CHALLENGES IN THE USE OF FORENSIC SCIENCE BY THE POLICE FOR CRIME PREVENTION AND CONTROL IN NIGERIA

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Abstract
This paper examines the challenges facing the police in the use of forensic science in crime prevention and control in Nigeria. The problem of unabated criminal behaviour has been worrisome for the safety of lives and property in the country. Constitutionally, the police have the responsibility of maintaining law and order, fighting crime, protecting lives and property, and employing forensic science in criminal investigations; yet, the crime rate continues to escalate daily. The paper discusses the types and significance of forensic evidence, as well as the challenges of criminal justice in forensic investigations. The objective of this study is to ascertain the challenges confronting the utilization of forensic science by the police within Nigeria's criminal justice system and to explore ways of employing it to curtail the high rate of crime in the country. The theoretical framework of this discourse is the Deterrence Theory of Crime Prevention. This paper relies on secondary sources such as national and international journals, books, and related materials. The study reveals that the challenges facing the police include the poor standard of legal education in Nigeria, as well as inadequate forensic skills and equipment, which negatively affect forensic investigations and the operational capacity of the police and other security agencies. There is no doubt that the use of forensic science in criminal investigation and the justice system provides valuable information that cannot be obtained through other conventional methods of investigation. It also assists in determining the innocence or guilt of suspects amidst complex criminal circumstances. This paper recommends that forensic investigators acquire adequate training and skills to enhance their professional competence, identify suspects more effectively, and reduce the incidence of violent crimes and murder in Nigeria.
Keywords: challenges, crime prevention, crime control, forensic science, police

Introduction

More than thirty years have passed since the Nigerian Police adopted the use of forensic science in criminal investigations; however, there are still significant concerns regarding the type of forensic science that the police are using (Etin-osa & Etinosa, 2019; Otu & Elechi, 2018; Aigbokhaevbo & Iyamu-Ojo, 2015; Nte, 2012). The Nigerian Police's inability to look into and solve numerous crimes that individuals thought could have been resolved with the application of forensic technology was the source of the concerns. Authorities still do not emphasize forensic science, which exacerbates people's fears about its use (Etin-osa & Etinosa, 2019; Otu & Elechi, 2018). Therefore, topics pertaining to the forensic criminal investigation as employed by the NP need to be objectively investigated. Due to the fact that evidence-based policing is essential to guaranteeing an efficient police force, the investigation is especially significant. The popular policing theory known as "evidence-based policing" holds that police tactics should be determined by scientific data gathered from studies on what best enhances officers' capacity to carry out their tasks.

According to Osugba and Agbeyi (2019), the Nigerian police force is tasked with fighting crime and enforcing existing laws and others in cooperation with sister agencies, such as the courts and the correctional systems, in accordance with the Nigerian state's constitutional provisions. The criminal judicial system is the general term used to describe these organizations. According to Kpae and Adishi (2007), who cited the Police Act of 1964, the Nigerian Police Force's duties and responsibilities include preventing and detecting crime, apprehending criminals, maintaining law and order, and protecting people and property. The proper implementation of all laws and rules that they are directly responsible for, and they will carry out any military tasks both inside and outside of Nigeria that may be mandated by this or any other act (Police Act, Cap 336 1964). Similarly, the Nigerian criminal justice system's constitution permits the police and the court to use forensic science, and the police are the first to do so (Oluka et al, 2020). Since forensic science aids in the investigation of nearly all types of crimes,

natural disasters, and suspected criminal conduct, it has been included in national security and law enforcement (Prahlow, 2010). Police and forensic authorities, also referred to as the criminal investigation department and forensic experts, search and inspect the crime scene. Crime investigations are carried out to determine the truth of the act, which is generally referred to as a crime, and to identify the perpetrator by obtaining enough evidence that could persuade the court to guarantee a conviction. Police conduct investigations in an effort to determine the dimensions of the crime scene while taking the required safety and precautionary measures to ensure that no evidence is tampered with. Since the evidence discovered at a crime scene is the only way to persuade the court of the crime and its perpetrator, the first phase of an investigation at a crime scene must be conducted with extreme caution (Verma, Parvez & Ashutosh, 2022). Additionally, forensic science findings or criminal testimony have significance or influence when an accused individual or innocent parties are exonerated in court (Oluka et al, 2020). Lambrechts (2002) reinforced this idea by proposing that forensic investigators should augment their evidence with verified knowledge of the scientific facts of a crime in order to ensure the fairness and admissibility of the facts of a crime in a court of law. Additionally, he maintained that the appropriateness of forensic evidence is frequently correlated with its efficacy. Therefore, investigators must use objective facts generated by investigating agents to establish a crime before any court of law.

