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Knowledge, Attitude and Practice (KAP) of Laboratory Technicians Regarding Quality Assurance in Central Diagnostic Laboratory in Tertiary Health Care Center

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ABSTRACT

INTRODUCTION: Quality assurance refers to establishing and maintaining a certain level of quality in a product or service. Therefore, quality assurance in a medical lab refers to making sure the lab is running smoothly, safely, and effectively without any errors.

MATERIAL AND METHODS: The questionnaires was used to test the knowledge , attitude and practice regarding quality assurance of 80 laboratory technicians. There were 32 knowledge, 14 attitude and 22 practice related questions. The data obtained was entered in microscoft excel sheet and statistical analysis was done. A 4 point likert's scale was used to assess the attitude of the participants.

RESULTS: The study population consists of 80 laboratory technicians out of which 58% were female and 42% male participants.A considerable lack of knowledge was seen regarding laboratory safety manual. A positive attitude was observed on all aspects of quality assurance. When practice regarding quality assurance was assessed, it was noticed that 89.9% of laboratory technicians knew the source of External Quality Assurance (EQAs) for the laboratories.A potential area of deficiency was also identified.

CONCLUSION: This study reveals a good knowledge and positive attitude regarding quality assurance in diagnostic laboratories. But a potential area of deficiency was also identified mainly due to lack of experience of the technicians.

KEYWORDS: Quality assurance, Knowledge, Attitude, Practice, Laboratory technicians

INTRODUCTION

Quality assurance refers to establishing and maintaining a certain level of quality in a product or service. Therefore, quality assurance in a medical lab refers to making sure the lab is running smoothly, safely, and effectively without any errors. The procedures performed in a medical lab can be divided into three main phases. These include:

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1. The **pre-analytical phase**, which involves obtaining patient information and taking the specimen sample
2. The **analytical phase**, which involves examining and testing the sample
3. The **post-analytical phase**, which involves analyzing the test results and creating an official report

During the pre-analytical phase, quality assurance is focused on ensuring all patient information and documentation are correct, patient information is kept confidential, and proper procedures are followed when taking the sample (such as the medical professional wearing gloves when handling samples).[1,3,4]

The quality assurance measures for the analytical phase include maintaining patient privacy and following standard operating procedures (SOPs) during the testing of the sample. This includes ensuring that the proper temperature is maintained and that the sample is not contaminated. Analyzing samples using the correct equipment, the procedure involves Internal Quality Controls and External Quality Assurances , routinely calibrating equipments are the quality assurance measures for the analytical phase. [1,3]

Maintaining patient privacy, LIS (Laboratory information systems), timely release of reports, informing critical values, storage of samples and biomedical waste management are the quality assurance measures for the post-analytical phase.

Patient privacy is a very important aspect of quality assurance in all three phases of a medical lab.[1,2,4,5]

OBJECTIVES

1. To evaluate the knowledge, attitude and practice of laboratory technicians regarding quality assurance in CDLS(Central Diagnostic Laboratories and Services) with respect to pre-analytical, analytical and post-analytical phase.

2. To identify potential areas of improvement regarding quality patient care.

3. To identify existing deficiencies with regard to KAP and to initiate remedial steps

MATERIALS AND METHODS

STUDY DESIGN : Questionnaire based study

PLACE OF STUDY : Department of Pathology, Microbiology and Biochemistry in CDLS, R. L. Jalappa Hospital and Research centre, Tamaka, Kolar

SOURCE OF DATA : Data obtained by questionnaire

INCLUSION CRITERIA : All laboratory technichians working in CDLS, R. L. Jalappa Hospital and Research centre, Tamaka, Kolar

EXCLUSION CRITERIA :No consent given for participation, incomplete response to questionnaires

The questionnaires was given to mark the answers in google forms which was used to assess the knowledge, attitude and practice about the concepts of quality assurance by laboratory technicians. The data obtained was entered in microscoft excel sheet and statistical analysis was done. Questionnaires are shown in table number 5

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STATISTICAL ANALYSIS:

All the data was entered in Microsoft Excel Sheet and statistical analysis will be done by using SPSS Software version -2024.

