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An Empirical Research on Forensic Science, Its Importance and Its Effectiveness Regarding Various Crime in the Field of Criminology

Harshini A^a Prajanna. B^b

^aSaveetha School of Law, Chennai, India ^bSaveetha School of Law, Chennai, India

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Forensic medicine is one of the biggest and most significant zones of scientific science and is furthermore called a lawful medication or clinical statute, it applies clinical information to criminal and common law. Medication and law have been connected from the most punctual occasions and the bonds that joined them were religion, strange notions, and wizardry. The objectives of the research are to understand the effects of forensic science in the field of criminology and also to analyze the importance of forensic criminology despite its flaws. The research method used here is descriptive research. A convenient sampling method is used here to collect the data. The total sample size is 253. In the sample frame of research courts, forensic departments and lawyers the independent variables used are age, gender, education qualifications, place of living, salary, occupation, and marital status. The dependent variables are criminalistics forensic intelligence, countering terrorism, effectiveness of forensics in crimes, burglary, murder, rape, aggravated assault, drug crime, related to breath and blood samples, and admissibility of witnesses of forensic scientists as experts' opinion. The statistics/tools used for analysis are graphs. The important findings are that the futuristic cybercrime and digital forensics is the future of forensic science and among various crimes, a specific role is played by forensic science. Thus, forensic science is rooted deep inside criminal law and despite its flaws, it's considered very much essential.

Keywords: *forensic science, criminology, evidence, wrongful convictions, flawed science.*

INTRODUCTION

Forensic medicine is one of the biggest and most significant zones of scientific science and is furthermore called a lawful medication or clinical statute, it applies clinical information to criminal and common law. Zones of medication that are generally associated with criminological medication are life structures, pathology, and psychiatry. Clinical law or scientific medication is the utilization of clinical science to legitimate issues. It is normally engaged with cases concerning blood relationships, psychological sickness, injury, or demise coming about because of brutality. Medication and law have been connected from the most punctual occasions and the bonds that joined them were religion, strange notions, and wizardry. The factors affecting forensic science are misleading testimony, unreliable or invalid forensic discipline, lack of funding, insufficient validations of a Method, at times leading to wrongful convictions, and faults in the laboratory. Critical advances should be made further in the forensics field. Some current trends and techniques that have emerged are DNA phenotyping, Steam thermography, Frontal X-rays, Omni chrome photography, video comparator, 3D printing, etc. Forensic science and its flaws were compared with various other countries such as Argentina, Ancient China, Scotland and India. The research aims to analyze the importance of forensic criminology despite its flaws.

OBJECTIVES

- To understand the effects of forensic science in the field of criminology.
- To analyze the importance of forensic criminology despite its flaws.
- To analyze and interpret the admissibility of witnesses of forensic scientists as expert opinions.
- To interpret the agreed ability towards the criminalistics forensic intelligence being utilized and developed proactively in countering terrorism.
- To know about the effectiveness of forensic science in various crimes such as rape, murder, blood-related crimes, and drug crimes.

REVIEW OF LITERATURE

Sehrawat (2021)¹: It has revealed that Analysis of various case histories reveals that forensic anthropologists have a big role in the recovery and identification of the victims of the various war crimes, genocides, racial conflicts, and violent cruelties committed against humans in fashionable history.

Strode (2020)²: This article explains that an increase in rate and violence is predicted shortly. Forensic experts alongside forensic odontologists are going to be receiving many cases shortly and they should be able to face the challenges. Within the present paper, a critical perspective is presented on COVID-19 and its socioeconomic impact. Recommendations are provided for effectively completing the investigative procedures associated with forensic odontology.

Scheila Manica (2019)³: The purpose of this paper was to explore the lecturers' opinions on educating the situation in the twenty-first century and its modern standing. Even though the number of forensic dentists is no longer low worldwide, no longer all are worried about teaching. A whole of 36 dentists (26 males, 10 females) from 19 international locations answered a survey of eight questions. Results confirmed an excessive prevalence of men (84.6% postgraduate) as antagonistic to one hundred percent of female postgraduates. Forensic 'dental identification', 'overview of forensic dentistry' and 'DVI' have been subjects extensively taught and 'bite mark analysis'.

