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Knowledge Attitudes and Practices Regarding the Effect of a Structured Training Program on Laboratory Specialists' Compliance with Complete blood Count Quality Control Protocols in Wad Medani, Gezira state, Sudan (2026)

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Abstract: Introduction: *Quality Control in Complete Blood Count procedures is essential for clinical decision-making; however, laboratory specialists in Wad Medani, Gezira State, Sudan, often face challenges in maintaining standardized Quality Control protocols due to varying resource settings and experience gaps.* ***Aim:*** *To assess the impact of a structured training program on laboratory specialists' knowledge, attitudes, and practices regarding Complete Blood Count quality control protocols.* ***Methodology:*** *A quasi-experimental (pre/post-intervention) study conducted from January to May 2026, evaluating 132 responses (82 specialists pre-intervention and 50 post-intervention) using SPSS.* ***Results:*** *The findings revealed that the study population was predominantly female (66.0%) and consisted of young professionals aged 25–34 years (82.0%) with a diverse background in Complete Blood Count testing experience. Following the intervention, a significant improvement in practical compliance and technical accuracy was observed; in the Practice domain, "Good" practice levels increased from 36.0% to 44.0%, while "Poor" practices dropped significantly (P=0.021). Significant advancements in technical decision-making were also recorded, as correct responses for statistical target ranges improved from 64.0% to 82.0% (P=0.013), and knowledge of corrective actions for out-of-range results reached 80.0% (P=0.029). Furthermore, compliance with documentation protocols in Questions Number (27, 29, 30) showed significant improvements, embedding proactive verification into daily laboratory workflows (P<0.05). Although the knowledge mean score showed a significant decline (P=0.046), this was attributed to a "response shift," as participants developed a more critical and accurate self-assessment of their knowledge following the training.* ***Conclusion:*** *The structured training effectively standardized practical skills and bridged experience gaps, ensuring documented CBC control stability vital for patient safety.*

Keywords: Complete Blood Count, Quality Control Protocols, Laboratory Specialist, Compliance, Structured Training Program, Knowledge, Attitude, Practices, Sudan.

INTRODUCTION

The complete blood Count is one of the most frequently requested and essential laboratory investigations in clinical medicine. It provides comprehensive information about blood components including red blood cells, white blood cells, and platelets, which are important for diagnosing, monitoring, and managing conditions such as anemia, infections, inflammatory disorders, hematological malignancies, and systemic diseases [1].

Technological advancements have transformed hematology laboratories from manual Counting to automated analyzers using electrical impedance, optical light scatter, and flow cytometry for rapid and accurate analysis [3]. Modern analyzers generate histograms and scattergrams, providing insights into cell morphology and distribution. Quality control is essential to ensure accuracy and reliability in laboratory testing. Internal quality control, external quality assessment, calibration, preventive maintenance, and interpretation of analyzer flags are all critical components. Internal quality control involves routine analysis of control materials to verify instrument performance and detect errors, while external quality control allows comparison between laboratories [6, 7].

The complete blood Count is indispensable in anemia diagnosis by detecting nutritional and disease related anemia, in infection detection by white blood cell Counts and differentials, in bleeding disorders by platelet Counts, and in monitoring therapy by tracking chemotherapy and drug induced cytopenias. In Sudan, where malaria and nutritional deficiencies are prevalent, the complete blood Count is often the first diagnostic step in patient management, made accessible even in rural hospitals due to its affordability [1].

However, ensuring the accuracy and reliability of laboratory results remains a major challenge in many healthcare settings, particularly in developing Countries.

Despite the availability of modern hematology analyzers, many laboratories face difficulties in maintaining consistent compliance with quality control protocols due to inadequate training, limited resources, high workload, and insufficient awareness [2, 7].

In Sudan, and specifically in Wad Medani, Gezira State, there is a lack of documented data regarding the level of knowledge, attitudes, and practices of laboratory specialists toward complete blood Count quality control procedures. Poor adherence to quality control protocols can compromise the accuracy of results, leading to diagnostic errors and negatively affecting patient outcomes. Structured training programs are recognized as effective strategies for improving laboratory professional's competencies by enhancing knowledge, promoting positive attitudes, and improving adherence to quality control protocols. Studies have demonstrated that training interventions can significantly improve laboratory performance and reduce analytical errors [4].

