Dedication

For my parents for their kind

To my wife and my children (Mohamed Elmontaser, Sohaib & Khabab) for their patience

To my brother, sisters, friends and colleagues

For their encouragement and support

And every one helped me.

Acknowledgement

Thanks must first be given to Allah, for giving me health, strength, and power to achieve this work and to make my dream real.

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Abstract

The aim of this study is to evaluate the efficiency and calibration of laboratories, spectrophotometers according to the specification (ISO 15189) and depending on the conditions (4.2.5 and 5.3.2) included in the items of laboratory equipment.

At the beginning, structured questioner was conducted to assess the technician's awareness of instruments calibration. The practical results were analyzed by using Statistical package for social service (SPSS 15).

The study was applied on 40 spectrophotometers, which were calibrated by using special tools to show: the efficiency of filters to light, the severity of an accurate light degree and the ability of instrument to reach a temperature between (25±0.2°C and 37± 0.2°C) and which has a direct impact on clinical readings of instruments.

The analysis procedure showed that a significant improvement (by 100% and $p > 0.05$) in results after calibration, which was evaluated by using the probability of obtaining a test statistic (p-value) in T test, for example the obtained results before calibration: in filter 340 nm($P < 0.012$) with percentage average 43.9%, the temperature within range 25±0.2°C ($P < 0.001$) with percentage average 8.3%, the temperature within 37± 0.2°C ($P < 0.001$) with percentage average 0.00%, and the degree of an accurate lamp without a filter 172 nA ($P < 0.001$) with percentage average 30.8%, which leads to conclude that a process of calibration of instruments must be performed at frequent intervals due to its importance in enhancement the clinical results.

ستـــخـلـص

الهدف من هذه الدراسة تـ قييم كفاءة ومعايرة أجهزة الطيف الضوئى بالمعامل وف قا لمواصفة (ISO-15189) لمنظمة المعايير الدولية اعتمادا على الشرطين (4.2.5 و 5.3.2) المضمنة فى بنود اجهزة المعامل.

و قد أجريت الدراسة على عدد (40) جهاز طيف ضوئى بعد اجراء استبيان لتـ قنىيى المعامل, وكان الهدف العام منها تـ قييم مدى معرفة التـ قنيين بأسس معايرة الأجهزة وخصوصاً كفاءة مرشحات الضوء، و شدة استضاءة المصباح درجة ومـ قدرة الجهازة للوصول لدرجة حرارة بين (±0.2°25 C و ±0.2°37 C) و ذلك لاهميتها المباشرة على تغيير قراءات الاجهزة .

فى البدء تم جمع البيانات قبل وبعد اجراء المعايرة و تم تحليلها باستخدام برنامج التحليل الإحصائي (SPSS-15)، وأظهرت نتيجة التحليل فر قا تحسنا بنسبة 100% (p < 0.05) بعد المعايرة بأستخدام الفرق فى الـ قيمة الاحتمالية للنتيجة الموضوعة فى الاختبار (p-value) وعلى سبيل المثال بعض النتائج قبل المـ عايرة: للمر شح (340 (P < 0.012 nm, والنسبة المئوية له 43.9%و درجة الحرارة فى±0.2°0.001 > P) 25 C) والنسبة المئوية لها 8.3% و درجة الحرارة فى درجة ±0.2°0.001 > P) 37 C) والنسبة المئوية لها 0.00% و درجة استضاءة المصباح بدون فلتر 172 0.001 > P) nA) والنسبة المئوية له 30.8% ، مما استوجب ا قتراح ان تتم عملية المعايرة على الأجهزة فى فترات محددة و متـ قاربة نظرا للتغيرات البيئة و التذبذب فى التيار الكهربائى فى السودان، مما يؤثر سلبا في تغيير النتائج الطبية المستخرجة بهذه الاجهزة.