Few African nations have low crime rates, making crime one of the most difficult security issues facing nations worldwide (Sarki, 2020). For instance, it is high and rising in Nigeria (National Bureau of Statistics, 2017). Nigeria's socio-economic development and overall security are adversely affected by several common crimes, including financial and economic crimes, cybercrimes, terrorism, rape, murder, assault, drug and substance abuse, theft, kidnapping, and highway robbery (National Bureau of Statistics, 2017). For example, cybercrimes diminish an organization's competitive edge and damage the nation's reputation (Sarki, 2020). Over time, experts have connected the lack of forensic evidence to the numerous unsolved murder cases in Nigeria's criminal justice system (Ngboawaji, 2012). Justice in the nation has become bizarre as a result of these forensic gaps. Every time a murder occurs, Nigerians are informed that the Inspector General of Police has been instructed by the President and Commander-in-Chief of the armed forces to find the murderers. However, evidence indicates that the probe would provide no significant findings; therefore, such a remark is meaningless to Nigerians (Oladele, 2006). Many things must be done quickly in a society where politics, crime, and unsolved politically motivated assassinations have abruptly become a dark reality of our political system and have lowered the level of security and public safety. Therefore, to ensure public safety, the scenario necessitates a comprehensive overhaul of Nigeria's criminal investigation paradigm.

Regretfully, the Nigerian Police Force still heavily relies on eyewitnesses and torture as conventional methods of crime investigation in these days of sophisticated forensic crime investigation procedures. The Nigerian Police (NP) seem to underuse forensic science tools in criminal investigations, despite the high number of crimes that impact socioeconomic development and individual safety in Nigeria (Sarki, 2020). Forensic science offers a superior alternative to identifying, catching, and punishing criminals in a society where crime is on the rise, crimes are no longer committed conventionally, and criminals have become more skilled in their methods.

Statement of the Problem

The Nigerian Police's incapacity to effectively use forensic sciences to investigate crimes is currently its biggest problem. Although the Nigerian Police are working to reduce crime and reestablish public confidence, poor investigative techniques can have serious repercussions, including the conviction and imprisonment of innocent people. A lack of forensic investigative skills has frequently resulted in the incorrect persons being investigated because of faulty evidence collection, fake confessions or admissions, incompetent snitches, and false informants. Given that Nigeria is a multilingual, multiethnic, and multicultural country, the police encounter numerous difficulties. They contend with being underpaid and underequipped on all levels, in addition to the fact that some are dishonest in their application of laws created by dishonest legislators.

There are just four government-owned forensic labs in the entire nation, which has a population of 190,886,311 (National Population Commission, 2018), a high crime rate, and rising rates of criminal activity. Due to its antiquated and insufficient facilities, the one in Lagos, which was founded in 1986, is rarely used.

Literature Review: Conceptual Issues Forensic Science

Watson (2018) defines forensic science as a field of study that uses scientific research to support the legal system in establishing the facts of a crime. He believed that evidence from the crime scene should be analyzed and interpreted by forensic specialists. Blood, saliva, fibers, tire tracks, narcotics, alcohol, paint chips, and weapon residue are some examples of this type of evidence. According to Forest (1983), as referenced in Husan (2022), forensic science is the study of identifying, individualizing, evaluating, and recognizing physical evidence in matters of legal importance using scientific methods. According to Sarki (2020), forensic science, often referred to as forensics, is the systematic study, handling, and interpretation of tangible evidence from a scientific perspective, while considering legal criteria. House of Lords (2019) asserts that in criminal investigations and court procedures, forensic science uses scientific methods to recover, analyze, and interpret pertinent materials and data. It also serves as an intelligence and evidentiary tool to help deliver justice. According to Cole (2014) document examination, toxicology, pathology, drug analysis, print analysis, impression evidence, hair, fibers, paint, glass, soil, entomology, arson and explosives, gunshot residue, materials analysis, "jigsaw" physical fit matching, ballistics, blood spatter, crime scene reconstruction, computer forensics, serology, and DNA profiling are all examples of techniques that fall under the broad definition of forensic science. It is important to remember that forensics spans many different fields. Computer forensics, forensic environmental evidence, forensic anthropology, forensic facial evidence, forensic linguistics, forensic palynology, forensic accounting, forensic document examination, forensic economics, and forensic engineering are just a few of the subfields of forensic science that have been established for this reason (NOUN, 2012; Delemont, Lock, & Ribaux, 2014). Despite its multidisciplinary character, the goal of forensic investigation is to gather facts that may be used as evidence in court so that the accused's involvement in the crime can be established and the crime can be resolved (Lambrechts, as cited in Nte, 2012). Forensic science, then, is the application of science to law in its widest sense. According to Kennedy (2006), a forensic scientist is essentially someone who uses a body of knowledge that has been methodically gathered to supply pertinent information to legal courts that are entrusted with resolving legal disputes.

