

**Kurdistan Regional Government- Iraq**  
**Ministry of Higher Education & Scientific Research**  
**Salahaddin University – Erbil**  
**Directorate of Higher Education & Postgraduate Studies**  
**Physics Department**



## **Toxicity Impact of Inhaling a Hookah on Level of White Blood Cells of Human Blood Samples**

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**(2023-2024)**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

الَّذِينَ يَتَّبِعُونَ الرَّسُولَ النَّبِيَّ الْأُمِّيَّ الَّذِي يَجِدُونَهُ مَكْتُوبًا عِنْدَهُمْ فِي التَّوْرَةِ وَالْإِنْجِيلِ يَأْمُرُهُمْ

بِالْمَعْرُوفِ وَيَنْهَاهُمْ عَنِ الْمُنْكَرِ وَيُحِلُّ لَهُمُ الطَّيِّبَاتِ وَيُحَرِّمُ عَلَيْهِمُ الْخَبَائِثَ وَيَضَعُ عَنْهُمْ

إِصْرَهُمْ وَالْأَغْلَالَ الَّتِي كَانَتْ عَلَيْهِمْ (١٥٧)

## Supervisor Certificate

This research project has been written under my supervision and has been submitted for the award of the degree of BSc. in (Physics).

Signature:

Name: Prof. Dr. Asaad H. Ismail

Date: 4 / 4 /2024

I confirm that all requirements have been completed.

Signature:

Name: Prof. Dr. Asaad H. Ismail

Head of the Department of Physics

Date : 4 / 4 /2024

## **Defecation**

**This project is dedicated to:**

- **Allah Almighty, my Creator, and my Master,**
- **My great parents, who never stop giving of themselves in countless ways,**
- **My beloved brothers and sisters;**
- **To all my family, the symbol of love and giving,**
- **My friends who encourage and support me,**
- **All the people in my life who touch my heart.**

## **Acknowledgements**

I wish to thank teachers who were more than generous with their support, expertise, and precious time. A special thanks to Prof. Dr. Asaad Hamid Ismail my supervisor for his countless hours of reflecting, reading, encouraging, and most of all his patience throughout the entire process, and who has been always generous during all phases of the research.

I am grateful to some people, who worked hard with me from the beginning until the completion of the present research particularly. I owe a deep debt of gratitude to the physics department and Salahadin University for allowing us to complete this work. I would like to take this opportunity to say warm thanks to all my beloved friends, who have been so supportive along the way of doing my thesis. I also would like to express my wholehearted thanks to my family for the generous support they provided me throughout my entire life, particularly through the process of pursuing the thesis. Last but not least, my deepest thanks go to all the people who took part in making this thesis real.

## SUMMERY

The toxicity impact of inhaling a Hookah on level of white blood cells(WBC) of human blood samples has been estimated during blood analysis of ten (10) volunteers smoker, and compered it with five (5) healthy volunteers (none-smokers).

This project was conducted over a period of time of Feb. (2024) in Erbil city centre. Ten (10) samples of male and females were measured as a total of smokers and five (5) non-smokers. Blood samples are analysed by blood analysis machine via CBC test for each cases and control blood samples.

Our results indicated that the smoking of water pip effect on the level of white blood cells (WBC) in smokers compared to non-smokers. Average level of the WBC for cases was  $6368.1 \pm 2120.1$  cells /micro litter of the blood samples, but its average values for the control blood samples was  $8420 \pm 2068.85$  cells per micro litter of the blood. Average level of WBC count for the control samples was more near the median of accepted level ( $\sim 7750$  WBC cells per micro litter) compared with its level of the cases samples due to smoking the water pip , in addition of the variation in live style

**Key word:** Hookah, Smoking, Blood, CBC, RBC.