

A Pre Experimental Study to Assess the Effectiveness of Structured Teaching Programme (STP) on Knowledge and Practice Regarding Blood Collection Vacutainers among Staff Nurses Working in Selected Hospital of Delhi/NCR

Sindhu Jose¹, Lavanya Nandan², Sibi Samuel³

²Director, Principal, Nightingale Institute of Nursing, Noida, India

³Lecturer, Nightingale Institute of Nursing, Noida, India

Abstract: A pre experimental study design was used for the study. Non-probability convenient sampling technique used to select the sample i.e. 30 staff nurses working in selected hospital. A structured knowledge questionnaire of 20 questions and practice checklist of 20 items were prepared to assess the knowledge and practice of the staff nurses. Result shows that majority of the staff nurses had good as well as average knowledge (46.6%) whereas majority of the staff nurses were having good practice of blood collection vacutainers. It was evident from the results that the mean post-test knowledge (96.6% excellent) and practice score (90% excellent) were more than mean pre-test scores. The obtained mean difference of pre-test-post-test knowledge and practice score was found to be statistically significant as evident from the "t" value of (18.93)(20.91) respectively which was greater than table value (2.05) for df (29) at 0.05 level of significance. There was a significant association between post- test practice score with educational qualification. Hence, the study concluded that structured teaching programme was effective in improving the knowledge and practice among staff nurses.

Keywords: Structured teaching programme, knowledge, practice

1. Introduction

A vacutainer blood collection tube is a sterile glass or plastic test tube with a colour rubber stopper creating a vacuum seal inside of the tube, facilitating the drawing of a predetermined volume of liquid. Vacutainer tubes may contain additives designed to stabilize and preserve the specimen prior to analytical testing. [1] Tubes are available with a safety-engineered stopper, with a variety of labelling options and draw volumes. The colour of the top indicates the additives in the vial. Vacutainer tubes were invented by Joseph Kleiner and Becton Dickinson in 1949. Vacutainers have the advantage of being prepared with additives, allowing easy multi-tube draws, and having a lower chance of haemolysis.

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. The three major issues resulting from errors in collection are haemolysis, contamination and inaccurate labelling. [2] Factors that increase the risk of haemolysis include use of a needle of too small or large a gauge for the vessel.. The syringe plunger to force the blood into a tube, thus increasing the shear force on the red blood cells; drawing blood specimens from an intravenous or central line. On the other hand under filling a tube so that the ratio of anticoagulant to blood is greater than 1:9, reusing tubes that have refilled by hand with inappropriate amounts of anticoagulants; mixing a tube too vigorously. Also, failing to let disinfectant dry; using too great a vacuum; for

instance, using too large a tube for a paediatric patient, or using too large a syringe.

2. Literature Survey

The nursing staff need not be expert in technical details of laboratory analysis but awareness of common pre-analytical variables is favourable as their knowledge has significant effect on sample collection process and subsequently the laboratory test results. Insufficient quantity and inappropriate quality of specimen may account for over 60% of pre-analytical errors. [3] The lack of understanding of blood collection process errors in patient identification and preparation, defect in sample collection device or container and error in sample handling ultimately compromise laboratory results. These errors can seriously affect reliability of test result and affect patient care adversely [4]. As the sample collection is performed by nursing staff these errors can rarely be identified by the laboratory. Proper handling with blood collection devices is essential for specimen quality.

3. Statement of Problem

"A pre experimental study to assess the effectiveness of structured teaching programme (STP) on knowledge and practice regarding blood collection vacutainers among staff nurses working in selected hospital of Delhi/NCR."

4. Methods/Approach

The objectives of the study were to assess the level of knowledge and practice regarding blood collection vacutainers among staff nurses, to evaluate the effectiveness of structured teaching programme (STP) on knowledge and practice regarding blood collection vacutainers among staff nurses and to determine the association between the post-test knowledge and practice score regarding blood collection vacutainers among staff nurses with selected demographic variables. Pre-experimental research approach and pre-experimental: one group pre-test post-test research design were adopted. The study was conducted at Prayag Hospital, Sector- 41, Noida, Delhi/NCR. Samples (30) staff nurses were selected using non-probability convenient sampling technique. The tool for data collection had two parts. Part 1 consisted of demographic variables i.e. age, gender, educational qualification, years of experience, area of working, previous knowledge and source of information regarding blood collection vacutainers. Part 2 consisted of structured knowledge questionnaire to assess the knowledge regarding blood collection vacutainers. It consists of 20 items. Part 2 consisted of structured observational checklist to assess the practice regarding blood collection vacutainers. It consists of 20 items. Reliability coefficient of structured knowledge questionnaire was calculated by split half formula and value found to be ($r=0.92$) which indicates that tool was reliable. Observational Practice checklist Reliability was calculated by inter rater reliability formula, the reliability value obtained was ($r=0.87$) which indicates that the tool was reliable.