Jennifer. L. Mnookin (2018)⁴: This paper emphasizes that Forensic science proof is at a crossroads. Over the last two decades, forensic science claims and techniques have been

¹ J S Sehrawat and Deeksha Sankhyan, 'Forensic Anthropology in Investigations of Crimes Against Humanity: Global Dimensions and the Mid-19th-Century Ajnala (India) Massacre' (2021) 33(1) Forensic Science Review 37-65 <https://www.researchgate.net/publication/348973466_Forensic_Anthropology_in_Investigations_of_Crimes_Against_Humanity_Global_Dimensions_and_the_Mid-19th-Century_Ajnala_India_Massacre> accessed 13 March 2024

² Sachin C Sarode *et al.*, 'Perspective on Forensic Odontology and COVID-19' (2020) 21(8) The Journal of Contemporary Dental Practice <<https://doi.org/10.5005/jp-journals-10024-2871>> accessed 13 March 2024

³ Scheila Manica and Ludovica Gorza, 'Forensic Odontology in the 21st Century - Identifying the Opinions of Those behind the Teaching' (2019) 64 Journal of Forensic and Legal Medicine 7-13 <<https://doi.org/10.1016/j.jflm.2019.03.006>> accessed 12 March 2024

⁴ Jennifer Mnookin, 'The Uncertain Future of Forensic Science' (2018) UCLA School of Law, Public Law Research Paper No 18-42/2018 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3300354> accessed 12 March 2024

challenged to a developing refrain of tutorial and scientific criticism. Much of the criticism has targeted the deeply inadequate lookup foundations of many types of many times used pattern identification evidence, inclusive of latent fingerprints, device marks, bullets, chew marks, documents, and signatures.

Boaz Sangero (2018)⁵: This article delivers the best approach to well-being with regards to forensic Safety from Flawed Forensic Sciences Evidence. For analysis, the author took the predominant forensic science evidence tools that are DNA testing and fingerprinting as they involve more in criminology.

Collie (2018)⁶: It has highlighted the daily life situation in the UK, where a suspect's mobile phone is frequently given to a police officer with minimal training to download. The results from the forensic tool used for the extraction, will be handed to someone with even less or, more likely, absolutely nil training in digital forensics.

Bhavana (2016)⁷: In this paper, states that the legal executive framework in India is experiencing different unpredictable issues that have led to surprising postponements in its organization bringing about more than millions of cases to be forthcoming in the Indian Court. The great commitment of Forensic Science is to help the equity conveyance by featuring current realities behind the wrongdoing utilizing logical testing of addressed reports proof in the lawbreaker, common, administrative, just as legal cases. The current investigation makes a genuine endeavor to appreciate and perceive the convenience and effectiveness of the strategies and instruments received and applied to guarantee the steadfastness and consistency of addressed archives as proof in the Court of Law.

⁵ Boaz Sangero, 'Safety from flawed forensic science evidence' (2018) 34(4) Georgia State University Law Review <<https://core.ac.uk/download/pdf/234561565.pdf>> accessed 17 March 2024

⁶ Jan Collie, 'Digital Forensic Evidence-Flaws in the Criminal Justice System' (2018) 289 Forensic Science International 154-155 <<https://pubmed.ncbi.nlm.nih.gov/29864602/>> accessed 12 March 2024

⁷ Desai Bhavana, 'Forensic Examination and the Admissibility of Questioned Documents as Evidence in the Court of Law' (D'Phil Theses, Karnataka University 2016)

Roshni Dugan (2016)⁸: Forensic medicinal drugs are one of the biggest and most necessary areas of forensic science. Also referred to as legal medicine or scientific jurisprudence, it applies scientific know-how to crooks and civil law. Areas of medication that are often worried in forensic medicine are anatomy, pathology, and psychiatry. Medical jurisprudence or forensic remedy is the software of clinical science for criminal problems. It is normally concerned with instances regarding blood relationships, intellectual illness, injury, or dying ensuing from violence.

Gary Edmond (2015)⁹: This article opinions traditional English methods to the admission and contrast of professional evidence. It pursues distinction from felony processes to forensic science proof with the types of standards being promoted with the aid of a variety of scientific organizations. This comparative workout suggests that admissibility jurisprudence and felony exercise may be misguided, especially in their attempts to alter the evaluation or sample matching disciplines. The article recommended that courts have privileged the incorrect sorts of heuristics in their attempts to interact with scientific and technical types of knowledge. More disturbingly, it questions whether or not traditional admissibility standards, even in conjunction with trial safeguards, supply jurors and judges with the sorts of statistics required to rationally determine lots of the incriminating specialist opinion proof mechanically introduced in crook proceedings.

Paul (2013): This paper aimed at reducing the cultural stereotypes of science and law. Effective partnerships among advocates and forensic criminologists are irreplaceable for coordinating logical proof into criminal procedures and should be reevaluated between singular professionals on an ongoing premise. Productive interdisciplinary joint efforts between researchers with a common interest in legal science ought to get rid of reductive social generalizations of Science and Law.