The continuous data was analysed using mean and standard deviation.

Categorical data was analysed by frequency and percentage.

RESULTS

The study population consists of 80 laboratory technicians out of which 58% were female and 42% male participants. The mean working experience of the lab technicians was 2.4±2.9 (range 0.5 to 15) years. KAP was analysed and percentages for each parameters were obtained. Potential area of deficiency was also identified.

Knowledge about quality assurance (Table/Figure 1)

It was observed that when the knowledge of the lab technicians on quality assurance were analysed majority of them were aware regarding the blood drawing and biomedical waste management followed routinely in laboratories.

A considerable lack of knowledge was seen regarding laboratory safety manual.

Attitude about quality assurance (Table/Figure 2)

The attitude of the laboratory technicians regarding quality assurance were positive on all aspects. 92% of laboratory technicians , strongly agree for auditing of the laboratories and non conformities to be taken care and resolved as soon as possible.

Practice about quality assurance (Table/Figure 3)

When practice regarding quality assurance was assessed , it was noticed that 89.9% of laboratory technicians knew the source of External Quality Assurance (EQAs) for the laboratories while 25 % knew regarding the calibration done for equipments in the laboratories.

DISCUSSION:

The entire quality management system of diagnostic laboratory should include training, direction, and incentive since these are essential for controlling errors and guaranteeing accurate outcomes.[6]Diagnostic information from clinical laboratory tests is crucial for medical diagnosis. A crucial element that promotes diagnostic excellence is the generation of precise and fast test results that are clearly communicated to the treating physician and, ultimately, the patient. However, failing to do so may result in diagnostic errors that show up as missing, delayed, or incorrect diagnoses.[7]

In terms of quality assurance, it is crucial to research the Knowledge, Attitude, and Practice (KAP) of laboratory technicians working in central diagnostic laboratories. 80 laboratory technicians from the

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Department of Pathology, Microbiology, and Biochemistry at the Central Diagnostic Laboratory of the R. L. Jalappa Hospital and Research Centre, Tamaka, Kolar, took part in the present study.

Laboratory technicians were given questionnaires to complete in order to gather data. The seventy-five technicians answered all of the questions. The age range of the participants was 21–40 years old, with an average age of 24.2 ± 3 years. Through a series of questions, the participants' knowledge, attitudes, and practices about quality assurance were evaluated. The results of this study showed that the laboratory technicians' understanding of quality assurance varied.

The difference in understanding highlights the need for targeted instruction and learning programs. To stay up to date on the newest accrediting criteria and procedures, laboratory technicians need to participate in continual education and professional development. Laboratory technicians have a good attitude toward quality assurance, and the majority of responders acknowledged its significance in guaranteeing high-quality medical care. Increasing knowledge of the advantages of quality assurance for both individual professional development and patient care can be a useful tactic in influencing attitudes.

The central diagnostic laboratory's organizational culture has a significant impact on the attitudes and behaviors of laboratory personnel. By raising laboratory technicians' KAP, healthcare organizations can significantly enhance patient care, reduce medical errors, and increase patients' trust in the healthcare system.

The findings from this study emphises on regular training and education, internal quality control procedures, and encouraging a culture of accountability and teamwork among laboratory technicians are a few possible improvement strategies. The laboratory staff should be consulted before implementing these suggestions, and they should be incorporated into the overall quality management system.

LIMITATION:

The laboratory technicians employed by our organization, who cannot be regarded as representatives of all healthcare providers, were the subjects of the study. As a result, the information presented can differ from person to person based on their professional background.

CONCLUSION:

This study reveals a good knowledge and positive attitude regarding quality assurance in diagnostic laboratories. But a potential area of deficiency was also identified mainly due to lack of experience of the technicians.

