

## Research Article

# Phlebotomy Standard Operating Procedures (SOP): An Observational Study about Knowledge, Training, and Adherence of Phlebotomists

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## Abstract

**Aim:** This is a prospective cohort study aimed to evaluate Knowledge, training, and adherence of phlebotomists with phlebotomy Standard Operating Procedure (SOP).

**Material and methods:** This is a prospective cross-sectional study carried out at two hospitals and a central National Laboratory. In Khartoum state, Sudan Data collection was done through interview of 193 health professionals using a pretested structured questionnaire.

**Results:** The total number of the participants is 193; 41% of them were males and 59% were females 48.7% of the study population were nurses, 32.1% were lab technicians and 19.2% were medical doctors. 77.9% of the study population claimed that they don't have knowledge regarding phlebotomy SOP and did not receive necessary phlebotomy training. 75.3 of study population stated there is no SOP manual available at the phlebotomy stations. If present, 68.7% are not satisfied with SOP manual available and 66.9% of the participants acknowledged that they do not always adhere to the phlebotomy SOP manual available at the phlebotomy site.

**Conclusion:** Phlebotomy SOP knowledge and training are very insufficient among study population. Those who have SOP manuals available they do not always adhere to such SOPs. Furthermore, Majority the phlebotomy stations don't have SOP manuals with satisfactory descriptions and details and regular updates.

**Keywords:** Standard operating procedure (SOP); Phlebotomy; Blood

## Introduction

Phlebotomy-the drawing of blood-is one of the most common invasive procedures in health care [1,2]. There are several opportunities for making errors during phlebotomy which affect laboratory results and patient outcome [2,3]. Lack of knowledge and training about phlebotomy Standard Operating Procedure (SOP) and poor adherence to such (SOP) will result in incorrect laboratory results which lead to wrong diagnosis and treatment [2-5]. Improved standardization of phlebotomy techniques, along with operative guidelines dissemination, continuous education, certification, and training of health care professionals involved in blood drawing responsibilities would enhance the chance of obtaining specimens of excellent quality [1,3,4].

If a blood sample is poorly collected, the results may be inaccurate and misleading to the clinician, and the patient may have to undergo the inconvenience of repeat testing [1-3].

SOPs are required for each step or procedure [5]. They should be written and be readily available to health workers. Education and training are necessary for all staff carrying out phlebotomy [5]. Supervision by experienced staff and structured training is necessary for all health workers, including physicians, who undertake blood sampling [1,4]. Best practices in phlebotomy involve the following components Phlebotomy SOP.

### Assemble equipment

Collect all the equipment needed for the procedure and place it within safe and easy reach on a tray or trolley, ensuring that all the items are clearly visible [1,2].

### Identify and prepare the patient

Introduce yourself to the patient, and ask the patient to state their full name. Check that the laboratory form matches the patient's identity [6,7].

### Select the site

Extend the patient's arm and inspect the antecubital fossa or forearm. Locate a vein of a good size that is visible, straight and clear. The vein should be visible without applying the tourniquet. Apply the tourniquet about 4-5 finger widths above the venepuncture site and re-examine the vein. In hospitalized patients, do not take blood from an existing peripheral venous access site because this may give false results [1,3].

### Perform hand hygiene and put on gloves

Perform hand hygiene; that is wash hands with soap and water, or if hands are not visibly contaminated, clean with alcohol rub. After

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performing hand hygiene, put on well-fitting, non-sterile gloves [1,2].

### Disinfect the entry site

Clean the site with a 70% alcohol swab for 30 seconds and allow drying completely. Alcohol is preferable to povidone-iodine [1,2].

### Take blood

Steady the vein by holding the patient's arm and placing a thumb BELOW the venipuncture site (Figure 1) [2]. Ask the patient to form a fist so the veins are more prominent. Enter the vein swiftly at a 30-degree angle or less, and continue to introduce the needle along the vein at the easiest angle of entry. Once sufficient blood has been collected, release the tourniquet BEFORE withdrawing the needle [6]. Withdraw the needle gently and apply gentle pressure to the site with a clean gauze [1,3].

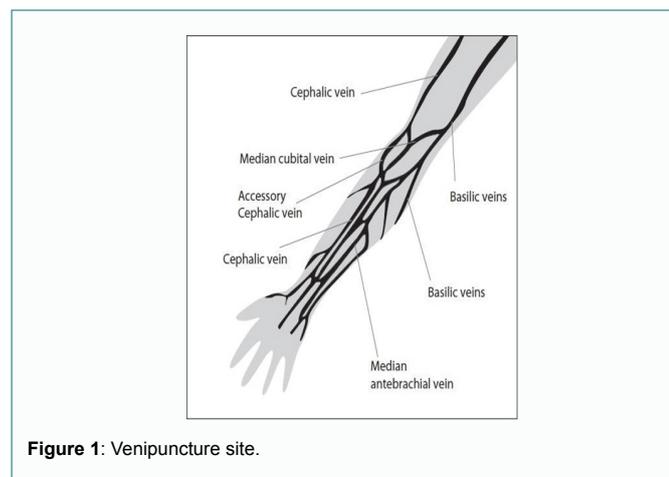


Figure 1: Venipuncture site.

