IJCE, Vol. 1, No. 2, December 2024, pp. 37 – 41

Indonesian Journal of Chemical Education

https://journal.uny.ac.id/index.php/ijce/index

A Questionnaire Study on University Students' Awareness of Forensic Chemistry

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Article Info

Received: Aug 11th, 2024
Revised: Nov 15th, 2024
Accepted: Dec 29th, 2024

Keywords:
forensic chemistry, questionnaire, awareness, students, education

Abstract

This article delves into the growing significance of forensic science within criminal investigations and court proceedings, focusing on the pivotal role of forensic chemistry. Forensic chemistry, a sub-discipline of forensic science, is critical in examining physical evidence, encompassing substances like drugs, explosives, and toxic compounds. However, despite the escalating demand for forensic chemists in the job market, the public's awareness and knowledge of forensic chemistry, including university students, remains inadequately explored. Through a questionnaire study, this article presents the results that elucidate the extent of awareness and knowledge regarding forensic chemistry among university students. Additionally, this research examines the attitudes and perceptions of university students towards forensic chemistry education and career opportunities. The implications derived from the findings of this study are profound and have far-reaching consequences, specifically concerning forensic chemistry education, career development, and the enhancement of public comprehension surrounding forensic science.

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e-ISSN 2581-2645

INTRODUCTION

Forensic science has witnessed a marked increase in its significance within criminal investigations and court proceedings over recent years (Baskin & Sommers, 2011). Within forensic science, forensic chemistry holds a crucial position as a sub-discipline, primarily concerned with examining and analysing physical evidence encompassing various substances such as drugs, explosives, and toxic compounds (Baskin & Sommers, 2011). Despite the growing demand for forensic chemists in the current job market, there exists a dearth of knowledge regarding the awareness and understanding of forensic chemistry among the general public, including university students (Desai, et al, 2017). This article aims to bridge this knowledge gap by presenting the findings of a questionnaire-based study, which explores the level of awareness and knowledge of forensic chemistry among university students. Additionally, this research investigates the attitudes and perceptions of university students towards forensic chemistry education and career opportunities. The outcomes of this study possess significant implications for the development of forensic chemistry education and careers, as well as the facilitation of public comprehension surrounding the domain of forensic science.

Forensic chemistry involves the application of chemical principles and techniques to analyse various types of evidence related to criminal investigations (Baskin & Sommers, 2011). The importance of forensic chemistry in the criminal justice system cannot be overstated (Morgan, 2017). It helps in solving various types of criminal cases, including homicides, drug trafficking, arson, and sexual assaults (Baskin & Sommers, 2011). Forensic chemistry analysis provides the foundation for criminal investigations and is often presented as evidence in courtroom

proceedings (Baskin & Sommers, 2011). Without applying forensic chemistry principles and techniques, many criminal cases would remain unsolved, and the perpetrators would undoubtedly go unpunished (Baskin & Sommers, 2011).

Forensic chemistry is an essential part of forensic science, as it helps identify and analyse evidence crucial for solving crimes (Desai, et al, 2017). Forensic chemists analyse physical evidence such as drugs, fibers, and fingerprints, as well as chemical evidence such as blood, saliva, and urine [4]. They use sophisticated analytical techniques such as chromatography, spectroscopy, and mass spectrometry to identify and quantify the substances present in the evidence (Muehlethaler, et al, 2015).

On the other hand, the job market for forensic chemistry experts is steadily increasing due to the growing demand for their skills (Tebbett & Wielbo, 2007). Forensic chemists can work in various industries, including law enforcement agencies, government agencies, private laboratories, and academic institutions (Adams, 2024). Forensic chemistry experts are in high demand due to the need for their skills in criminal investigations and courtroom proceedings. According to the Bureau of Labor Statistics, the demand for forensic science technicians is projected to increase by 14% from 2019 to 2029 [Elena, 2023).