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TABLES / FIGURES

TABLE / FIGURE 1: Pie chart depicting the knowledge on blood drawing

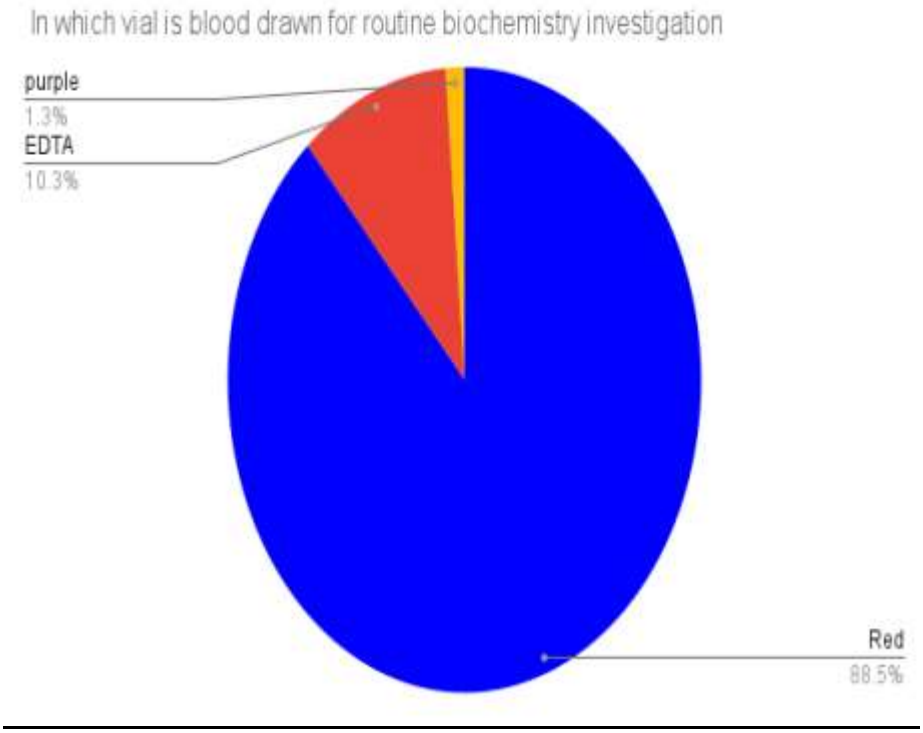

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TABLE / FIGURE 2: Bar diagram depicting the attitude of laboratory technician