This study is justified by the need to evaluate current knowledge, attitudes, and practices levels among laboratory specialists, identify gaps in practice, and determine the effectiveness of training interventions in improving compliance with complete blood Count quality control protocols.

To address these critical gaps, this study aims to assess the impact of a structured training program on laboratory specialists' knowledge, attitudes, and practices regarding CBC quality control protocols in Wad Medani clinical laboratories using the KAP framework. Specifically, the research evaluates laboratory specialists' baseline knowledge of CBC quality control resources and guidelines prior to training. It also examines specialists' attitudes toward protocol adherence and perceived barriers to compliance before and after training. Furthermore, the study assesses changes in specialists' practices during CBC testing including calibration, documentation, and control procedures following the training intervention.

Additionally, it identifies behavioral and contextual factors influencing compliance across public, private, and academic laboratories. Ultimately, this work intends to recommend evidence-based strategies for improving specialist behavior and CBC test quality in diverse laboratory environments.

METHODOLOGY

This study adopted a quasi-experimental, pre-post interventional design to assess the effect of a structured training program on laboratory specialists' compliance with complete blood Count (CBC) quality control protocols. This design was chosen due to its effectiveness in measuring the impact of educational interventions within a short period of time. The research was conducted in Wad Medani, the capital city of Gezira State, Sudan, which serves as a major medical and urban hub hosting numerous public, private, and academic healthcare facilities and diagnostic laboratories. These laboratories are fully equipped with automated hematology analyzers performing routine CBC tests and implementing standard quality control procedures. The study spanned a period of five months, from January 2026 to May 2026, which encompassed the phases of questionnaire distribution, pre-training data collection, implementation of the training program, post-training data collection, data analysis, and report writing.

The target study population consisted of laboratory specialists working in medical laboratories within Wad Medani, Gezira State. A convenience sampling technique was utilized to recruit participants through academic and professional laboratory networks in Wad Medani, and the structured questionnaire was distributed electronically via Google Forms. To determine the target sample size, the standard Cochran formula for cross-sectional and observational frameworks was applied:

$$n = \frac{Z^2 P (1-P)}{d2} \quad (1)$$

Where **n** represents the required sample size, **Z** is the standard normal deviation set at 1.96 for a 95% confidence level, **P** is the estimated prevalence set at 0.5 due to the absence of prior localized baseline data, and **d** is the margin of error set at 0.05. Based on this formula, the theoretical minimum sample size required was 384 participants. However, the final longitudinal study sample comprised 132 completed assessments; a total of 82 medical laboratory specialists completed the pre-intervention questionnaire, and a localized cohort of 50 specialists was successfully retained and monitored through the post-intervention follow-up. This headcount of 132 responses was methodologically justified and deemed sufficient due to strict inclusion criteria, study time constraints, and the typical loss to follow-up observed among active clinical staff.

Strict eligibility criteria were enforced to select the participants. The inclusion criteria required individuals to be laboratory specialists currently working in hematology sections, actively involved in performing CBC tests, and who agreed to participate in the study. Conversely, the exclusion criteria ruled out laboratory personnel not involved in CBC testing, as well as individuals who submitted incomplete questionnaire responses or did not attend the training program. The study managed both dependent and independent variables. The dependent variables consisted of the cumulative scores and levels of knowledge, attitude, and practices (KAP), while the independent variables included the 2026 structured training intervention, socio-demographic factors such as age, gender, and experience, and the workplace environment classified into public, private, or academic settings.

Data collection relied on a structured, self-administered questionnaire designed to assess KAP regarding CBC quality control. The questionnaire consisted of three main sections. The knowledge section comprised 11 multiple-choice items assessing the understanding of QC principles, internal QC, calibration, and maintenance. The attitude section included 6

items measured using a five-point Likert scale ranging from strongly agree to strongly disagree, which assessed perceptions toward the importance of QC. The practice section contained 9 items evaluating routine QC practices and self-reported behaviors related to running QC, documentation, and handling abnormal results. The structured training program was developed and delivered to improve compliance with CBC quality control protocols. The training content covered principles of quality control in hematology, internal and external QC procedures, calibration techniques, routine maintenance of hematology analyzers, interpretation of flags and warning messages, and common laboratory errors and troubleshooting. Delivered through lectures, interactive discussions, practical examples, and case scenarios, the intensive program was conducted over three days. The overall data collection was executed in three consecutive steps: distribution of the questionnaire before the training program as a pre-test, implementation of the structured training program, and distribution of the same questionnaire after the training program as a post-test. Participants were provided with clear instructions on how to complete the questionnaire, and confidentiality was maintained throughout.