METHODS

Research Design and Instrumentation

A study was conducted using a questionnaire to evaluate university students' awareness, knowledge, attitudes, and perceptions regarding forensic chemistry. The study sample comprised a diverse group of university students from a specific academic discipline (undergraduate students of the College of Biotechnology). The questionnaire incorporated structured questions designed to measure various aspects of awareness and knowledge related to forensic chemistry and attitudes and perceptions towards forensic chemistry education and career prospects. Data collected from the questionnaires were subjected to rigorous statistical analysis, employing appropriate measures to ascertain the participants' level of awareness, knowledge, attitudes, and perceptions.

Sampling Strategy and Response Rate

The study participants were recruited from a large public university in Iraq. The sampling strategy involved recruiting undergraduate students. The response rate was 62%, with 20 participants completing the questionnaire.

Data Analysis and Interpretation

The data were analysed using descriptive statistics such as frequencies, percentages, and means. Inferential statistics such as Microsoft Excel were used to compare differences in awareness levels across different disciplines and levels of education.

RESULTS AND DISCUSSIONS

The questionnaire was done on a sample of about 20 undergraduate students. It is designed to obtain students' knowledge of Forensics and its relation to other sciences and subjects. First, Figure 1 shows that about 95 % of the students questioned know about the studied subject, and some even have expert knowledge about it.

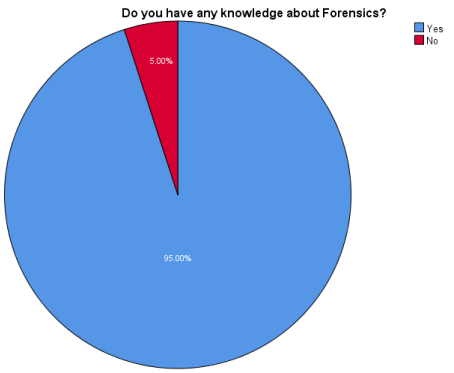

Figure 1. A chart showing the students' percentage of answering the questions "Do you have any knowledge about Forensics?"

Between 85-90 % of those students understand the connection between DNA and Forensics (Figure 2) and DNA and Biotechnology (Figure 3).

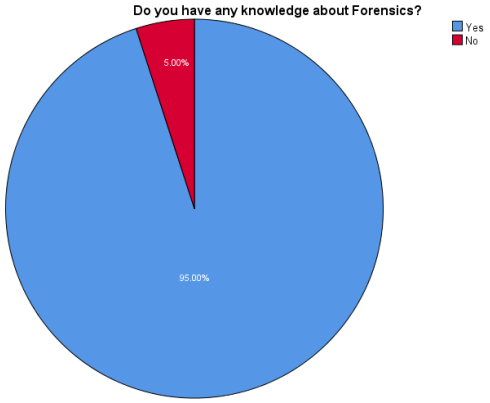

Figure 2. A chart showing the students' percentage of answering the questions "Do you know there is any connection between DNA and forensics?"

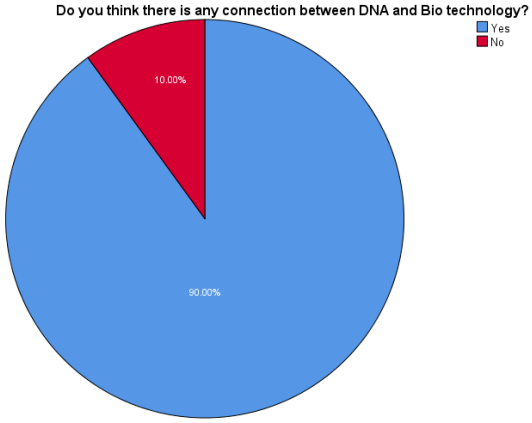

Figure 3. A chart showing the students' percentage of answering the questions "Do you know there is any connection between DNA and biotechnology?"

In addition, Figure 4 clearly shows that about 10 % of the students don't think DNA can be helpful in crime scenes and is used as evidence.