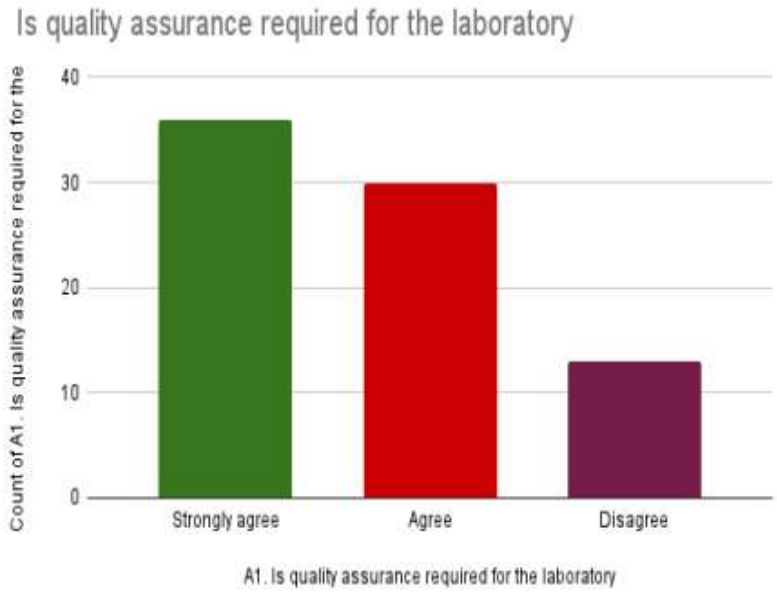

TABLE / FIGURE 3 :Pie chart depicting the practice followed in laboratory

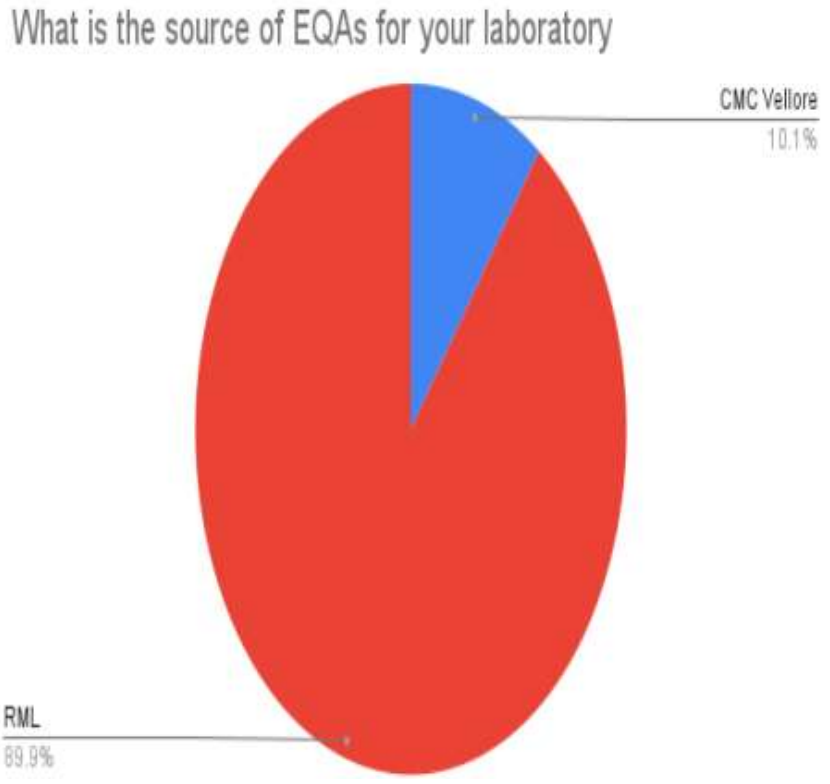

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TABLE / FIGURE 4:Pie chart depicting the practice followed by technician

