



Laboratory orientation programme - A need based training for quality reports and enhancing hospital administration

Peer review status:

No

Corresponding Author:

Dr. Senthil Kumaran,
Associate professor, Biochemistry, Chennai medical college, Trichirappalli, Tamilnadu, India, DBlock, L2Shankar abodes, Kumbakonam salai, Thiruvanaikcoil,, 620005 - India

Submitting Author:

Dr. Senthil Kumaran,
Associate professor, Biochemistry, Chennai medical college, Trichirappalli, Tamilnadu, India, DBlock, L2Shankar abodes, Kumbakonam salai, Thiruvanaikcoil,, 620005 - India

Other Authors:

Dr. Shanthi Ramakrishnan,
Medical Administrator, Kauvery Hospital, Tiruchirappalli, India, 620001 - India

Article ID: WMC004854

Article Type: Research articles

Submitted on: 18-Mar-2015, 07:52:16 AM GMT **Published on:** 18-Mar-2015, 10:04:50 AM GMT

Article URL: http://www.webmedcentral.com/article_view/4854

Subject Categories: QUALITY AND PATIENT SAFETY

Keywords: Laboratory errors, Training Programme, Quality Indicators

How to cite the article: Kumaran S, Ramakrishnan S. Laboratory orientation programme - A need based training for quality reports and enhancing hospital administration. WebmedCentral QUALITY AND PATIENT SAFETY 2015;6(3):WMC004854

Copyright: This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC-BY\)](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Source(s) of Funding:

Self Funded

Competing Interests:

Nil

Laboratory orientation programme - A need based training for quality reports and enhancing hospital administration

Author(s): Kumaran S, Ramakrishnan S

Abstract

Preanalytical laboratory errors are a major cause of laboratory errors, which can have extensive negative impact on optimal health delivery. A structured questionnaire and a specific need based training programme were created for health care professionals to reduce preanalytical errors in laboratory services. The health care professionals were given need based training by laboratory experts. There was a statistically significant improvement in basic laboratory knowledge immediately following the need based training programme. The impact of the programme were assessed by analyzing some of the quality indicators like sample rejection, sample retesting and sample outlying turnaround time which shows a statistically significant improvement following the training programme. Periodical need based training programmes regarding preanalytical lab services given to healthcare professionals will have a positive impact on health delivery in hospitals and it has to be implemented for better patient care.

Introduction

Laboratory reports serve as the mainstream in Screening, diagnosis and follow up of the patients nowadays. The laboratory discipline is finding a spectacular improvement technologically, but still laboratory errors do occur¹. The consequences of laboratory errors are posing unnecessary stress to the patients, diagnostic dilemma to the physicians, querying the competency of the laboratory and also the Hospital management². The laboratory errors occur at any of the three phases of laboratory cycle .i.e. pre analytical, analytical and post analytical phase³. It was showed that pre analytical phase contribute much to laboratory errors⁴. Pre analytical phase of the laboratory cycle is longest path where it starts from giving preanalytical instructions to patients, compliance of the patients to the instructions, sample collection, sample processing and transport and also it involves many personnel's in the process^{5,6}. Inadequate knowledge, poor technical skills and

negligence in the preanalytical phase will lead to errors and affect the quality of reports. Adequate training, updating the knowledge on laboratory service and sensitizing about the importance of preanalytical phase will keep a check on the errors.

The present study aims at assessing the basic scientific knowledge on laboratory Medicine, to all the Medical and paramedical workers by conducting a pretest and based on the assessment, need based health education i.e. Laboratory orientation programme for all personnel involving in preanalytical phase to uplift their knowledge and skills. The impact of the present study was analyzed by conducting a post test .The outcome of the orientation programme was assessed by quality indicators such as number of sample rejection, sample rework and sample outlying the turnaround time.