The data obtained were entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. A standardized scoring system was applied where knowledge items were scored as 1 for a correct answer and 0 for an incorrect answer. Attitude items were scored on a Likert scale where strongly agree equaled 5, agree equaled 4, neutral equaled 3, disagree equaled 2, and strongly disagree equaled 1. Practice items were scored as 1 for yes and 0 for no. The cumulative scores were categorized into levels defined as good for scores equal to or greater than 75%, fair for scores between 50% and 74%, and poor for scores equal to or less than 50%. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. Inferential statistics were applied to compare pre- and post-intervention results: a paired t-test was used to compare the pre- and post-intervention mean scores of KAP domains, with a p-value of less than 0.05 considered statistically significant. A one-way ANOVA was utilized to compare post-intervention KAP mean scores across different groups, and a Chi-square test was executed to determine the association between questionnaire variables. Multiple responses cross-tabulation was also implemented to analyze questionnaire items with multiple-choice options.

Ethical approval for this study was officially obtained from the University of Gezira Ethical Committee prior to data collection. Participation was entirely voluntary, and verbal informed consent was secured from all laboratory specialists after thoroughly explaining the study's objectives and their right to withdraw at any stage without penalty. To guarantee strict anonymity and confidentiality, all collected data were handled responsibly, securely stored on password-protected platforms, and utilized solely for academic research purposes. No identifying personal details, such as names or phone numbers, were recorded in the final dataset. The technical materials utilized in this study included a computer with internet access for questionnaire development and data management, the Google Forms platform for electronic data collection, and SPSS version 20 for all statistical data analysis. Finally, certain study limitations were noted, including the short duration of the study which limited the ability to assess long-term changes in practice, a reliance on self-reported data which may introduce response bias, and a limited sample size that may affect the generalizability of the results.

RESULTS

Demographic and Professional Characteristics of Participants

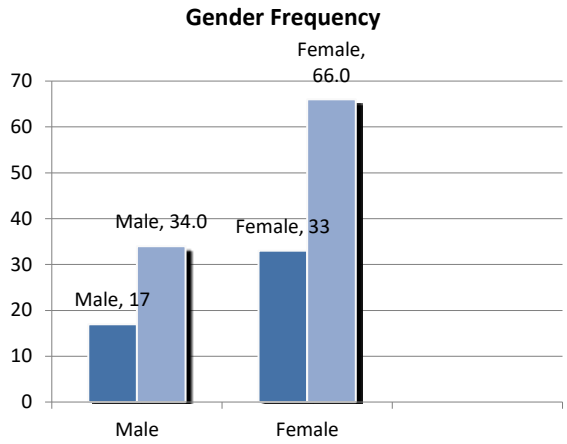


Fig.1. Distribution of Participants by Gender (n = 50)

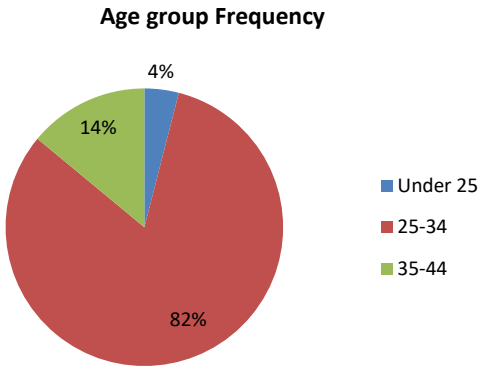
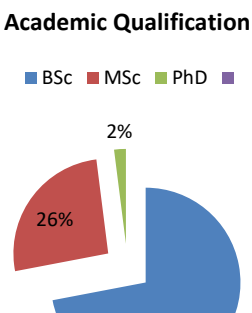


Fig.2. Distribution of Participants by Age Group (n = 50)