⁸ Roshni Duhan, 'FORENSIC MEDICINE AND INDIAN CRIMINAL LAWS - A STUDY OF RELEVANCY WITH LEGAL PROVISIONS' (2016) 4(2) Innovare Journal of Medical Sciences 1-5

<<https://journals.innovareacademics.in/index.php/ijms/article/view/7179>> accessed 17 March 2024

⁹ Gary Edmond, 'Legal versus non-legal approaches to forensic science evidence' (2015) 20(1) The International Journal of Evidence and Proof <<https://doi.org/10.1177/1365712715613470>> accessed 17 March 2024

Tim J. Wilson (2013):¹⁰ This paper explains the importance of the normative, epistemic and expert aspirations of crook justice practitioners for making sure the cost of forensic science to crook justice. We argue that the dangers threatening scientific evidence, especially recurrent issues of under-funding and unequal admission to the defense, may additionally be masked by using older narratives of neoliberalism or too slim an institutional focus, deal greater complicated way than before regarded in the extant literature.

Douglas. H. Ubelaker (2012)¹¹: This article discusses the key issues, future directions related to forensic science and its contemporary practices on criminalistics. It also deals with global thinking, methodologies in evidence and its research and digital evolution.

Victor Room (2012)¹²: This paper deals with various questions that are examined by means of analyzing the bodies positioned at the intersection of science and law. More specifically, the transformation of 'private bodies' into 'public bodies' is analyzed by way of going into the vital factors of forensic DNA profiling in the Dutch jurisdiction. It can be argued that pretty much a range of 'forensic genetic practices' enact particular forensic genetic bodies. These enacted forensic genetic bodies are associated with a wide variety of infringements of civil rights, which develop to be articulated in exploring these forensic genetic bodies' 'normative registers'.

Jon T. Mandracchia (2013):¹³ In this study, examined the consequences of schooling on attitudes towards quite a few crook justice problems in university college students enrolled in a senior-level forensic psychology path in contrast to a non-psycho-legal psychology course. Results indicated that training about public coverage problems influenced students' attitudes towards the death penalty, jail reform, and the madness defense. In addition, it examined preexisting variations in these attitudes primarily based on demographic and different reputation variables

¹⁰ Tim Wilson and Angela Gallop, 'Criminal Justice, Science and the Marketplace: The Closure of the Forensic Science Service in Perspective' (2013) 77(1) *The Journal of Criminal Law* <<https://doi.org/10.1350/jcla.2013.77.1.818>> accessed 17 March 2024

¹¹ Douglas H. Ubelaker, *Forensic Science: Current Issue, Future Directions* (Wiley Blackwell 2012)

¹² Victor Toom, 'Bodies of Science and law: Forensic DNA profiling, Biological Bodies and Biopower' (2021) 39(1) *Journal of Law and Society* <<https://doi.org/10.1111/j.1467-6478.2012.00575.x>> accessed 17 March 2024

¹³ Jon T. Mandracchia et al., 'What's with the Attitude? Changing Attitudes About Criminal Justice Issues' (2013) 40(1) *Criminal Justice and Behavior* 95–113 <<https://doi.org/10.1177/0093854812459474>> accessed 17 March 2024

(i.e., race, gender, tutorial classification standing) and observed that these variables have been related to variations in attitudes about crook justice problems in a great way.

Joseph Peterson (2010):¹⁴ This paper elaborates on the Role and Impact of Forensic Evidence in the Criminal Justice Process. It aims to describe and catalog the kinds of forensic evidence collected at crime scenes and track the use and attrition of forensic evidence in the criminal justice system from crime scenes using laboratory analysis, and then subsequent criminal justice processes.

Kent Roach (2009):¹⁵ This paper gives a quintessential evaluation of the National Research Council's (NRC) 2009 record in the form of comparative trips in Australia, Canada, and the United Kingdom. It suggests that the NRC's proposals for federal legislation of the forensic sciences are greater for a unitary kingdom than a federal system.

Jessica (2008):¹⁶ This article gives a response to that question in three sections. In the first place, this article takes a gander at the powerlessness of specific fields of legal science to create solid outcomes. Second, it talks about issues with the current strategies for testing feelings dependent on untrustworthy science. At long last, it proposes another structure to all the more likely empower detainees to look for an audit of such feelings. The ability of measurable proof and inward issues in criminological research facilities should be tended to shield blameless respondents from being sentenced on the primary occasion.