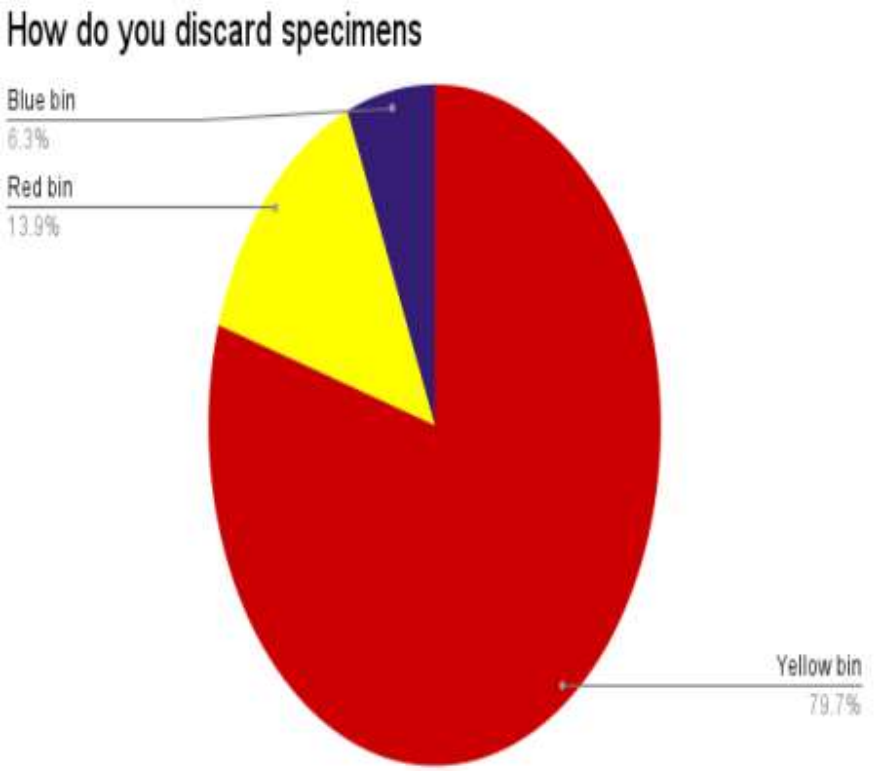

TABLE /FIGURES 5: QUESTIONNAIRE

Knowledge	Questions	Response
K 1	Do you know quality control	
K 2	Quality control and quality assurance same or different	
K 3	Expand TRF	
K 4	In which vial is blood drawn for routine hematology investigation	
K 5	In which vial is blood drawn for routine biochemistry investigation	
K 6	In which vial is blood drawn for blood sugar estimation	
K 7	Expand NABL	
K 8	Do you know the order of blood drawing	
K 9	Expand QMS	
K 10	Do you have document control protocol	
K 11	Name the referral laboratory for your laboratory	
K 12	Are you aware of vendor evaluation	

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K 13	Do you have proper storage facility in your laboratory	
K 14	Expand NC	
K 15	Do you maintain critical alertregister	
K 16	How do you resolve NC	
K 17	Do you have regular technician training program	
K 18	Do you have internal audit	
K 19	What is MRM	
K 20	Expand IQC and EQAs	
K 21	Do you know what is closed system of drawing blood	
K 22	Do you know the ethics in laboratory practices	
K 23	Are you aware of lot to lot verification in laboratory	
K 24	Do you have laboratory safety manual	
K 25	Expand TAT	
K 26	Are you aware of critical values in laboratory	
K 27	Expand AMC	
K 28	Expand CMC	
K 29	Expand IQ, OQ, PQ	
K 30	What is ILC	
K 31	Do you have knowledge regarding biomedical waste management	
K 32	Are reports stored in your laboratory	

ATTITUDE	QUESTIONS	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
A 1	Is quality assurance required for the laboratory				
A 2	Is EQAs required for the laboratory				
A 3	Is accreditation of the laboratory done by external organisation required				
A 4	Is referral laboratory required for a good laboratory				
A 5	Should the NC be taken care and resolved				
A 6	Should the feedback be taken from stakeholders of the laboratory				
A 7	Does the laboratory need continued improvement				

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A 8	Does the laboratory need auditing				
A 9	Does your laboratory provide good accommodation and environment to laboratory personnel				
A 10	Is SOP required in the laboratory				
A 11	Is LIS required for the laboratory				
A 12	Is regular technicians training required in the laboratory				
A 13	Should technicians dress neatly with uniform and name plate				
A 14	Is knowledge of ethics required for technicians working in laboratory				

PRACTICE	QUESTIONS	RESPONSE
P 1	Do you have SOP in your laboratory	
P 2	Expand SOP	
P 3	Do you have primary sample manual	
P 4	Do you have LIS manual in your laboratory	
P 5	How do you draw the blood in closed / open system	
P 6	How do you transport the samples from ward to laboratory	
P 7	How do you use LIS for laboratory reports	
P 8	What is the source of EQAs for your laboratory	
P 9	How do you discard paper	
P 10	How do you discard syringe with blood	
P 11	How do you discard specimens	
P 12	Do you practice in EQAs	
P 13	Do you maintain patient confidentiality	
P 14	Is calibration done for equipments your in laboratory	
P 15	Do you maintain equipment file with down time	
P 16	Do you have IQ, OQ and PQ for the instruments in your laboratory	
P 17	Do you have training certificates for equipments in your laboratory	
P 18	Do you have AMC / CMC for the instruments in your laboratory	
P 19	Do you have quality indicators for your laboratory	
P 20	How do you discard urine samples after test	
P 21	What is the temperature at which you store the samples	
P 22	Where are the reports stored in your laboratory	