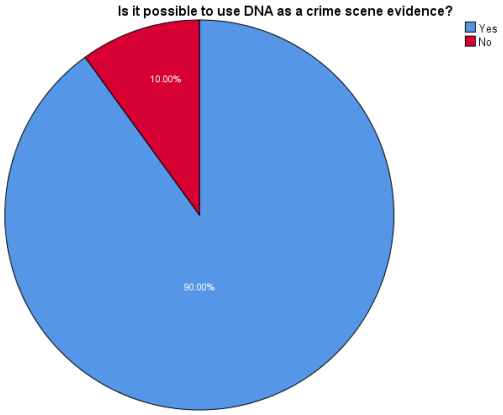

Figure 4. A chart showing the students' percentage of answering the question "Is it possible to use DNA as crime scene evidence?"

The Figure 5 indicates that 85 % of the students are willing to take more courses to study Forensics either during their undergraduate study or even additional courses that can be taken after graduation.

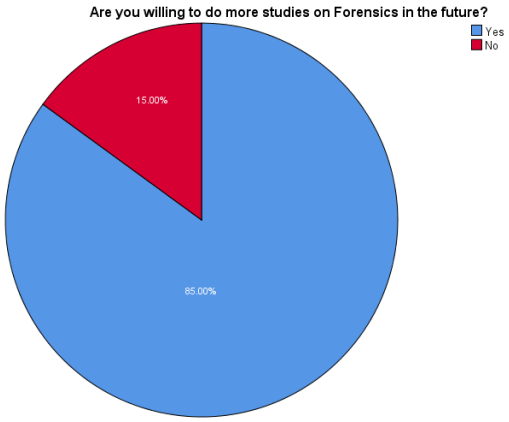

Figure 5: A chart showing the students' percentage of answering the questions "Are you willing to do more studies on Forensics in the future?"

Demographic Characteristics of the Participants

Most participants were female, and 86% were undergraduate students. The participants came from a variety of disciplines of the College of Biotechnology, including two departments: Molecular and Medical Biotechnology and Plant Biotechnology.

Overall Awareness of Forensic Chemistry among University Students

The results showed that university students' overall awareness of forensic chemistry was good, with a mean score of 4.5 out of 5. 85% of participants revealed awareness in the correlation between Forensic science and the science of DNA and Biotechnology. Furthermore, the participants showed a positive attitude towards forensic chemistry education and career opportunities, with the majority indicating that they would be interested in taking a forensic chemistry course and pursuing a career in forensic chemistry.

It is worth noticing that several factors influencing awareness of forensic chemistry were discipline of study, level of education, and exposure to forensic science through media and personal experience.

Limitations of the Study and Future Research Directions

Many university students lack awareness of the field despite the importance of forensic chemistry in criminal investigations and courtroom proceedings. The present study aims to determine the level of understanding of forensic chemistry among university students. However, there are some limitations to the present study. One of the limitations of the present study is the use of a questionnaire to collect data. The questionnaire may not have captured all the relevant information about the students' awareness of forensic chemistry. The number of students was not high, and the survey was conducted in one college and university. Future research should broaden the demographic aspect and use other data collection methods, such as interviews or focus groups, to better understand students' awareness of forensic chemistry. However, the present study's findings suggest a need to increase awareness of forensic chemistry among university students. Forensic chemistry experts can play a significant role in educating university students about the importance of the field and career opportunities. Universities should also consider including forensic chemistry courses in their curriculum to allow students to learn about the field.

CONCLUSION

The present study aimed to determine the level of awareness of forensic chemistry among university students. The findings suggest that many university students lack understanding of the field. It is essential to increase awareness of forensic chemistry among university students to attract more students.

Recommendations for Enhancing Awareness and Interest in Forensic Chemistry among University Students

To enhance awareness and interest in forensic chemistry among university students, universities should consider including forensic chemistry courses in their curriculum. Forensic chemistry experts can also play a significant role in educating university students about the importance of the field and career opportunities. Increasing awareness of forensic chemistry among university students will attract more students to the field and prepare them for criminal justice and forensic careers. In conclusion, this study highlights the need for promoting greater awareness and knowledge of forensic chemistry among university students. By enhancing their understanding of the role of forensic chemistry in criminal investigations and courtroom proceedings, as well as the job opportunities available in this field, students will be better equipped to pursue careers in forensic chemistry. Additionally, this study provides recommendations for enhancing forensic chemistry education and career development, which can have practical implications for the job market and criminal justice system.

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