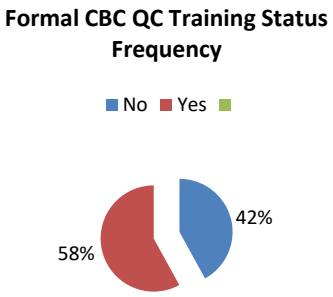


Fig.3. Distribution of Participants by Academic Qualifications (n = 50)

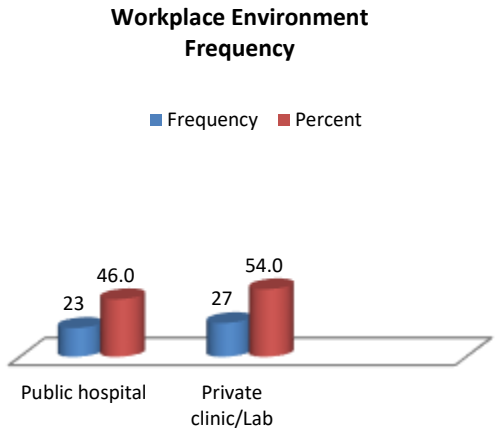


Fig.4. Distribution of Participants by Workplace Environment (n = 50)

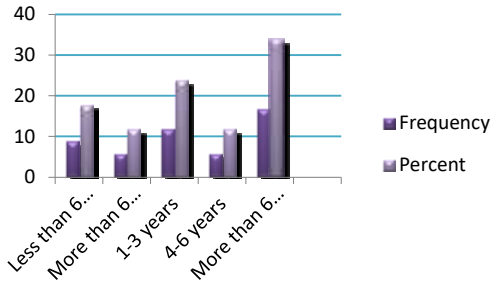


Fig.5. Distribution of Participants by CBC Testing Experience (n = 50)

Fig.6. Distribution of Participants by History of Formal Training in CBC QC Protocols (n = 50)

Comparative Distribution of KAP Levels

Table 1: Comparative Distribution of Knowledge Levels Regarding CBC Quality Control Standards Pre- and Post-Training Intervention (n=50)

			Phase of Response		Total
			Before Training	After Training	
Knowledge Level	Poor	Count	9	12	21
		%	18%	24%	21%
	Fair	Count	31	33	64
		%	62%	66%	64%
	Good	Count	10	5	15
		%	20%	10%	15%
Total		Count	50	50	100
		%	100%	100%	100%

Table 2: Comparative Distribution of Attitude Levels Towards Quality Control Standards Pre- and Post-Training Intervention (n=50)

	Phase of Response		Total
	Before Training	After Training	

Attitude Level	**Poor**	**Count**	7	8	15
		%	14%	16%	15%
	Fair	**Count**	25	23	48
		%	50%	46%	48%
	Good	**Count**	18	19	37
		%	36%	38%	37%
Total		**Count**	50	50	100
		%	100%	100%	100 %

Table 3: Comparative Distribution of Practical Laboratory Practice Levels Pre- and Post-Training Intervention (n=50)

			Phase of Response		**Total**
			Before Training	**After Training**	
Practice Level	**Poor**	**Count**	16	10	26
		%	32%	20%	26%
	Fair	**Count**	16	18	34
		%	32%	36%	34%
	Good	**Count**	18	22	40
		%	36%	44%	40%
Total		**Count**	50	50	100
		%	100%	100%	100 %

Table 4: Paired Samples T-Test Results Comparing Pre- and Post-Intervention Mean Scores of KAP Domains (n=50)

Domain	**phase**	**Mean**	**Std. Deviation**	**P-value**
Knowledge	**Pre-Test**	18.18	2.826	0.046 Statistically significant
	Post-Test	17.16	2.542	
Attitude	**Pre-Test**	18.08	3.319	0.624
	Post-Test	18.38	3.533	
Practice	**Pre-Test**	25.84	7.127	0.021 Statistically significant
	Post-Test	28.22	6.102	

Table 5: One-Way ANOVA Results Comparing KAP Mean Scores by Years of Experience (n=50)

Domain	**Years of Experience**	**N**	**Mean**	**Std. Deviation**	**P-Value**
Knowledge	**Less than 6 months**	9	19.67	2.872	0.014 Statistically significant
	More than 6 months	6	16.50	.837	
	1-3 years	12	16.08	2.429	
	4-6 years	6	17.17	3.488	
	More than 6 years	17	16.82	1.704	
	Total	50	17.16	2.542	