Types of Forensic Evidence

There are two categories of forensic evidence: biological and physical. Nonliving items like fingerprints, fibers, glass, medications, and bullets are examples of physical evidence. On the other hand, organic materials, including blood, saliva, urine, sperm, and hair, are examples of biological evidence.

Fingerprint Evidence

Olaniyi (2022) asserts that fingerprint formation started early in fetal development. It is impacted by environmental factors and genetics, including exposure to Thalidomide and Rubella. The use of anthropometric measurements for criminal identification came to an end when it was discovered that fingerprints were unique. Developing latent prints discovered at the crime scene and comparing them to known suspect fingerprints, if any, is the focus of fingerprinting. For criminal investigations, this science is essential. According to research, even when it comes to identical twins, its distinctiveness makes it the most widely used type of evidence in the world (Sapse, 2013).

Additionally, studies have demonstrated that fingerprints cannot change over the course of a person's life, except for extremely rare circumstances (Olaniyi, 2022). Loops, arches, and whorls are intricate patterns of friction ridges that make up fingerprints. It is impossible to overstate the value of forensic fingerprinting, particularly in criminal trials in the twenty-first century. For improved identification and legal proceedings, fingerprints must be properly collected, preserved, and examined (Mnookin, Philip, Kellman, Itiel, Gennady, Patrick, Tandra, Everett, & Dave, 2016). This approach appears to be more effective for the police command. Nonetheless, the police continue to use the outdated technique of powder dusting.

Hair and Fibers

Hair and fibers may unintentionally be transferred when the victim and the offender come into direct physical contact, which is necessary for many crimes. Forensic specialists frequently examine hair as tangible evidence in criminal cases. If a suspect's hair is discovered at the crime scene, it can be used to identify them because each individual has a unique hair pattern. Hair can be a trustworthy source to demonstrate the presence of the offender because it contains DNA strands that cannot be replicated or faked (Kinsley, 2015). If hair is properly collected

and brought to the science lab along with a sufficient number of standard samples, it can be used as corroborating evidence to identify a suspect at a crime scene. Hairs found on a victim typically indicate a suspect, and the criminal can be identified by DNA analysis (Husan, 2022). Similarly, fibers discovered on a victim's clothing or in the vicinity of the crime scene may help police identify a specific suspect if he was dressed in a certain brand of coat, sweater, shirt, etc.

Computer and Digital Forensics

The phrase "each betrayal begins with trust" is used in criminology jargon. Your computer and other digital gadgets that you have placed your trust in may also be the first to be betrayed. Every time you log in to this device, you leave a trail of binary numbers—0s and 1s—or a residual representation of data, according to Frempong and Hiran (2014). When employing technology to conduct crimes, the majority of offenders are unable to hide their footprints. They don't understand that even after being erased, computer files and data stay on their hard drives, enabling investigators to follow their illegal activities. The original file can still be restored; file deletion only changes the file's name and conceals it from the user (Frempong & Hiran, 2014). In order to gather and examine data from computer systems, networks, wireless communications, and storage devices in a form that may be used as evidence in a court of law, computer forensics integrates aspects of computer science and law. It is multidisciplinary and incorporates concepts and resources from information technology, network engineering, computer science, computer engineering, telecommunications, law, and ethics. It can look for, find, and evaluate possible information or evidence that is crucial to the upholding of the law in order to assist in both criminal and civil prosecutions. As computer forensics has developed further, it has become increasingly valuable in the fight against crime in the twenty-first century. Therefore, an investigator needs to be aware of these trends. Some of the organizations have ICT-related facilities and staff. ICT concepts, however, are distinct from those of computer or digital forensics. In this way, the EFCC appears to have strong resources, followed by the police and the Civil Defense Corps, in that order.