### Fill the laboratory sample tubes

When obtaining multiple tubes of blood, use evacuated tubes with a needle and tube holder. This system allows the tubes to be filled directly. If this system is not available, use a syringe or winged needle set instead. If a syringe or winged needle set is used, best practice is to place the tube into a rack before filling the tube. To prevent needle-sticks, use one hand to fill the tube or use a needle shield between the needle and the hand holding the tube [1,3].

### Clean contaminated surfaces and complete patient procedure

Discard the used needle and syringe or blood sampling device into a puncture-resistant sharps container. Check the label and forms for accuracy. The label should be clearly written with the information required by the laboratory, which is typically the patient's first and last names, file number, date of birth, and the date and time when the blood was taken [1,4].

### Prepare samples for transportation

Pack laboratory samples safely in a plastic leak-proof bag with an outside compartment for the laboratory request form. If there are multiple tubes, place them in a rack or padded holder to avoid breakage during transportation. [1,2,4].

### Step-by-step phlebotomy procedure

The aim of this cohort study is to evaluate Knowledge, training, and adherence of phlebotomists with phlebotomy Standard Operating Procedure (SOP) (Figure 2).

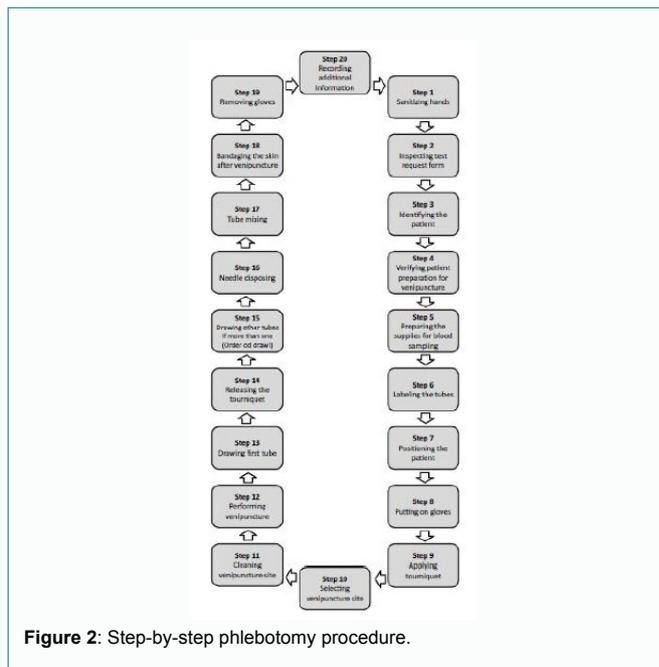


Figure 2: Step-by-step phlebotomy procedure.

## Methods

The Study design is Prospective cross-sectional hospital and laboratory-based study. Study population included phlebotomists from Health professionals (Laboratory Staff, Nurse, Medical doctors) in two Khartoum state hospitals and one laboratory: Soba University Hospital, Ribat National Hospital, and National Laboratory for Public Health from April 2018 to August 2019. Exclusion criteria included non-medical personnel performing the procedure. Data collection was done through interview of the health professionals in the chosen hospitals. Data collection was done using a pretested structured questionnaire. The questionnaire contained two parts, the first one covered the demographic data, the second part the knowledge and attitude of health professionals for phlebotomy and the last part covered the Participant adherence to phlebotomy SOP.

The data was coded and entered to SPSS data sheet version 23, and then the same program was used to analyze the data. The analysis was descriptive and statistical.

With regard to ethical consideration, the researcher provided the respondents with simplified description on the study purpose and objectives in simple and comprehensible language. The researcher informed the respondents that he/she has the full right to voluntarily participate in or withdraw from the study at any time. The researcher provided the Confidentiality and privacy of the respondents' questionnaires and information. The data was collected using coding system where each respondent was assigned with code, his/her name will not be used, and the data will never be used for any purpose rather than the objectives of the study. The researcher informed the respondents using very simple language how this study will be beneficial to him as individual and the rest of the community in terms of providing the knowledge on the determinants of care seeking behavior and the relevant recommendation to the authorized entities.