5. Results and Discussion

The collected data was organized, tabulated and analysed by using descriptive and inferential statistics including paired “t” test and Fisher exact test. The results are discussed in following four sections.

Section-I: Findings related to demographic characteristics of staff nurses

Majority of nurses i.e., 22(73.3%) were in the age group of 21-25 years. More than half of the Nurses i.e. 17 (56.6%) were females and 13(43.3%) were males. Educational levels of nurses' majority of nurse's i.e. 21 (70%) were GNM, 7(23.3%) BSc nursing and 2(6.6%) were P.B.BSc nursing. According to year of experience majority i.e. 15 (50%) were having experience of 1-3 years, 7(23.3%) were having 4-5 years and <1 year of experience. Half of the nurses were working in the General Ward i.e. 15 (50%), 5(16.6%) were in other Wards, 4 (13.3%) are in ICU and Emergency. All nurses i.e. 30 (100%) were having previous knowledge. In terms of Source of Information majority of nurses i.e. 27(90%) were having knowledge from In-service education.

Section II: frequencies and percentage distribution of pre-test and post-test knowledge score regarding blood collection vacutainers.

Table 1: frequencies and percentage distribution of pre-test and post-test knowledge score regarding blood collection vacutainers, N=30

Knowledge score	Level of knowledge score	Pre test		Post-test	
		(f)	(%)	(f)	(%)
0-4	Poor	0	0%	0	0%
5-9	Average	14	46.6%	0	0%
10-14	Good	14	46.6%	1	3.3%
15-20	Excellent	2	10%	29	96.6%

Data presented in the Table-1 shows that in pre-test maximum numbers of nurses i.e. 14(46.6%) were having good knowledge as well as average knowledge, and 1(10%) were having excellent knowledge while in post-test maximum numbers of nurses i.e. 29(96.6%) were having excellent knowledge, 1(3.3%) was having good knowledge which indicates an increase in knowledge score. Hence, the teaching programme was effective.

Adrijana Dorotic, (2015) had conducted Survey from four Croatian hospitals 'Hemolysis from a nurses standpoint' -. The aim of this study was to assess nurse's knowledge on the causes of haemolysis and consequential impact on the laboratory tests results. Majority of nurses declared familiarity with the term "hemolysis" (99.6%). There were 77% of correct answers regarding questions about the causes of hemolysis, but only 50% when it comes to questions about interference in biochemical tests. The percentage of correct answers about causes was significantly lower ($P = 0.029$) among more experienced nurses, and higher ($P = 0.027$) in those with higher professional degree, while influence of previous education was not significant. Also, higher percentage of correct answers about interferences was encountered in nurses with longer work experience ($P = 0.039$). More than 70% of nurses declared that additional education about preanalytical factors would be beneficial. Croatian nurses are familiar with the definition of hemolysis, but a lack of knowledge about causes and influence on laboratory test results is evident.[5]

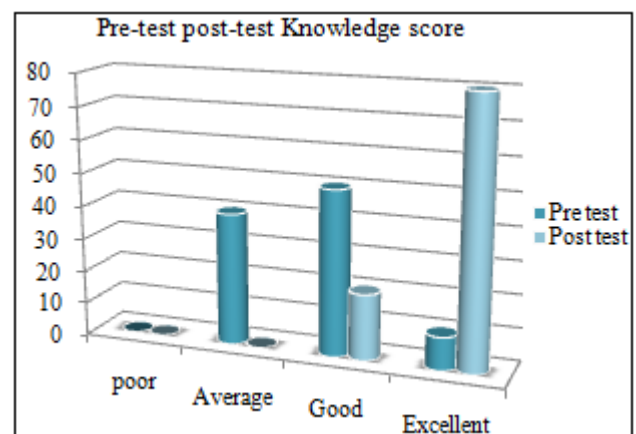


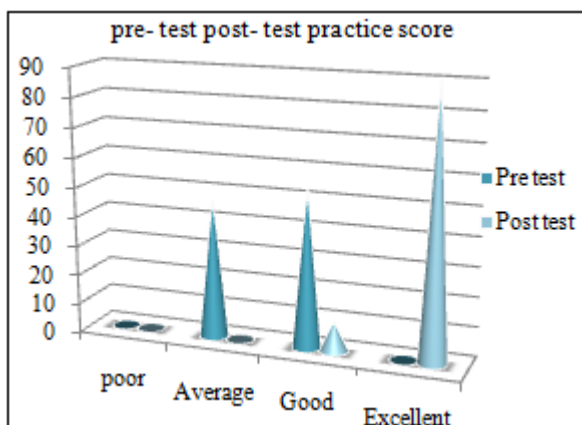
Figure 1: Cylindrical graph showing percentage of pre-test and post-test knowledge score.