Forensic DNA Analysis

This entails using a person's unique DNA to address forensic inquiries like maternity and paternity tests and locating a suspect at a crime scene, such as in a physical assault, rape, or murder inquiry (Osugba & Agbeyi, 2019). Genetic information is found in DNA, which is regarded as one of the most reliable kinds of evidence. The gathered skin, hair, and blood cells contain DNA evidence. Additionally, it can be used to solve crimes that took place before the development of DNA analysis technology. DNA is a useful tool in investigations, as no two people, aside from identical twins, have the same DNA. DNA evidence discovered at a crime scene can be used to identify or connect a suspect to the crime (Understanding DNA Evidence: A Guide for Victim Service Providers). Moreover, the first stage of every forensic DNA investigation is DNA extraction. For a successful outcome, one nanogram of DNA is usually sufficient (Norrgard, n.d.). Samples from a crime scene, for example, might match the suspect's DNA. Furthermore, it might demonstrate that the suspect was at the scene of the crime, but it doesn't prove that the suspect actually committed the crime. DNA evidence is frequently not the only piece of evidence used in a prosecution's case. DNA evidence is most useful when paired with other kinds of evidence, including footprints, fingerprints, a detailed examination of the crime scene, and eyewitness accounts. Additional physical evidence that can be gathered from cells includes microbiological data and blood splash patterns (Husan, 2022).

Autopsies

An internal examination includes opening the head, removing and dissecting all thoracoabdominal and neck organs, examining the brain, and preserving a variety of materials for use in any designated follow-up investigations. An autopsy or postmortem examination is an external inspection of the entire body. The deceased person is being examined surgically (Husan, 2022). Menezes and Monteiro (2023) define a forensic autopsy as a postmortem investigation carried out to meet medicolegal goals. Another name for a forensic autopsy is a medicolegal autopsy. The concerned legal authority in charge of the medicolegal investigation of sudden, unexpected, suspicious, mysterious, unwitnessed, obscure, unexplained, or litigious deaths, as well as criminal, industrial, and deaths related to medical or surgical treatment where medical negligence is alleged or anesthetic deaths, gives instructions for performing a forensic autopsy. A legal inquiry, which involves an autopsy as part of the evidence-gathering procedure, is required for all unnatural (homicide, suicide, accident) deaths, suspicious deaths, and unexpected deaths. Given the fact that legal standards vary greatly around the world, the coroner,

medical examiner, magistrate, police, or procurator fiscal may be the legal authority ordering the autopsy surgeon or forensic pathologist to do the forensic autopsy. According to Menezes and Monteiro (2023), the primary goals of an autopsy are to identify the deceased, ascertain the cause of death, help verify or disprove the claimed method of death, if feasible, and calculate the postmortem interval, or amount of time since death.

Forensic Document Analysis

This type of study, also known as a questioned document examination, uses a range of scientific procedures and techniques to provide answers to queries regarding a contested document. Comparing the questioned document or parts of it with a set of established standards is a common step in exams. In order to resolve questions regarding possible authorship, the examiner typically looks at handwriting (Osugba & Agbeyi, 2019).

Dentistry

Because they are stored in the closed chambers of the mouth and can cause an obstruction in a risky circumstance that could prove a link to the crime or death, teeth are important evidence in criminal investigations and useful in forensic investigations. Teeth may retain DNA content and offer post-mortem DNA evidence, even in severely damaged or decayed bodies (Gaytmann, 2003). Forensic odontology, then, is the process of using dental evidence in criminal law. This could entail identifying the deceased, figuring out their age, and discovering sexual assault. Forensic dentistry requires expertise in a number of fields since dental records can be used to identify a person or give authorities the information they need to prove a case (Adams et al., 2013). From bite marks and other unidentifiable remnants, skilled forensic odontologists can help identify a victim. A forensic odontologist may be hired by the police officer conducting an inquiry or the medical examiner.

Mobile Device Forensics

This is the scientific analysis and assessment of data from mobile phones, such as SIM card forensics, call history, and deleted SMS.