Mike Redwayne and Mc. Cartney (2008):¹⁷ This article. gives an account of the improvement of forensic identification applied sciences and how this has impacted the criminal system. It traces the introduction of forensic identification technologies, focusing on fingerprinting and forensic DNA typing, and their developing deployment inside the crook justice system. It additionally

¹⁴ Joseph L. Peterson D.Crim. et al., 'Role and Impact of Forensic Evidence in the Criminal Justice Process' (2010) 58(1) Journal of Forensic Sciences <<https://doi.org/10.1111/1556-4029.12020>> accessed 17 March 2024

¹⁵ Kent Roach, 'FORENSIC SCIENCE AND MISCARRIAGES OF JUSTICE: SOME LESSONS FROM COMPARATIVE EXPERIENCE' (2009) 50(1) Jurimetrics <<http://www.jstor.org/stable/41550027>> accessed 17 March 2024

¹⁶ Jessica D. Gable and Margaret D. Wilkinson, 'Good Science Gone Bad: How the Criminal Justice System Can Redress the Impact of Flawed Forensics' (2008) 59(5) Hastings Law Journal <https://repository.uclawsf.edu/hastings_law_journal/vol59/iss5/2> accessed 17 March 2024

¹⁷ Carole McCartney, *Forensic Identification and Criminal Justice: Forensic Science, Justice and Risk* (Willan Publishing 2006)

elucidates the approaches in which these new applied sciences are accelerating procedural adjustments to investigative practices and suggests the methods in which in some areas human rights (such as privateness rights and rights in opposition to discrimination) are coming under threat. The use of forensic proof in crook investigations and trials is analyzed in detail.

Jones (2003):¹⁸ This article presents an audit and assessment of the utilization and maltreatment of journal sway factors for deciding the significance and notoriety of logical journals in the field of forensic science and toxicology. The use of effect factors for assessing the distributed work of individual researchers is additionally talked about. It was tracked down that the effect factor mirrors the reference pace of the normal article in a journal and not a particular article. Numerous boundaries impact the reference pace of a specific journal's articles and, hence, its effect factor.

A.S. Curry (1969): This paper deals with the death of the police, how the forensic science service provided the need, the detection of crime, the collection of resources such as alcohol, drugs, etc. and all the dramatic impacts it had on the magistrates.

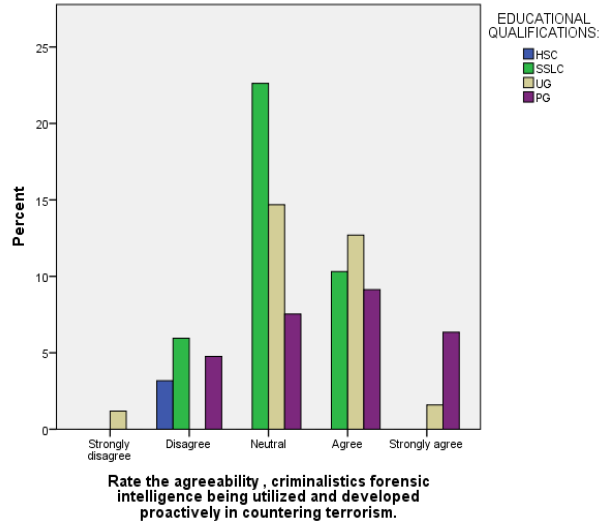
METHODOLOGY

The research method used here is empirical research. A convenient sampling method is used here to collect the data. The total sample size is 253. The sample frame of research courts, forensic departments and lawyers. The independent variables used are age, gender, education qualifications, place of living, salary, occupation, and marital status. The dependent variables are criminalistics forensic intelligence, countering terrorism, the effectiveness of forensics in crimes, burglary, murder, rape, aggravated assault, and drug crimes, related to breathing and blood samples, and the admissibility of witnesses of forensic scientists as expert opinion. The statistics/tools used for analysis are graphs.

¹⁸ A WJones, 'Impact Factors of Forensic Science and Toxicology Journals: What Do the Numbers Really Mean?' (2003) 133(1-2) Forensic Science International
<[https://doi.org/10.1016/s0379-0738\(03\)00042-2](https://doi.org/10.1016/s0379-0738(03)00042-2)> accessed 17 March 2024

ANALYSIS AND INTERPRETATION

FIGURE 1:

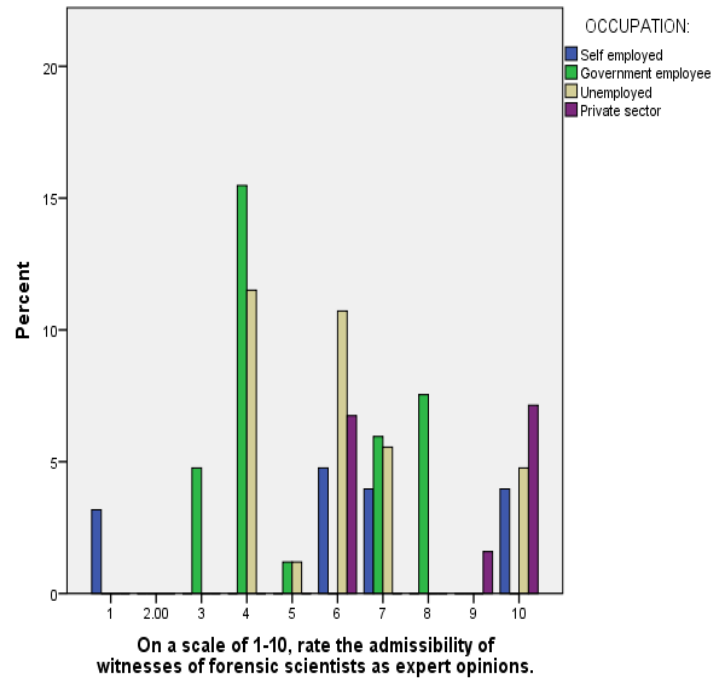


LEGEND: Shows the opinion of respondents on criminalistics forensic intelligence being utilized and developed proactively in countering terrorism concerning educational qualifications.

RESULTS: Respondents as the educational qualifications rise agreeability increases.

DISCUSSION: Respondents as the educational qualifications rise, agreeability increases, this thinking about the instances and durations that have been used in the find out of criminology, and forensic science is a new precept ingrained inside the crook justice system. It is evident in the learning about cutting-edge criminology that dates to the nineteenth and twentieth centuries.

FIGURE 2:

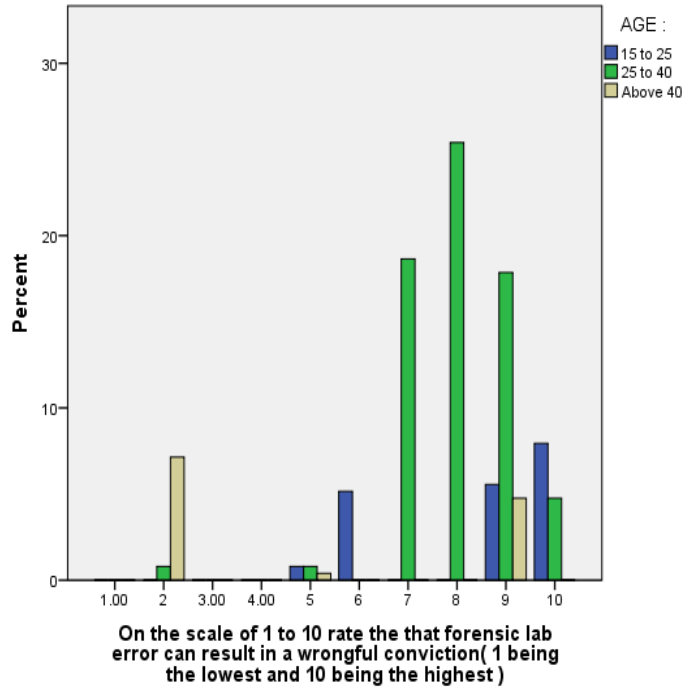


LEGEND: Shows the comparison between occupation and the respondent's opinion on the admissibility of witnesses of forensic scientists as expert opinions.

RESULTS: The government employees and unemployment rate are lower on the scale.

DISCUSSION: It might be because they feel that being government servants that sector is prone to corruption, so they are almost against the admissibility of witnesses of forensic scientists as expert opinions. Forensic scientists are 'Expert' witnesses as antagonistic to regular or truthful witnesses. Expert witnesses are accepted to testify now not simply about what the consequences of checking out or evaluation had been ('Facts'), but additionally to provide an opinion about what these consequences suggest.

FIGURE 3:

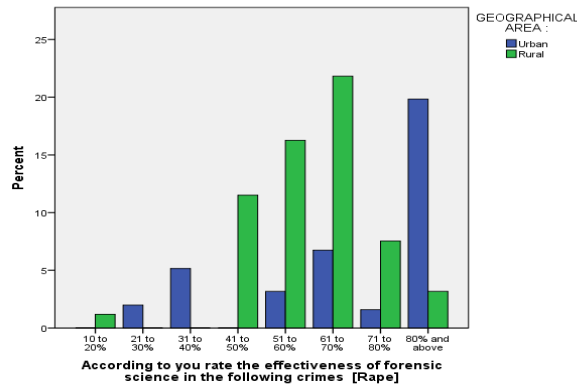


LEGEND: Depicts the age distribution and their opinion on forensic lab errors that can result in a wrongful conviction.

RESULTS: It is clear that respondents aged 25 to 40 supported that forensic lab error can result in a wrongful conviction.