Methods

The present study was conducted at Kauvery Hospitals, a 225 bedded multi specialty hospital, Tiruchirappally, Tamilnadu, India during the period of March 2013 to May 2013. A total number 191 health care professionals, which includes 9 duty doctors, 167 staff nurses and 15 phlebotomists were enrolled for the present study. The areas enlisted in standard questionnaire were assessment of the technique of sample collection, basic scientific knowledge on ideal samples for testing, use of proper anticoagulants, sample request filling, sample handling, sample transport to central laboratory, preanalytical preparation of the patients for sample collection. Based on the results on the assessment, laboratory orientation programme was implemented and trained by consultants in laboratory Medicine. The impact of training was assessed after the training as a measure of outcome of the laboratory orientation programme .The maximum marks allotted was 20 for the present study .Quality indicators such as number of sample rejection, sample rework and sample outlying turnaround time were assessed before and after the orientation programme as an indicator of outcome of the present study.

Results

The total number of healthcare professionals enrolled for the present study was 191, which includes 9 duty doctors, 167 staff nurses and 15 phlebotomists. A Pretest was conducted which includes basic knowledge on laboratory medicine for all of the health care providers for a maximum march of 20 during March 2013. At the same time quality indicators of preanalytical phase such as number of sample rejection, number of sample retest and sample outlying the turnaround times were measured. The pretest score was assessed and need based training programme was conducted during the same month and the effect of training was assessed by a post test. The results were shown in the figure 1. The mean score of the pretest marks was 10.36 and the post test was 14.6. This shows statistically significant results after the laboratory training. The total number of sample rejected during the month of march was 24, re tested 33 and number of samples outlying the turnaround time was 36. The quality indicators after the training during the month of may shows statistically significant reduced in numbers in sample rejection i.e 13, re tested 12 samples and samples outlying the turnaround time was 10. This results were shown in the figure 2.

Discussion

Laboratory services plays main role in managing the patients in modern medicine. In spite of advancement in instrumentation and computer technology, errors still occur in lab services. This has a lot of ramifications, including delayed diagnosis, faulty treatment, patient dissatisfaction, increased costs, legal liabilities and wastage of manpower and resources.

It was well documented that preanalytical phase contributes much frequently among the laboratory errors. For better laboratory administration it is vital to measure the errors, analyze the reasons and intervene the issues.

Health care professionals including duty doctors, staff nurses and lab technicians need to be well trained and oriented in the scientific aspects of preanalytical phase such as technique of sample collection, labeling, transport and documentation. Based on past performances and informal interviews with health care professionals need based training program was planned to reduce the preanalytical errors in kauvery

hospitals. A standard questionnaire was prepared and issued to the health care professionals belonging to kauvery hospitals in the month of march 2013 as a pretest on laboratory practices. This is followed by a need based training programme conducted by specialist in laboratory medicine. 191 health care professionals were included in the present study.

Quality indicators are measurable, objective, quantitative measures of key performances. Every laboratory shall systematically monitor and evaluate the quality indicators. Quality indicators are either being measures of process, outcomes or contribution of the laboratory to the patient care. The quality indicators address three key phases in the laboratory cycle –Preanalytical, analytical and post analytical. A quality indicator assessing the preanalytical variability includes sample rejection, sample retesting and monitoring the turnaround time.

Prior to the need based training programme for the health care professionals, three quality indicators of the preanalytical laboratory services –number of sample rejection, sample retesting and sample turnaround time were assessed for the entire hospital during the month of march 2013. This is followed by the assessment of the same quality indicators month of May 2013. Both the health care professional pre and post test mean score marks and quality indicators before and after the training programme were statistically analysed.

The mean score of the health care professionals regarding the basic science laboratory knowledge prior to the training programme was 10.36 compared with post test score of 14.6 with a *p* value of 0.001 which was found statistically significant.

The outcome of the laboratory orientation programme was assessed by comparing the quality indicators namely sample rejection, sample retesting and sample turnaround time before and after the need based programme. The causes for sample rejection were insufficient sample due to lack of knowledge on adequate sample collection and incompetent technique of collection and also incorrect labeling due to negligence of the phlebotomists. The causes for sample retesting were found to be hemolysis and incorrect processing both due to improper handling of the samples. Sample outlying the turnaround time may be due to preanalytical, analytical and post analytical factors. All the above said issues are well addressed in the orientation programme with clear descriptions.