The Utilization of Forensic Science in a Criminal Investigation

According to Sarki (2020), forensic science is a collection of scientific fields that are used to address issues in both criminal and civil cases. It includes a variety of approaches and procedures that are mostly laboratory-based, including toxicology and DNA analysis, as well as those that essentially call for knowledge and proficiency in deciphering patterns that are seen, like blood spatter and fingerprints. Forensic science continues to be one of the key instruments used to handle crime problems, both as preventative and reactive tactics, despite certain dependability flaws (Bolden, 2011) and its proven benefits in resolving legal issues (Robertson, Vignaux, and Berger, 2016). One benefit of using forensic science is that it can reduce the pain and involvement of innocent people who are thought to be suspects or accused (Prahlow, 2010; Rudin and Inman, 2000). To trace, identify, and prosecute cybercriminals while keeping the innocent out, for instance, computer forensics can be employed (Mohammed, Mohammed, and Solanke, 2023). Financial crimes can be solved with the use of forensic accounting (Sarki, 2020), and drug abusers and rapists can be recognized by drug analysis (Bennett and Holloway, 2009) and DNA (Campbell and Fehler-Cabral, 2018). Forensic science's ballistic subfields and firearms are powerful instruments for examining crimes involving explosives and firearms, such as terrorist attacks and insurgencies (Sarki, 2020). Along with numerous other advantages for the police department, criminal justice system, and society at large, forensic science may also save time and money (Robertson, Vignaux, and Berger, 2016). By applying forensic science techniques and procedures, modern law enforcement organizations worldwide have increased their capacity and ability to prevent and manage crime. Crimes are now more successfully solved through meticulous inspection of the crime scene and analysis of forensically collected evidence than through traditional inquiry (White et al., 2011). Therefore, the application of forensic science techniques becomes pertinent and significant in Nigerian modern policing.

Significance of Forensic Science

In both police investigations and court cases, forensic science is essential. To assist in the prosecution of criminals and the release of innocent individuals, forensic specialists assess evidence from crime scenes and other sources (Husan, 2022). Justice is ensured, and criminals are identified with the aid of forensic science. The following sums up the importance of forensic science, per Husan (2022):

Crime Tracing
Computer forensic science can be used to locate the computer, cell phone, and email of the culprit who is suspected of perpetrating the crime. Additionally, the IP addresses of the criminals may be tracked, and the location from which they access the website can be determined. His call logs and SMS messages, which he uses to connect with people, might also be recovered by computer forensics.

Suspect Identification
Every crime scene has tangible evidence left by the perpetrator, including DNA, biometric fingerprints, and other types of evidence. Forensic science can precisely identify the offender by examining the tangible evidence discovered at a crime scene.

Linking Crimes to the Suspect
To prove the link between the perpetrator and the crime, trace evidence is utilized. Because trace evidence is so tiny, it could inadvertently spread across surfaces. For the investigating officer, such evidence retrieved from crime scenes can yield strong leads. During a crime, trace evidence may be transferred between people, objects, and the environment.

Determine the Cause and Manner of Death
By doing an autopsy or postmortem examination, forensic science can determine how and why a person died. A comprehensive inspection of the deceased is part of the autopsy or postmortem examination, which looks for evidence of poisoning, disease, trauma, or any other cause that could reveal the cause of death. Police detectives work with forensic specialists to determine the cause of death. To ascertain how and why a person died, forensic pathologists may also confer with anthropologists or entomologists.

Determining the extent of Child Abuse and Sexual Assault
According to Kinsley (2015), forensic science is essential for identifying child abuse, bullet wounds, defensive wounds on a victim, patterns of injuries in victims of domestic violence, self-harm, sexual assault, and sperm semen persistence.

Identifying Alcohol Components
Narcotics, as well as the amount of these drugs and their metabolites, can be detected in criminal tissues by forensic science. Examining the accused's blood, urine, or other biological samples allows for their identification.

Establish the Guilt or Innocence of Possible Suspects
Establishing beyond a reasonable doubt whether the suspect committed the conduct or was not involved is difficult in the absence of an eyewitness. The presence or absence of the suspect in the crime can be confirmed by forensic science. It can be utilized to reveal significant links between the culprit and the crime, as well as to help identify a suspect. Thus, it aids the court in determining whether potential suspects are guilty or innocent.