DISCUSSION: It is clear that respondents of age 25 to 40 supported that forensic lab error can result in a wrongful conviction, this is the age they get exposed to the real society and they feel errors can happen and they feel it's the main reason for wrongful convictions. The major causes of wrongful convictions include faulty witness identification of suspects, perjury by those reporting crimes or testifying on the witness stand, false pleas and confessions, and police and prosecutorial misconduct.

FIGURE 4:

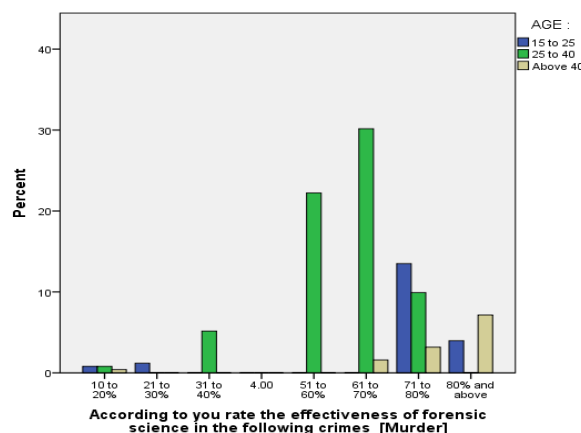


LEGEND: Shows the respondent’s opinion on the effectiveness of forensic science towards rape concerning the Geographical area of living.

RESULTS: It is clear that respondents of the rural population agree above average to the effectiveness of forensic science towards rape concerning Geographical area of living.

DISCUSSION: It is clear that respondents from the rural population agree above average on the effectiveness of forensic science, it might be because the number of Rape cases in rural is comparatively more than that in urban and so the investigation is done and aware there. Attainable forensic scientific methods (including DNA testing) are outlined and the sexual assault literature examines the significance of bodily and forensic proof in resolving such instances.

FIGURE 5:

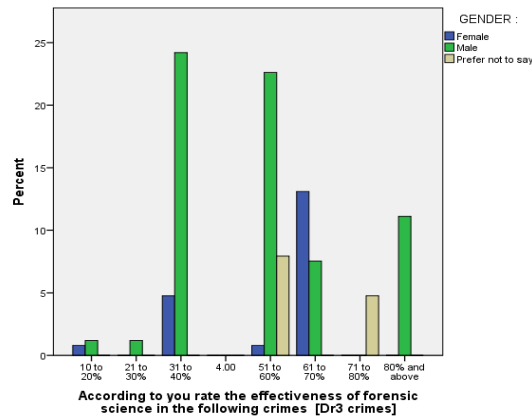


LEGEND: Shows the respondent's opinion on the effectiveness of forensic science towards Murder concerning the respondents' age.

RESULTS: It is clear that respondents of the age group 25 to 40, agree above average on the effectiveness of forensic science towards murder.

DISCUSSION: It is clear that respondents of the age group 25 to 40, agree above average on the effectiveness of forensic science towards murder, according to various statistics this is the age that they are both victims and criminals of murder. So, they have exposure and hence opted above average but it's to be noted that it still needs serious improvement.

FIGURE 6:

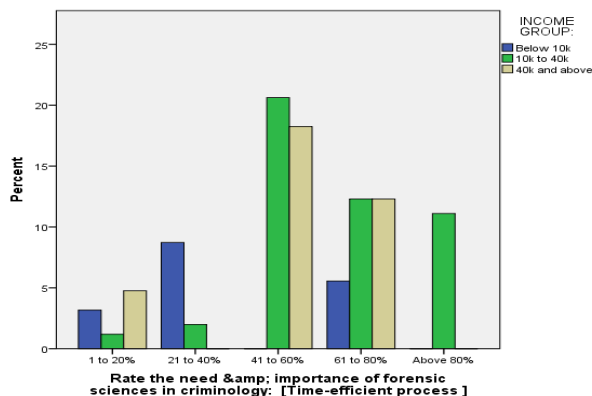


LEGEND: Shows the respondent's opinion on the effectiveness of forensic science towards drug crimes concerning Gender.

RESULTS: It is clear that most of the male respondents feel that the effectiveness is low.

DISCUSSION: It is clear that most of the male respondents feel that the effectiveness is low, this might be because drug crimes are still more predominant among males when compared to females and there are numerous cases where they have been caught. Men are greater possibly to grow to be addicts. Men are extra in all likelihood to abuse elements due to peer strain or to be a section of a group. Forensic scientists analyze those samples to identify the nature and characteristics of those drugs.