6491 samples were received by the lab services in the month of march 2013 and 5769 samples were received in the month of may 2013. The number of

sample rejected in march was 24 and in the month of may was 13. The z value was 2.13 and greater than the table value, there is statistically significant difference between both the months with respect to number of samples rejected. In other words the number samples rejected were lesser in the month of may than march 2013.

The number of samples reworked in march was 33 compared to 12 at the month of may. The Z value was 2.81 and greater than table value, there is statistically significant difference between the months with respect to number of samples reworked. In other words the number of samples reworked was lesser in the month of may than march 2013.

The number of samples outlying turnaround time in march was 36 and in the month of may was 16. The Z value was 2.41 and greater the table value, there is a statistically significant difference between both the months with respect to number of samples outlying turnaround time.

It is clear from our study that the need based training programme had a significant improvement upon the basic knowledge among the health care professionals. The laboratory orientation programme had a positive impact which is reflected on the decrease in the numbers of quality indicators such as sample rejection, sample turn over time, sample rework. It is evident that periodical need based training programmes regarding preanalytical lab services, given to health care professionals will have a promising effects on health care delivery in hospitals and it has to be implemented for better patient care.

The study may have been influenced by the changing staff pattern and the inability to train the entire health care professionals involved due to various factors such as absentees, Post duty off, Theatre duty of the staffs. This type of orientation programmes should be done on regular intervals so as to update the laboratory knowledge and issue of quality reports.

Conclusion(s)

Preanalytical lab errors are major sources of lab errors, which can have have extensive negative impact on optimal health delivery. Adequate training, awareness and structured coaching about the aspects in preanalytical phase will keep a check on preanalytical errors. A need based training programme was conducted based on the assessment of basic knowledge by conducting a pretest. The result of the programme was assessed by conducting post test .It was showed in the present study that significant

improvement of the marks scored in post test when compared with the pretest. The outcome of the programme was quantified in terms of analyzing the impact in terms of quality indicators such as sample rework, sample rejection and sample outlying turnaround time, which shows there was a reduction in the above said indicators, which serve as a proof that the programme has got positive impact among the healthcare workers and conclude that this laboratory knowledge implement programme will enhance the quality of reports for better patient care.

Acknowledgement(s)

The present study was done for fulfillment of Master of Hospital administration, School of Management Studies, Tamilnadu Open University.

References

1. Bonini A, Plebani M, Ceriotti F, Rubboli F. Errors in laboratory medicine. *Clin Chem* 2002; 48: 691-8.
2. Kalra J. Medical errors: Impact on clinical laboratories and other critical areas. *Clin Biochem* 2004; 37:1052-62.
3. McSwiney RR, Woodrow DA. Types of error within a clinical laboratory. *J Med Lab Technol* 1969; 26: 340-6.
4. Binita Goswami, Bhawna singh, Ranjna Chawla and Venkatesan Mallika. Evaluation of Errors in a clinical Laboratory: a One – year experience. *Clin Chem Lab Med* 2010; 48(1): 63-66 .
5. Giuseppe Lippi Gian Cesare Guidi, Camilla Mattiuzzi and Mario Plebani . Preanalytical variability: the dark side of the moon in laboratory testing . *Clin Chem Lab Med* 2006; 44(4) : 358-365.
6. Young S. Conveying the importance of the preanalytical hase. *Cin Chem Lab Med* 2003; 41:884-7

Illustrations

Illustration 1

Figure 1: Shows that there was a significant increase in the mean marks scored by laboratory personnel before and after undergoing the training programme on preanalytical issues