Section III: Showing frequency & percentage of pre-test and post-test practice score regarding blood collection vacutainers among staff nurses.

Table 2: Showing frequency & percentage of pre- test and post- test practice score regarding blood collection vacutainers among staff nurses, N=30

Practice score	Level of practice Score	Pre test		Post-test	
		(f)	(%)	(f)	(%)
0-4	Poor	0	0%	0	0%
5-9	average	14	46.6%	0	0%
10-14	Good	16	53.3%	3	10%
15-20	Excellent	0	0%	27	90%

Data presented in the Table-2 shows that in pre-test maximum numbers of nurses i.e.16(53.3%)were having good practice ,14(46.6%) were having average practice, and in post-test maximum number of nurses 27(90%) were having excellent practice and 3(10%) were having good practice which indicates an improvement in practice score. Hence, the structured teaching programme was effective.

**Figure 2:** Conical graph shows percentage of pre- test and post- test practice score of staff nurses regarding blood collection vacutainers.

Section IV: Mean, mean difference, median, standard deviation and paired 't' test value of knowledge regarding blood collection vacutainers among staff nurses.

Table 3: Mean, mean difference, median, standard deviation and paired staff nurses. 't' test value of knowledge regarding blood collection vacutainers among staff nurses, N=30

Knowledge score	mean	Mean difference	median	SD	't' value
pre test	10.2	6.63	10	2.39	18.93*
post test	16.83		16.5	1.53	

*df (29) 2.05 at 0.05 level of Significance

The Data presented in Table 3 Shows that the mean post-test knowledge score (16.83)is higher than the mean pre-test knowledge score (10.2),with the mean difference of 6.63. The obtained mean difference was found to be statistically significant.Calculated 't' value is 18.93 at 0.05 level of significance which is higher than the table value (2.05) for df (29) at 0.05 level of significance.

Section V: Mean, mean difference, median, standard deviation and 't' value of practice regarding blood collection vacutainers among staff nurses.

Table 4: Mean, mean difference, median, standard deviation and 't' value of practice regarding blood collection vacutainers among staff nurses, N=30

Practice score	Mean	Mean difference	Median	SD	't' value
Pre test	9.8	6.3	10	1.47	20.91*
Post test	16.1		16	16	

df(29) 2.05 at 0.05 level of Significance

The Data presented in Table 4 Shows that the mean post-test practice score (16.1)is higher than the mean pre-test practice score (9.8),with the mean difference is 6.3 .The obtained mean difference was found to be statistically significant .Calculated 't' value is 20.91 at 0.05 level of significance which is higher than the table value(2.05) at df (29).

Section VI: Fisher exact test showing the association between the post-test knowledge scores with demographic variables

It was evident from the obtained fisher's exact test values found non-significant which shows there is no significant association between post- test knowledge score with these variables as the 'P' value obtained were greater than 0.05.

Section VII: Fisher exact test showing the association between the post-test practice scores with demographic variables

It was evident from the obtained fisher's exact test value that there was a significant association between post- test practice score with selected demographic variables educational qualification as P value obtained is less than at 0.05 level of significance.

6. Conclusion

The present study aimed to assess the effectiveness of structured teaching program on knowledge, and practice regarding blood collection vacutainers among staffnurses in the selected hospital of Delhi NCR. The results shows the average knowledge and practice existed among the staff nurses working in Prayag Hospital Noida. The planned teaching program was found to be effective in increasing the knowledge, and practice among staff nurses as evident from pre-test and post test scores of staff nurses.

7. Future Scope

- 1) A similar study can be replicated on a large sample from various other categories of government hospitals, there by findings can be generalised for a larger population and on nurses working in every sector.
- 2) Similar kind of study can be conducted using different teaching strategies to assess and evaluate the knowledge and practice of staff nurses regarding blood collection vacutainers.
- 3) A comparative study can be done between corporate hospital and semi-government hospitals working staffs to find the different level of practices incurred at all levels and educate them about evidenced based standard practices.

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Author Profile



Ms Sindhu Jose got her PBBSc nursing degree from Rani Durgawati University Jabalpur M.P. and her MSc Nursing degree from CCS university, UP.



Ms Lavanya Nandan is currently working as Director and Principal, Nightingale Institute of Nursing, Noida, UP.



Ms.Sibi Samual is currently working as a Lecturer at Nightingale Institute of Nursing, Noida, UP.