FIGURE 7:

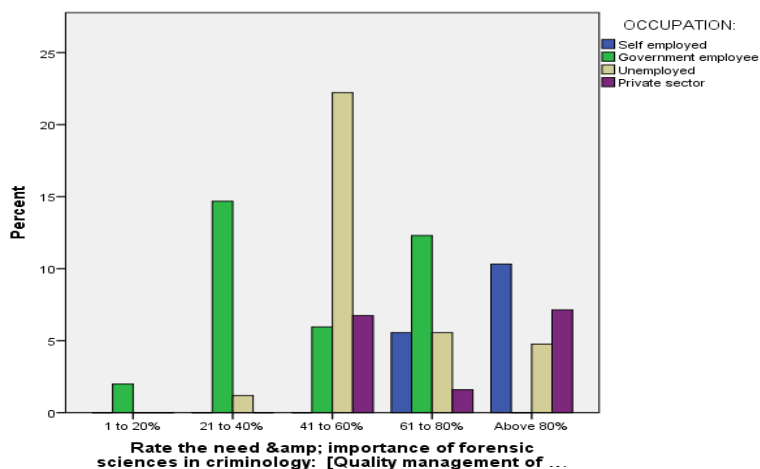


LEGEND: Fig 7. Depicts the respondents’ opinion on the efficient process as one of the important aspects of forensic science in criminology concerning the income group.

RESULTS: It is clear that respondents of the income 10k to 40k mostly opt 41 to 60%.

DISCUSSION: It is clear that respondents with an income of 10k to 40k mostly opt for 41 to 60%, this might be because they cannot afford to spend more time and money more time in a suit.

FIGURE 8:

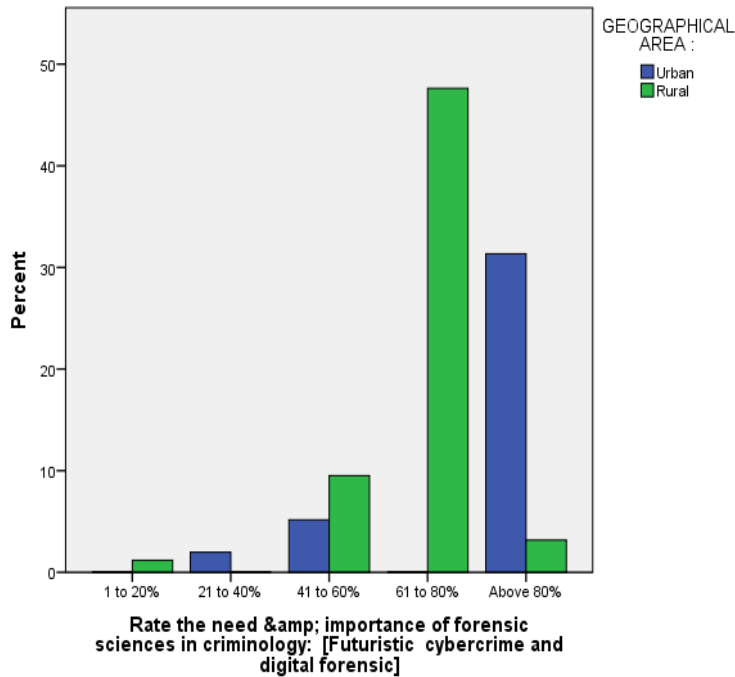


LEGEND: Shows the respondent's opinion towards the quality management of crimes as the importance of forensic science concerning Occupation.

RESULTS: It is clear that self-employed respondents mostly opted for above 80%.

DISCUSSION: It is clear that self-employed respondents mostly opted for above 80%, this might be because all the self-employed know the value of management and how essential it is to criminology.

FIGURE 9:



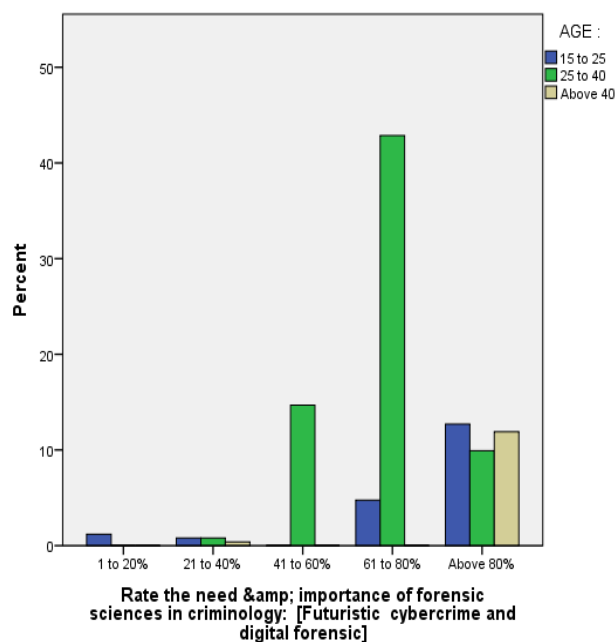
LEGEND: Shows the respondents' opinion towards futuristic cybercrime and digital forensics as the importance of forensic science concerning the Geographical area.