Narrow the Range of Possible Suspects
Crimes that are suspected of being connected can be linked together using forensic evidence. For example, a criminal may be linked to many crimes using DNA evidence. The investigating officer can identify and prosecute fewer potential suspects thanks to this relationship between the offenses.

The Challenges of Forensic Crime Investigation in Nigeria
Only a small percentage of Nigeria's higher education institutions now provide forensic science. These few forensics providers lack the necessary knowledge and tools. Nigeria currently lacks professionally qualified forensic professionals despite the obvious need for forensic science. Due to inadequate training and equipment, many crimes remain unsolved. Because there are no DNA labs and very few forensic and ballistics specialists in the nation, police officers hardly ever take fingerprints. Nigeria is the most populous country in Africa and one of the continent's oldest democracies, with a population of about 160 million. However, even Nigerians acknowledge that its criminal justice system is appalling. Because our legal system lacked a forensic connection to the crimes in order to convict and vindicate them, respectively, many offenders have escaped punishment, and

many innocent persons have been punished (Kelvin, 2017). The majority of investigations that call for the assistance of forensic scientists either never get looked into at all or, if they do, it will cost astronomical amounts of money to bring in experts from other countries. Nigerian prosecutors, particularly police prosecutors who frequently display egregious incompetence while addressing criminal matters in lower courts, lack the necessary and appropriate training. When they mishandle evidence required to support a case, they act unprofessionally, which can either delay the case or result in the acquittal of a guilty party.

Only four forensic labs are owned by the Nigerian government: the two police forensic laboratories. The first forensic laboratory was established in 1986 at the Force Criminal Intelligence and Investigation Department (FCIID) in Alagbon, Lagos. The laboratory was later reported to be abandoned due to inadequate and outdated facilities (Adebola, cited in Olaniyi, 2022). The second forensic science laboratory was commissioned in 2016 at the Nigeria Police Headquarters in Abuja, to complement the older facility. The second laboratory was developed to support investigations through technologies such as iris and facial recognition, as well as digital resource center capabilities (Punch Newspapers, 2016). The first National Drug Law Enforcement Agency (NDLEA) forensic laboratory was established in Lagos in December 1989 to combat substance abuse and illicit drug trafficking in Nigeria (NDLEA, 1989/2025). The first DNA forensic laboratory was established by the Lagos State Government independently in Nigeria in 2017. But these facilities aren't being used to their full potential. Despite the 1999 Federal Republic of Nigeria constitution's provisions for forensic evidence, the executive branch has been unable to develop any legislation on forensic science. Funding for 21st-century forensic science research and development is lacking in Nigerian law enforcement organizations. The funding for office renovations, salary increases, and new car purchases is the only clear funding source linked to the criminal justice system. There is a need for continuous research and development in the areas of forensic science. (Alisigwe & Oluwafemi, 2019).

Corruption amongst Agencies of the criminal justice system, whereby justice is sold to the highest bidder. The Police Force is characterized by so much corruption that they can manipulate evidence or even destroy it to favor a rich party in a case or investigation (Keltus,2017). Post-traumatic stress in cases involving murder was found to be a challenge faced by investigators as it was caused by years spent as a forensic science investigator, personality type, emotional intelligence, homicide experience, fatigue, and death anxiety (Yoo, Cho, Cha, & Boo, 2013). The problem with forensic science as used by the police is the absence of robust forensic intelligence and trustworthy databases, which are particularly important in proactive policing (Crispino, Rossy, Ribaux & Roux, 2014). Other writers pointed to issues with the current police structure as obstacles to using forensic science. For instance, according to Gabel (2014) and Edmond (2014), police and even other purported forensic science recipients are unable to realize the benefits of the science due to the absence of established regulations for the operation and application of forensic outputs. According to Kelty, Roberta, Bruenisholz, and Wilson-Wilde (2018), multidisciplinary differences provide a significant obstacle to the police's use of forensic science. These differences manifest as discord and miscommunication amongst investigation personnel from various professions throughout operations. This is particularly relevant in cases of trans-border crime, such as drug trafficking and human smuggling. The police's use of forensics was also seen to be hampered by inadequate labs and staff. Police also had to deal with corruption, power shortages, and inter-agency cooperation when applying forensic science (Obafunwa, Faduyile, Soyemi, Eze, Nwana, & Odesanmi, 2018). According to Lee & Pagliaro (2013), police and other practitioners have issues with forensic investigation due to dubious results resulting from improper methodology, contamination, and a lack of standardized protocols.