Attitude	**Less than 6 months**	9	16.78	4.295	0.407
	More than 6 months	6	19.00	2.608	
	1-3 years	12	18.75	3.596	
	4-6 years	6	17.00	3.847	
	More than 6 years	17	19.24	3.192	
	Total	50	18.38	3.533	
Practice	**Less than 6 months**	9	28.78	6.300	0.986
	More than 6 months	6	28.83	9.131	
	1-3 years	12	28.17	6.860	
	4-6 years	6	27.00	3.406	
	More than 6 years	17	28.18	5.593	
	Total	50	28.22	6.102	

Table 6: One-Way ANOVA Results Comparing KAP Mean Scores by Lab Type (n=50)

Domain	Lab Type	N	Mean	Std. Deviation	P-Value
Knowledge	**Public hospital**	23	18.09	2.172	0.016 Statistically significant
	Private clinic /Lab	27	16.37	2.604	
	Total	50	17.16	2.542	
Attitude	**Public hospital**	23	18.43	3.603	0.921
	Private clinic /Lab	27	18.33	3.541	
	Total	50	18.38	3.533	
Practice	**Public hospital**	23	28.61	6.479	0.682
	Private clinic /Lab	27	27.89	5.866	
	Total	50	28.22	6.102	

Comparative Analysis of Knowledge Dimension (n = 50)

Table 7: Selective Key Knowledge Items Displaying Statistically Significant Improvement Post-Training (n = 50)

Q No.	Research Question/ Metric	Correct Option	Pre-Test Correct	Post-Test Correct	Chi-Square(\chi^2)	P-value
Q 11	Optimal Performance Timing	Within 1hour	37 (74.0%)	28 (56.0%)	8.287	0.040 Statistically significant
		Within 4hours	5 (10.0%)	13 (26.0%)		

Q 14	Statistical Target Range	Within ±2SD	32 (64.0%)	41 (82.0%)	8.627	0.013 Statistically significant
Q 17	Action for Out-of-Range(>±3SD)	Repeat run immediately	26(52.0%)	40(80.0%)	9.027	0.029 Statistically significant

Table 8: Multiple Response Analysis of Systemic Barriers Affecting QC Compliance (n = 50)

Systemic Barrier	Pre-Test (n, %)	Post-Test (n, %)
1. Lack of trained staff	22(44.0%)	14(28.0%)
2. High workload / Time constrain.	29(58.0%)	25(50.0%)
3. Unavailability of QC materials/Reagents	33(66.0%)	31(62.0%)
4. Lack of management support / Oversight	11(22.0%)	9(18.0%)
5. Clear protocols are not available	15(30.0%)	5(10.0%)

Comparative Analysis of Practice Dimension (n = 50)

Table 9: Key Laboratory Practice Items Displaying Statistically Significant Behavioral Improvement Post-Training (n = 50)

Question	Phase Response	Always (5)	Often (4)	Sometimes (3)	Rarely (2)	Never (1)	Chi-Square (\chi^2)	P-value
Q27: I run and document internal control samples	Pre	19 (38.0%)	5 (10.0%)	8 (16.0%)	3 (6.0%)	15 (30.0%)	10.445	**0.0336** (Statistically Significant)
	Post	22 (44.0%)	10 (20.0%)	13 (26.0%)	1 (2.0%)	4 (8.0%)		
Q29: I review and sign QC logs regularly	Pre	12 (24.0%)	3 (6.0%)	8 (16.0%)	7 (14.0%)	20 (40.0%)	9.505	**0.050** (Statistically Significant)
	Post	13 (26.0%)	10 (20.0%)	13 (26.0%)	5 (10.0%)	9 (18.0%)		
Q30: I consistently record CBC and QC results	Pre	18 (36.0%)	5 (10.0%)	14 (28.0%)	4 (8.0%)	9 (18.0%)	10.473	**0.033** (Statistically Significant)
	Post	23 (46.0%)	14 (28.0%)	6 (12.0%)	1 (2.0%)	6 (12.0%)		

DISSCUSSION

This is a pre- and post-intervention study which aimed to determine the impact of a structured training program on laboratory specialists' Knowledge, Attitudes, and Routine

Practices (KAP) regarding CBC quality control protocols in Wad Medani, Gezira State, Sudan.

