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Quality Care Through Clinical Audit: Blood Sampling Practices By Nurses In The Emergency Department Of A University Affiliated Teaching Hospital

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Abstract

Objective: We aimed to conduct an audit to investigate whether the steps of phlebotomy performed by nurses in our emergency department were in line with the WHO guidelines on drawing blood. Based on our investigation, we could then make interventions to ensure that the guidelines were followed diligently. This would be followed by a repeat audit to determine if there was an improvement in adherence to the guidelines.

Methods: This clinical audit was conducted in the Emergency Department of the Holy Family Hospital, Rawalpindi. Nurses working in the department were included in the audit. Medical and nursing students, along with doctors were excluded. The initial audit was conducted from 1st to 7th July 2021. A total of 54 instances of phlebotomy were observed and analyzed. The results of this analysis were used to devise interventions for improvement.

Interventions included an interactive training session for the nursing staff, installation of visual cues in the department, ensuring better availability of equipment and formation of a team to ensure that the guidelines are being followed. A repeat audit was performed from 23rd to 30th August 2021 in which a total of 58 instances of phlebotomy were covertly observed. The chi-square test was used to compare the percentages between the initial audit and the repeated audit. A p-value <0.05 was considered significant.

Results: Steps that were least adhered to by the nursing staff were the performance of hand hygiene (16.7%), asking patients to form a fist (79.6%), putting on well-fitting sterile gloves (0.0%), disinfecting the site of phlebotomy (59.3%) and the removal of gloves (3.7%). After intervention, a significant improvement was noted in all these steps in the second audit.

Conclusion: Many of the steps recommended in WHO guidelines were frequently being missed by the nursing staff in our emergency department as observed in the first audit. However, adherence to the guidelines was better during the repeated audit after appropriate interventions. Further interventions and continuous auditing are the key to further improving adherence to the WHO guidelines.

MeSH Keywords: Phlebotomy, Clinical Audit, Emergency Department.

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1. Introduction

Phlebotomy is the process of using large, hollow needles to draw blood from veins for testing, donation or therapeutics.[1-3] It is one of the most common invasive procedures in healthcare. Each step in the process of phlebotomy affects the quality of the blood specimen and is thus important in preventing laboratory errors. Following the steps correctly is also important to prevent patient and healthcare worker injury.

There are various risks associated with the process of drawing blood. One of them is the exposure to blood from other people potentially leading to infections from bloodborne pathogens. Other complications of phlebotomy include infection from skin-borne pathogens, hematoma formation, nerve injury, arterial punch and syncope due to vasovagal response.[2]

Many of the complications of phlebotomy can be prevented by following the correct techniques and practices as outlined in the World Health Organization (WHO) guidelines on drawing blood.[4]We aimed to conduct an audit to investigate whether the steps of drawing blood performed by nurses in our emergency department were in line with these guidelines. Based on our investigation, we could then make interventions to ensure that the guidelines were followed diligently. This would be followed by a repeat audit to determine if there was an improvement in adherence to the WHO guidelines.

2. Materials & Methods

This clinical audit was conducted in the Emergency Department of Holy Family Hospital, Rawalpindi. Nurses working in the department were included in the audit. Medical and nursing students, along with doctors were excluded. The initial audit was conducted from 1st to 7th July 2021. Nurses were covertly observed and the observations were recorded on a computerized form. A total of 54 instances of phlebotomy were observed. The data was analyzed using MS Excel and IBM SPSS version 25. The results of this analysis were used to devise recommendations for improvement.

An interactive training session was conducted for the nursing staff in which a computer presentation detailing WHO guidelines for phlebotomy was initially shown. This was followed by a group discussion. Important steps that were frequently missed were identified and reasons for missing the steps were analyzed. A short test was administered at the end to ensure that the nursing staff had become well acquainted with the guidelines. In addition, visual cues in the form of posters were displayed at various locations in the department which contained brief instructions for phlebotomy according to the guidelines, along with a reminder to adhere to them. Department administration was contacted to make sure that all the necessary equipment was easily available throughout the department. A small departmental health team was formed to observe that guidelines were being followed.

A repeat audit was performed from 23rd to 30th August 2021. A total of 58 instances of phlebotomy were covertly observed and the observations were recorded in a similar form to the initial audit. The data was again analyzed using MS Excel and IBM SPSS version 25. The chi-square test was used to compare the percentages between the initial audit and the repeated audit. A p-value <0.05 was considered significant.

3. Results

Results showing the proportion of times the steps of phlebotomy were correctly followed in each audit are shown in Table 1 and Graph 1. Steps that were most commonly missed by the nursing staff were the performance of hand hygiene, asking patients to form a fist, putting on well-fitting sterile gloves, disinfecting the site of phlebotomy and the removal of gloves. After intervention, a significant improvement was noted in all these steps in the second audit (table 1).