## Results

The total number of the participants in the current study was 193; 41% of them were males and 59% were females. Regarding their

occupation it was found that 48.7% of the study populations were nurses, 32.1% were lab technicians and 19.2% were medical doctors (Figure 3). 77.9% of the study population claimed that they don't have knowledge regarding phlebotomy standard operating procedures and did not receive necessary phlebotomy training (Figure 4) 75.3 of study population stated there is no SOP manual available at the phlebotomy stations (Figure 5). 66.9% of the participants acknowledged that they do not always follow the phlebotomy SOP manual if present (Figure 6). 68.7% are not satisfied with SOP manual available (Figure 7).

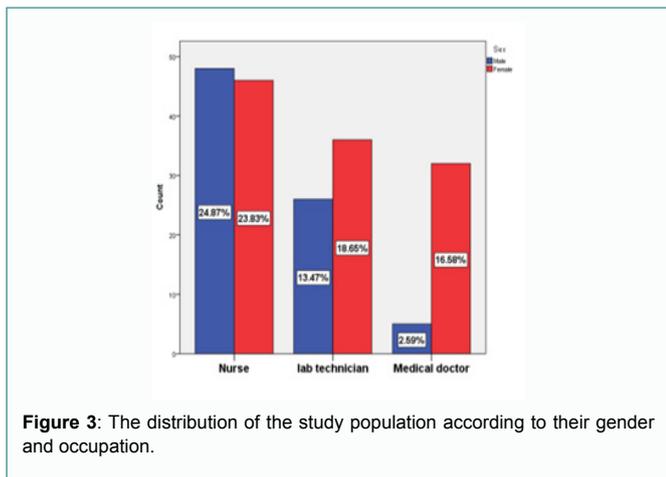


Figure 3: The distribution of the study population according to their gender and occupation.

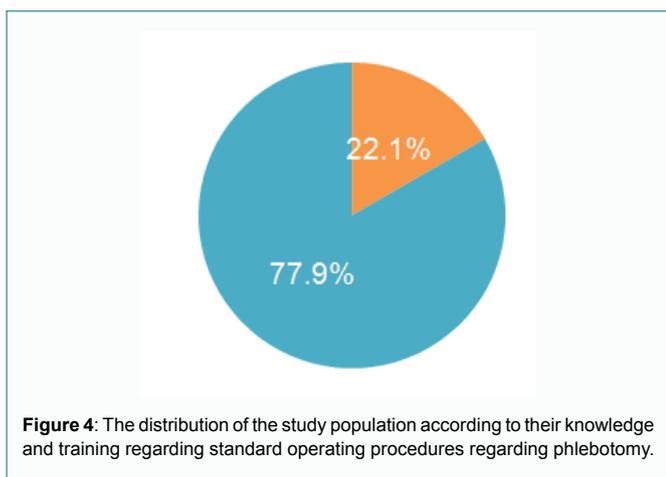


Figure 4: The distribution of the study population according to their knowledge and training regarding standard operating procedures regarding phlebotomy.

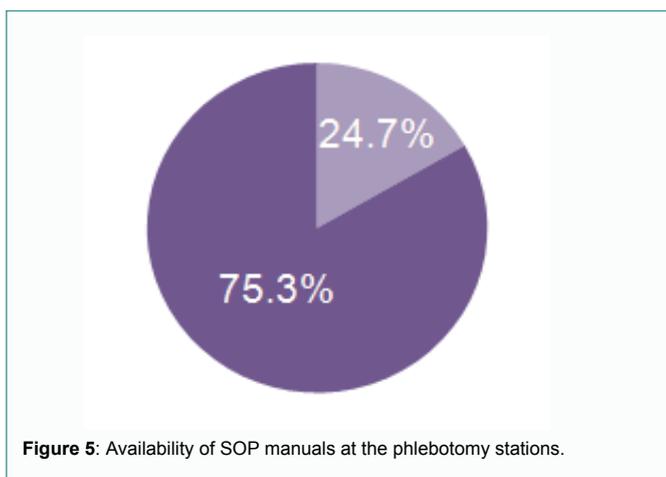


Figure 5: Availability of SOP manuals at the phlebotomy stations.

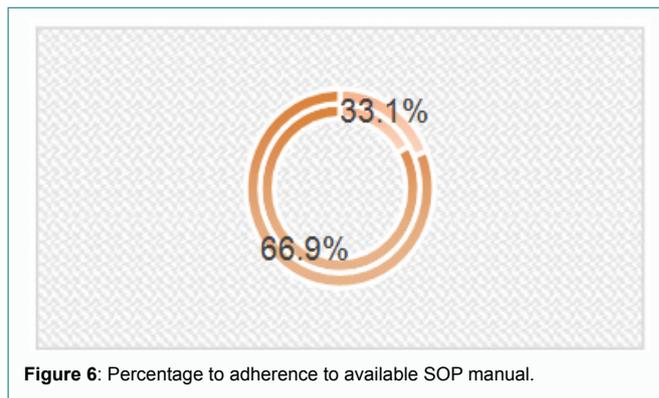


Figure 6: Percentage to adherence to available SOP manual.