According to a different study, police use of forensic science is influenced by cultural, economic, and political restrictions, the categories of victims involved, the nature of the crime committed, and the format of the investigation (Puerto & Tuller, 2017). Policy concerns as well as problems with specificity, accuracy, and validity were discovered to be related to lie detection using functional magnetic resonance imaging (fMRI) (Farah et al., 2014).

Prospects of Forensic Science

Despite being one of the most advanced countries in Africa, Nigeria is regrettably lagging in terms of forensic compliance. The creation of a DNA database will be a positive step. The Federal Government's determination to prioritize forensics in our legal system is currently the most crucial requirement. These include improving the training of forensic specialists and establishing uniform forensic labs. Improving Nigeria's internal security ought

to be a top priority. It is conceivable that the Lagos State Government has taken action to open Nigeria's first DNA forensic laboratory (Keltus, 2017). First, a National Forensic Science Research Institute should be established to address the near-complete lack of forensic science labs, scientists, and technicians. Training forensic scientists and professionals and conducting forensic science research should be the main goals of such a research organization. The Federal Ministry of Science and Technology, the Federal Ministry of Interior, the Nigeria Police, and the Police Service Commission should all share oversight over the institute's establishment, funding, and location. The establishment of forensic laboratories throughout the nation, which would offer forensic testing and analysis services to the Nigerian Police and other forensic service consumers, should be one of the forensic sciences research institute's other mandates. Finding and keeping the evidence required for forensic analysis and criminal justice would be greatly aided by this. Furthermore, the integration of forensic science into Nigeria's universities will improve the education of forensic science specialists, raise awareness, pique interest, and result in specialization and proficiency in the area in Nigeria. To make sure that society is not continuously endangered by new trends in crime, particularly those with a forensic bent, the government should make sure that it provides research funding on forensic science to the criminal justice sector. Nigeria should take a cue from other developed countries. For example, the United States of America funds its Federal Bureau of Investigation (FBI), Central Intelligence Agency (CIA), Bureau of Justice Statistics (BJS), and National Institute of Justice (NIJ) adequately. This is the reason America is growing quickly because crime is being tracked, managed, and eradicated due to the law enforcement agencies' alertness and modernity (Alisigwe & Oluwafemi, 2019).

Theoretical Thrust Deterrent Theory of Crime Prevention

This theory's proponents are the English philosopher and reformer Jeremy Bentham, who wrote an Introduction to the Principles of Morals and Legislation (Introduction to the Principles) in 1781, and the Italian economist and philosopher Cesare Beccaria, who wrote an Essay on Crimes and Punishments in 1764. According to the deterrence hypothesis, criminal sanctions serve as a deterrent to future offenders as well as a means of punishing offenders. Following a high-profile occurrence where an offender appears to have received a short punishment, many people refer to the necessity to deter illegal conduct. Some contend that a harsher punishment would have avoided the catastrophe and might stop one of its kind from happening again. According to Beccaria, regulations are in place to enable a cohesive community free from the dangers of conflict and anarchy. He believed that everyone in this society would constantly try to take from others, not only their share, but also others'. Therefore, laws were required, and breaking them should be punished with the sole intent of deterring future offenders. Since there is nothing to stop men from committing the greater crime when it brings a higher advantage, he maintained that punishment must be commensurate with the crime committed. Beccaria also underlined that punishment ought to be administered as soon as possible after a crime is committed, adding that "certainty of punishment is more effective in preventing crimes than severity of punishment" (Johnson, 2019).

The theories of Bentham were comparable. He started by arguing that pleasure and pain control human behavior. He maintained that everyone's actions are meant to make them happier. According to this utility concept, people take actions to either create benefits or avoid suffering or misery. The intensity, duration, clarity, and proximity of a pleasure or pain determine its value.