Table 1: Steps of phlebotomy which were correctly followed in each audit

Steps of Phlebotomy	Instances Of Steps Followed Correctly Before Intervention	Instances Of Steps Followed Correctly After Intervention	p-value
Equipment assembled	51/54 (94.4%)	57/58 (98.3%)	0.27
Hand hygiene performed	9/54 (16.7%)	22/58 (37.9%)	0.01
The patient prepared and identified	51/54 (94.4%)	58/58 (100%)	0.07
Site selected	54/54 (100%)	57/58 (98.3%)	0.33
Tourniquet applied	54/54 (100%)	57/58 (98.3%)	0.33
The patient asked to form a fist	43/54 (79.6%)	58/58 (100%)	<0.01
Well-fitting and sterile gloves put on	0/54 (0.0%)	25/58 (43.1%)	<0.01
Site disinfected	32/54 (59.3%)	52/58 (89.7%)	<0.01
Vein anchored	52/54 (96.3%)	53/58 (91.4%)	0.29
Entered the vein swiftly at a 30-degree angle	51/54 (94.4%)	56/58 (96.6%)	0.57
Tourniquet released	51/54 (94.4%)	58/58 (100%)	0.07
The needle was withdrawn gently and the patient was given a clean gauze	49/54 (90.7%)	57/58 (98.3%)	0.08
Used needle discarded	53/54 (98.1%)	56/58 (96.6%)	0.62
Label and forms checked for accuracy	52/54 (96.3%)	56/58 (96.6%)	0.93
Sharps and broken glass discarded into the sharp container	49/54 (90.7%)	56/58 (96.6%)	0.20
Gloves were removed after the procedure	2/54 (3.7%)	11/58 (19.0%)	0.01

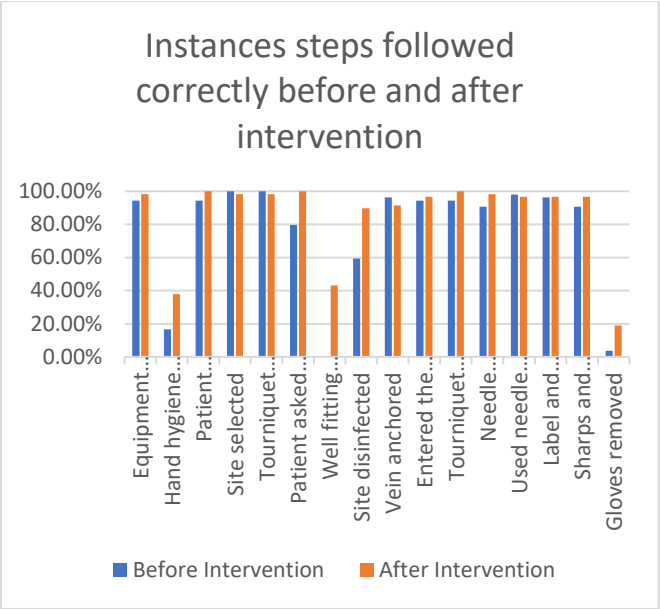

Figure 1: Instances steps followed correctly before and after intervention

4. Discussion

Our results, especially of the first audit showed that some steps of phlebotomy suggested by the WHO guidelines were not regularly followed in our department. Studies around the world have also reported non-compliance with the WHO guidelines on drawing blood. Researchers in one such study observed 200 instances of phlebotomy and none could meet the full criteria of good and safe phlebotomy practice as described by WHO.[6] In each instance, at least one of the important steps was missed. Another study described the common inappropriate practices to be the use of a single glove for more than one client, inappropriate cleaning practice of vein puncture sites, collecting blood before the disinfectant alcohol dried, incorrect tube collection sequences, unnecessarily applying of tourniquets after blood started flowing into the collection tubes and syringes and applying tourniquets before locating and selecting appropriate site for venous blood collection.

In an intervention study conducted in South Africa, a checklist of 18 steps of phlebotomy was formed based on the WHO criteria.[7] In the initial round of observation, the average score of steps performed correctly by each nurse was 61.9% after which a training program based on group discussion and peer evaluation was implemented. In the second round of observation, the average score of each nurse improved to 85%. The percentage of the times each step was performed correctly improved in the second round of observation; a finding similar to ours.

Although we noted significant positive changes in the second audit there was still a large room for improvement in some steps. These include performance of hand hygiene, and putting on and removing well-fitting sterile gloves. Further rounds of interventions and audits are the key to further improvement in these areas.

5. Conclusion

Many of the steps recommended in WHO guidelines were frequently being missed by the nursing staff in our emergency department as observed in the first audit. However, adherence to the guidelines was better during the repeated audit after appropriate interventions. Further interventions and continuous auditing are the key to further improving adherence to the WHO guidelines.

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A.M, M.A.A, - Conception of study
A.M, M.A.A, - Experimentation/Study Conduction
A.M, M.A.A, M.A[3], M.A[4]- Analysis/Interpretation/Discussion
A.M, M.A.A, M.A[4], M.F.H,- Manuscript Writing
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