The study population was predominantly female (66.0%) and young professionals aged 25–34 years (82.0%), with 72.0% holding a Bachelor of Science degree. Regarding professional background, participants displayed diverse CBC testing experience, with the largest cohort being highly experienced (more than 6 years, 36.0%). Furthermore, 58.0% reported prior formal training in CBC QC, while 42.0% reported no such training. Participants were balanced between private (54.0%) and public (46.0%) sectors.

In the Knowledge domain, the results showed that the "Fair" level remained predominant, and increasing from 62.0% pre-test to 66.0% post-test. The mean knowledge score showed a significant decline (p=0.046), this finding maybe attributed to a "response shift" where rigorous training dismantled baseline overconfidence, leading participants to a more critical and accurate self-assessment of their knowledge.

Regarding the Attitude domain, the study found that the "Good/Positive" level grew from 36.0% pre-test to 38.0% post-test. The mean attitude score showed no significant variation (p=0.624), reflecting a stable and constructive professional conviction toward patient safety.

In the Practice domain, the results demonstrated that the "Good" level improved from 36.0% to 44.0%, while "Poor" practices dropped significantly from 32.0% to 20.0%. The mean practice score showed significant improvement (p=0.021), which is attributed to the technical orientation of the training, empowering specialists to master hematology analyzer calibrations.

The results comparing post-intervention scores by years of experience, a statistically significant difference was found in Knowledge scores ($F = 3.491$, $p = 0.014$), where newly recruited specialists achieved the highest scores, suggesting that length of employment correlates with cognitive absorption this study found that the public hospital specialists demonstrated superior theoretical assimilation ($p = 0.016$). However, in both analyses, Attitude and Practice scores remained homogeneous, proving that the training successfully standardized practical skills across different professional backgrounds and sectors.

This results reveal that the correct response for optimal performance timing (Q11) showed a significant redistribution (p=0.040), indicating a transition from rigid theoretical memorization to a pragmatic understanding of sample stability.

Furthermore, it was found that correct responses for statistical target range (Q14) improved from 64.0% to 82.0% (p=0.013), and action for out-of-range (Q17) improved from 52.0% to 80.0% (p=0.029). These findings imply that this study intervention effectively eliminated technical hesitation.

Finally, it was observed that adherence to internal control (Q27) improved significantly (p=0.0336), QC log verification (Q29) improved (p=0.050), and high adherence to consistent recording of CBC results (Q30) increased to 74.0% (p=0.033). These results confirm that the training successfully fostered an advanced systemic adaptation, where technicians internalized the clinical necessity of documented control stability.

The primary strength of this study lies in its independent execution. By conducting the research, data collection, and analysis personally, the study ensured high procedural uniformity and minimized inter-observer variability, providing a consistent and focused evaluation of the training program's impact in a real-world setting.

CONCLUSION

The evaluation of the training program demonstrated significant operational and technical advancements across a diverse cohort of professionals. The intervention successfully enhanced participants' critical self-assessment of their knowledge and resulted in substantial improvements in hands-on practices, technical competencies—such as statistical target range identification and rapid decision-making—and overall compliance regarding internal control documentation and routine quality control (QC) reviews. Furthermore, the findings indicate that the program effectively standardized practical skills and embedded compliance protocols into daily workflows, thereby successfully bridging pre-existing experience gaps across varying educational levels and workplace environments.

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Appendix A

Questionnaire

Knowledge Attitudes and Practices Regarding The Effect of a Structured Training Program on Laboratory Specialists' Compliance with Complete Blood Count (CBC) Quality Control Protocols in Wad Medani, Gezira state, Sudan, **2026**

This questionnaire is part of a postgraduate research study from the University of Gezira. Your participation is voluntary and anonymous. Information collected will be used solely for academic purposes. Kindly read each item carefully and select the option that best represents your experience.