RESULTS: It is clear that respondents from rural areas have opted mostly for futuristic cybercrime and digital forensics as the importance of forensic science.

DISCUSSION: It is clear that respondents from rural areas have opted mostly for futuristic cybercrime and digital forensics as the importance of forensic science they consider very much needed and important because compared to cities digital world has just started to develop in rural areas, with more the development more the threat. Cyber Forensics includes the evaluation of proof located in computer systems and digital storage media like pen drives, difficult disks etc. Its foremost goal is identifying, preserving, recovering, analyzing, and offering data and

opinions about digital information. Although it is mainly used for the investigation of cybercrimes, it additionally is extensively used in civil proceedings.

FIGURE 10:

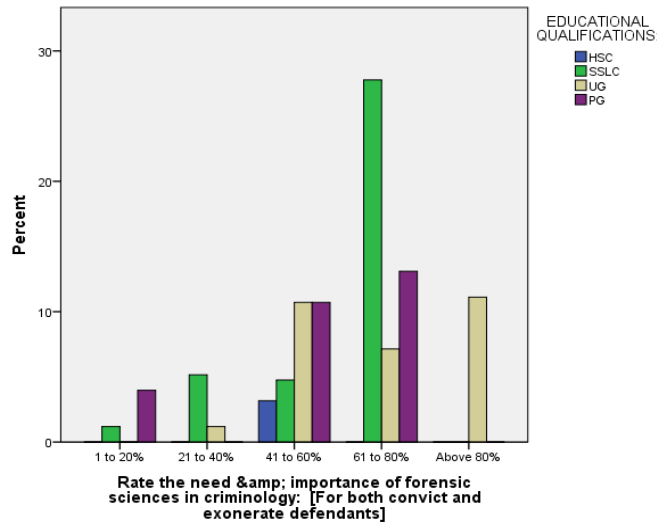


LEGEND: Depicts the respondents’ opinion towards futuristic cybercrime and digital forensics as the need for forensic science concerning their Age.

RESULTS: It's clear that respondents of the age group 25 to 40 have opted mostly for futuristic cybercrime and digital forensics as the importance of forensic science.

DISCUSSION: It's clear that respondents of the age group 25 to 40 have opted mostly for futuristic cybercrime and digital forensics as the importance of forensic science, this might be because digital threats begin with Adolescents till old and even children are affected. As Parents of age 25 to 40 it's their respondents to safeguard for which digital forensics is considered essential.

FIGURE 11:



LEGEND: This shows the respondent's opinion that for both convicted and exonerated defendants, forensic science is needed and very important.

RESULTS: It is clear that irrespective of their educational qualifications, the respondents opted mostly for 61 to 80%.

DISCUSSION: It is clear that irrespective of their educational qualifications, the respondents opted mostly for 61 to 80%, it might be because though educational qualifications vary their understanding of wrongful conviction was similar so to prevent forensic science is considered important.

SUGGESTIONS

- Legitimate guidelines should be set that block sentencing based on any single piece of proof. The reasoning for this standard is that blunders emerge in each logical test and that the chance of a mistake, which isn't unimportant, forestalls accomplishing verification of blame past a sensible uncertainty when dependent on a solitary piece of proof.
- Increased funding to establish forensic research laboratories and good-quality instruments.

- Strengthening fundamental science and judicial training.

LIMITATIONS

The major limitation of my study is the sample frame. The sample frames such as online surveys didn't help in the interactive collection of responses. The majority of respondents were connected through different social platforms and contacts. There were very few audiences who were unaware of the forensic science department. The restrictive area of sample size is also another drawback. The physical factors are the most impactful and a major drawback to the research.

CONCLUSION

Forensic science is also known as criminalistics. General myth is used not only in criminal cases but also in civil cases. The major objective is to analyze how far forensic science is important in the field of law despite its flaws. Legitimate guidelines should be set that block sentencing based on any single piece of proof. The reasoning for this standard is that blunders emerge in each logical test and that the chance of a mistake, which isn't unimportant, forestalls accomplishing verification of blame past a sensible uncertainty when dependent on a solitary piece of proof. Or maybe, there is a need to return to and check them after they have been executed and to confirm whether everyone accomplishes evenhanded, all in an endeavor for ceaseless improvement, similar to the acknowledged practice in current security. Increased funding, developing rigorous national standards, strengthening fundamental science, and judicial training are the possible suggestions made. The future scope is all about cybercrime and digital forensics as the technology evolves gradually. Hence, for the matter of fairness and justice, forensic science is essential. Thus, forensic science is rooted deep inside criminal law and despite its flaws, it's considered very much essential.