals. Phlebotomy procedures were therefore included in the skills taught as part of the requirements of the qualifications of nurses, however teaching time spent on performing a venepuncture may vary from one institution to another. Due to limited opportunities nurses have to obtain phlebotomy skills in the hospital setting, the focus of training has shifted from the venepuncture technique to accessing a vein for intravenous therapy (IV). Even if the nurse has many years of experience in starting an IV, a different approach is involved to perform a successful venepuncture (Ernst, 1998). The assumption has been that nurses are trained on phlebotomy procedures during their basic training, and once employed as a phlebotomist, they only receive in-service training delivered by older, more experienced nurses working at the laboratory. This has led to technique variations and the lack of a standardised training programme for nurses performing a phlebotomy procedure that is impacting on the quality of the test outcomes (Lima-Oliveira et al., 2012). Due to the differences in training outcomes between nurses and the phlebotomist technician, the competence and skill of nurses

working as phlebotomists in the laboratory was questioned, when considering employing new "phlebotomists".

The nurse (phlebotomist) is the person responsible for ensuring specimen quality in the pre-analytical phase of laboratory testing. The collection process forms part of the pre-analytical phase where 60–70% of errors occur (Green, 2008). Samples collected by a human, are prone to errors as humans can err. Errors in the pre-analytical phase, especially during the specimen-collection process, may cause negative outcomes for the patient which range from financial implications to death. Complications associated with the collection process are preventable and are directly linked to the technique of the nurse or phlebotomist. An opportunity for errors is created when nurses lack knowledge about laboratory practices or do not have the appropriate skill to perform the necessary procedures. Lack of quality control might also be an issue (Ernst & Ballance, 2006). Two of the major complications that can occur due to improper technique are haemolysis and haemoconcentration. An example would be prolonged tourniquet application will result in haemoconcentration, where blood plasma infiltrates the surrounding tissue causing an increased concentration of protein-based analytes in the blood. It will go unnoticed when tested and the clinician will diagnose the patient based on the erroneous results. A haemolysed sample, detected by visual inspection of the sample and may be caused by usage of the wrong needle size, is unacceptable and unsuitable for testing and will result in the patient being re-bled (Ernst & Ballance, 2006).

Previous studies (Green, 2008; Hawkins, 2012; Lippi, 2009; Sharma, 2009) investigated the errors that can occur if the wrong technique has been followed and indicate that it is vital to improve the quality of the service being rendered. Although all studies indicate training is vital (Lippi, Salvagno, Montagnana, Franchini, & Guidi, 2006), South Africa doesn't have a standardised training programme for nurses performing phlebotomy procedures. Ernst (2011) indicated that phlebotomy training must be of good quality so that the phlebotomist understands the implications of the wrong technique and errors in the pre-analytical phase's impact on test result outcomes.

Ernst (1998) stated that one of the four indefensible errors in phlebotomy is inadequate training. In South Africa, nurses performing phlebotomy procedures in the laboratory setting receive only in-service training or on the job training. The training programmes are developed by phlebotomy experienced nurses and are specific to that laboratory's policies. Training programmes for nurses vary not only between the different private laboratories but also from one region to another within a specific private laboratory group. Training and assessment for competency is not standardised, the nurses are also not trained on specific tests, the requirements for the tests and what may influence the outcome of those tests.

The best way to improve the quality of the specimens and to reduce errors whilst performing the procedures is to observe staff while they perform a venepuncture and identify the mistakes they make, and more importantly test their understanding of the impact of that particular error has on the outcome of the test (Ernst, 2011).

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