Please indicate the phase of response:

- Before Training
- After Training

ID CODE NO: ____

Section A: Demographic Information

1. What is your gender?

☐ Male
☐ Female

2. What is your age group?

☐ Under 25
☐ 25–34
☐ 35–44
☐ 45 and above

3. What is your highest education level?

☐ Diploma
☐ BSc
☐ MSc
☐ PhD

4. What type of laboratory do you work in?

☐ Public hospital
☐ Private clinic
☐ Academic/university lab

5. How many years of experience do you have performing CBC tests?

☐ Less than 1 year
☐ 1–3 years
☐ 4–6 years
☐ More than 6 years

6. Have you received formal training in CBC quality control protocols (e.g., SOPs, workshops)?

☐ Yes
☐ No

7. Do you regularly perform CBC tests?

☐ Yes
☐ No

Section B: Knowledge

8. What is the full meaning of CBC?

☐ Complete Blood Count
☐ Comprehensive Blood Chemistry
☐ Cell Blood Calculation
☐ Not sure

9. Which parameters are included in a standard CBC test? (Select all that apply)

☐ Hemoglobin (Hb)
☐ Hematocrit (HCT)
☐ Platelet count
☐ Blood urea nitrogen

10. What is the recommended anticoagulant for CBC samples?

☐ Heparin
☐ Sodium citrate
☐ EDTA
☐ No anticoagulant needed

11. After sample collection, when should a CBC ideally be performed for accurate results?

☐ Within 1 hour
☐ Within 4 hours
☐ Within 12 hours
☐ It doesn't matter

12. What is the main purpose of quality control in CBC testing?

☐ To save reagents
☐ To calibrate the machine
☐ To ensure accuracy and reliability
☐ To speed up testing

13. How often should Internal Quality Control (IQC) be conducted?

☐ Weekly
☐ Monthly
☐ Daily or with each batch
☐ Only when errors are suspected

14. What is the acceptable range for QC results?

☐ ±1 SD
☐ ±2 SD
☐ ±3 SD
☐ Not sure

15. Which of the following documents have you read completely? (Select all that apply)

☐ WHO Blood Safety Manual – CBC QC chapter
☐ Sudan MOH CBC QC SOP
☐ Instrument vendor's QC guide
☐ None of the above

16. Which QC step must be performed before every CBC test?

☐ Instrument calibration
☐ Running control samples
☐ Checking Levey-Jennings charts
☐ Checking reagent expiry

17. If a control sample result falls beyond ±3 SD, what action should be taken?

☐ Proceed with patient samples
☐ Repeat the control run immediately
☐ Call engineer directly
☐ Consult lab manager

18. How often should QC logs be reviewed and signed?

☐ Every shift
☐ Daily

☐ Weekly
☐ Monthly

Section C: Attitudes

(Rate your level of agreement: 1 = Strongly Disagree → 5 = Strongly Agree)

19. Performing daily QC checks is vital to patient safety
1 2 3 4 5

20. Skipping QC during high workload is acceptable
1 2 3 4 5

21. I feel confident interpreting Levey-Jennings charts
1 2 3 4 5

22. My lab's QC protocols are clear and easy to follow
1 2 3 4 5

23. Management supports time spent on QC activities
1 2 3 4 5

24. What barriers affect your compliance with QC protocols? (Select all that apply)
☐ Reagent shortages
☐ Staff shortage
☐ Lack of refresher training
☐ Unclear SOPs
☐ No barriers

Section D: Practices

(Rate the frequency of each practice: 1 = Never → 5 = Always)

25. I calibrate the hematology analyzer before CBC testing
1 2 3 4 5

26. I check and record reagent expiry dates
1 2 3 4 5

27. I run and document internal control samples
1 2 3 4 5

28. I plot control results on Levey-Jennings charts
1 2 3 4 5

29. I review and sign QC logs regularly
1 2 3 4 5

30. I consistently record CBC and QC results
1 2 3 4 5

31. How are CBC and QC results documented in your lab?
☐ Electronically (e.g., LIMS)
☐ On paper logbook
☐ Not documented consistently

32. If a QC result is out of range, I usually:
☐ Repeat run immediately
☐ Troubleshoot according to SOP
☐ Notify supervisor
☐ Continue testing without action

33. How often do you participate in External Quality Assurance (EQA) programs for CBC?
☐ Regularly
☐ Occasionally
☐ Never
☐Not available in my lab

Section E: Feedback

34. What challenges do you face in performing CBC or maintaining quality control?
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35. What improvements would you recommend for better CBC practice in your laboratory?