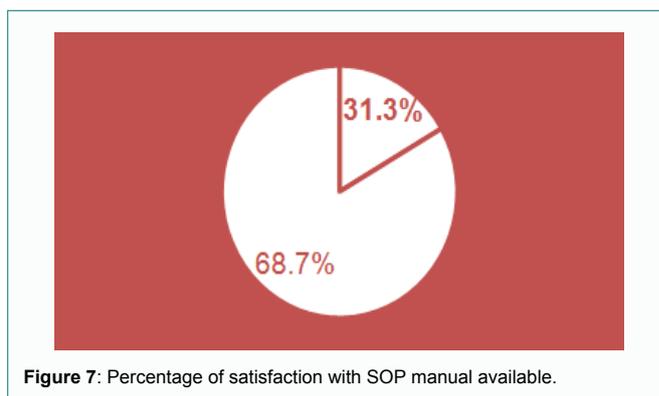


Figure 7: Percentage of satisfaction with SOP manual available.

### Discussion

The current study aimed to assess knowledge and training and to evaluate adherence of phlebotomists with phlebotomy Standard Operating Procedure (SOP). Within three medical institutions in Khartoum state, Sudan. The participants were medical doctors, lab technicians and nurses. Nurses were the most abundant phlebotomists during this study, indicating that most phlebotomy practices are performed at the ward level. This could necessitate more training, supervision, proper sample transportation and provision of suitable phlebotomy materials.

It was surprising the majority of the participants did not receive proper teaching and training which is considered as fundamental factor preventing erroneous lab results. This may be attributed to inadequate undergraduate teaching and training in the field of phlebotomy. Again, the majority stated that no available SOP manuals within the health institutions (medical labs, wards and referred clinics).

It was observed that the majority of the participants (81%) of the phlebotomists acknowledged that they do not always follow the phlebotomy SOP manual if present. it is observed this happens because of lack knowledge about importance of performing correct phlebotomy practice and its effect on the quality of the sample and lab results. In addition, tow third of the participants are not satisfied with SOP manual available in their phlebotomy station claiming the it does not include all aspects of the procedure and no regular updates are added.

### Conclusion

- Phlebotomy SOP knowledge and training are very insufficient

among study population.

- Those who have SOP manuals available they do not always adhere to such SOPs.
- Majority the phlebotomy stations don't have SOP manuals with satisfactory descriptions and details and regular updates.
- The study demonstrated that the level of compliance of phlebotomy procedures with the international or local SOP was unacceptably low.

## Recommendations

1. Implementation of proper training and knowledge of phlebotomy practice and SOP within the undergraduate curricula in medicine, nursing and medical laboratory sciences.
2. Improve the knowledge related to the phlebotomy malpractice and its impact on the quality of the sample and its effect on the analytes.
3. Establishment of national SOP to be applied all over health institutions in the Sudan.
4. Ensure the availability of the SOP manuals within the medical wards and clinical labs to ease its access and implementation of the right practice.

## References

1. WHO Guidelines on Drawing Blood: Best practices in phlebotomy. Geneva: World Health Organization; 2010.
2. Nikolac N, Supak-Smolčić V, Simundić AM, Celap I. Croatian society of medical biochemistry and laboratory medicine. croatian society of medical biochemistry and laboratory medicine: national recommendations for venous blood sampling. *Biochem Med (Zagreb)*. 2013;23(3):242-54.
3. Ialongo C, Bernardini S. Phlebotomy, a bridge between laboratory and patient. *Biochem Med (Zagreb)*. 2016;26(1):17-33.
4. Simundic AM, Cornes M, Grankvist K, Lippi G, Nybo M, Kovalevska S, et al. Survey of national guidelines, education and training on phlebotomy in 28 European countries: an original report by the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) working group for the preanalytical phase (WG-PA). *Clin Chem Lab Med*. 2013;51(8):1585-93.
5. van Dongen-Lases EC, Cornes MP, Grankvist K, Ibarz M, Kristensen GB, Lippi G, et al. Patient identification and tube labelling - a call for harmonisation. *Clin Chem Lab Med*. 2016;54(7):1141-5.
6. Nikolac N, Krleža JL, Simundic AM. Preanalytical external quality assessment of the Croatian Society of Medical Biochemistry and Laboratory Medicine and CROQALM: finding undetected weak spots. *Biochem Med (Zagreb)*. 2017;27(1):131-43.
7. Simundic AM, Church S, Cornes MP, Grankvist K, Lippi G, Nybo M, et al. Compliance of blood sampling procedures with the CLSI H3-A6 guidelines: An observational study by the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) working group for the preanalytical phase (WG-PRE). *Clin Chem Lab Med*. 2015;53(9):1321- 31.