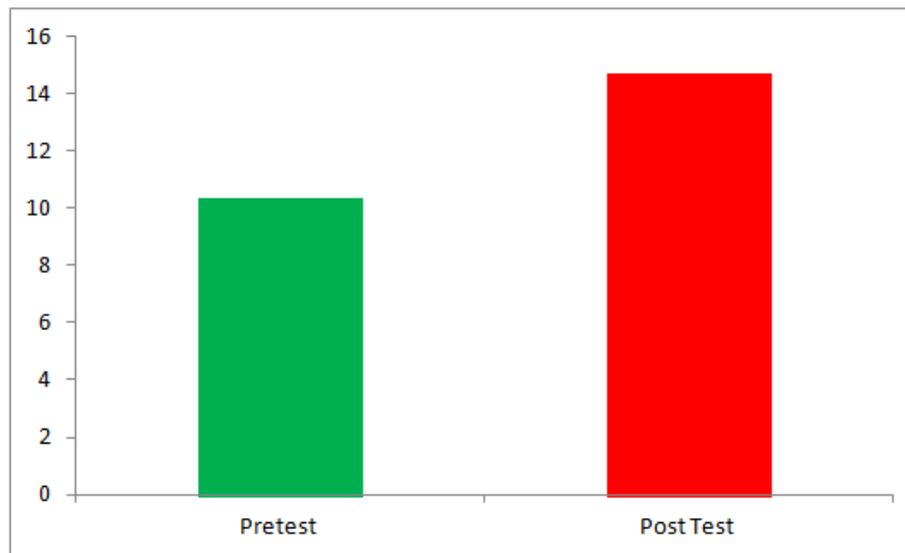


Figure 1: Shows that there was a significant increase in the mean marks scored by laboratory personnel before and after undergoing the training programme on preanalytical issues.

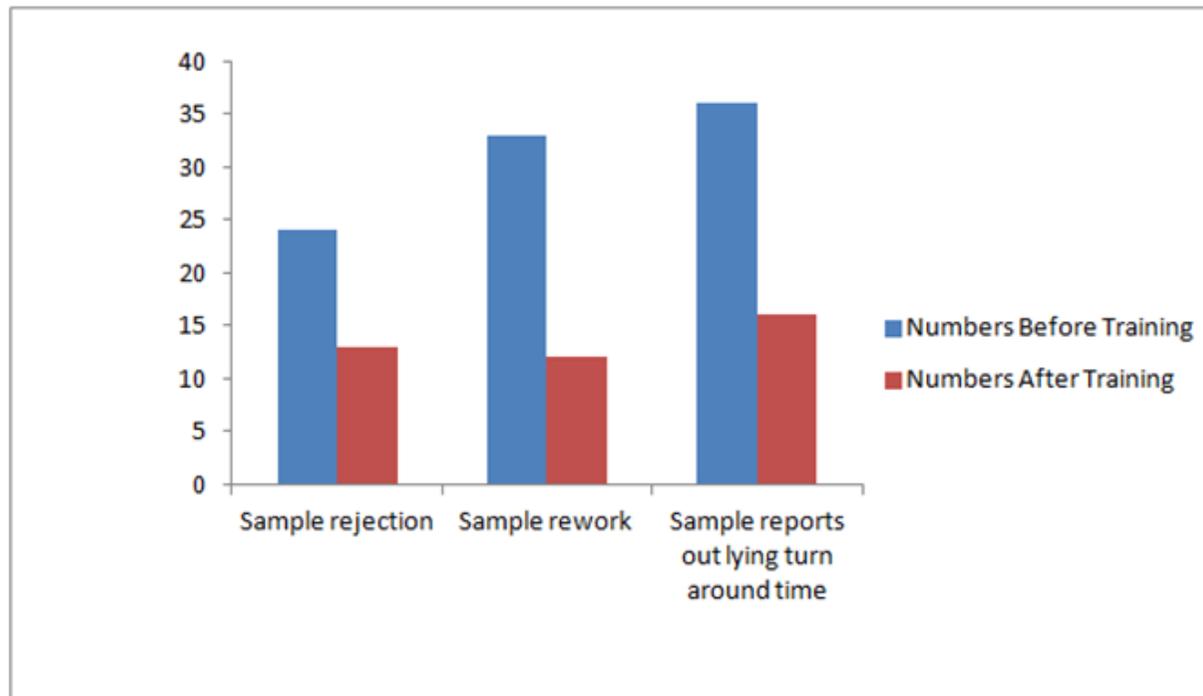


Figure 2: Shows there is a significant greater decrease in the quality indicators concerned in preanalytical phase like sample rejections, sample rework and sample outlying the turnaround time after the training given on preanalytical errors.