According to both theories of human conduct, people act in ways that are motivated by their desire to obtain pleasure and elevate themselves by stealing more than is fair. However, by enforcing penalties for specific behaviour, people can be dissuaded from hurting others under the rationality principle. Potential offenders were supposed to weigh the benefits of committing a crime against the benefits of avoiding committing one, according to Beccaria and Bentham. The notion basically says that people won't commit a crime if the cost of doing so is sufficiently high. A three-pronged theory of criminal deterrence based on the writings of Beccaria, Bentham, and Becker posits that certainty, the severity of punishment, and its timing all work together to raise the cost of action to the point where a reasonable person would conclude that the cost surpasses the gain. The fear of harsh punishment is ineffective if there is no chance of ever being caught, since certainty pertains to the likelihood of being caught. Celerity refers to the pace at which a consequence is applied; it suggests that punishment meted out right away following an incident has a greater impact than punishment meted out years later. Since a reasonable person could commit a crime that benefits others even if the penalty is quick and certain, the severity of the punishment is an essential element. Furthermore, the punishment serves as a model for the rest of society, making it clear to everyone that a particular behavior is prohibited (Johnson, 2019).

The application of deterrent theory to this discourse is that the police utilize forensic science in their crime investigations to apprehend the actual culprit and punish them proportionally to the crime committed. Then the severity of the punishment according to a particular crime will discourage and deter others from committing similar crimes when they weigh the possibility of being caught through forensic evidence and the consequences. The intensity with which people commit crimes will reduce because of the availability of forensic evidence in crime investigations.

Discussion of Key Issues

Criminalistics, another name for forensic science, is the use of scientific ideas and techniques to assist in criminal and civil court decisions. The high crime rates in Nigeria may be solved via forensic science. All signs point to the fact that forensic science will lower the crime rate in Nigeria if it is appropriately incorporated into the criminal justice system, particularly in the police and courts. According to forensic scientists, forensic crime investigation starts at the crime scene and will discourage people from committing crimes, usually because it is difficult to commit evil without being caught. Whether there is a bloodstain, human remains, saliva, narcotics, ballistics, weapon residue, alcohol, etc., the right investigation, gathering, and preservation of evidence are crucial for establishing facts and guaranteeing accurate appraisal and interpretation of the evidence. The evidence discovered at the crime site is examined and interpreted by forensic scientists. This procedure comprises methodically looking for physical clues at crime scenes. It identifies the offender, the crime site, the victim, the time the crime was committed, and the manner in which it was carried out. With the use of more sophisticated and trustworthy evidence gathered from contemporary forensic science technology, modern policing has progressed beyond depending solely on eyewitness accounts or tortured confessions. This development in forensic science technology helps the police find culprits and clear innocent people. Automated Fingerprint Identification Systems (AFIS), Live Scan Fingerprint Capture Devices, and Forensic Facial Image Identification Devices (typically derived from digital cameras, smartphones, and CCTV footage) are some of the technologies used in criminal investigations today. Even more obvious is the fact that, despite the high crime rate plaguing the nation, Nigerian police officers underuse forensic scientific methods when investigating crimes.

Physical evidence and biological evidence are the two categories of forensic evidence. Whereas biological evidence contains organic materials like blood, saliva, urine, sperm, and hair, physical evidence is made up of inanimate artifacts like fingerprints, fibers, glass, drugs, and bullets. The methods and techniques used in dentistry, autopsy, computer evidence, and other forensic evidence, also known as DNA evidence, are mostly focused on identifying the suspect and clearing the innocent. Forensic evidence plays a crucial role in tracking down crimes, identifying suspects, connecting crimes to suspects, figuring out the cause and manner of death, assessing the degree of sexual assault and child abuse, identifying alcohol components, proving the guilt or innocence of potential suspects, and reducing the number of potential suspects. Nigeria has 264 universities, including federal, state, private, and corporate institutions, according to the National University Commission (NUC). (Punchng.com). Only about 19 universities provide forensic science, and these institutions lack the necessary resources and knowledge. Due to a shortage of professionally educated forensic specialists, Nigeria must rely on outside experts, who demand astronomical rates. Only four forensic laboratories are available to the Nigerian government, and they are not being used to their full potential. The Nigerian government's underfunding of the Research and Development Act in relation to forensic science is another notable problem (Alisigwe & Oluwafemi, 2019). They only provide money for salary increases, officer quarters renovations, and the acquisition of new cars.

Conclusion

In order to use forensic science effectively in crime prevention and control, police officers must possess the requisite knowledge and skills. By identifying suspects for appropriate prosecution and exonerating innocent persons from false accusations, forensic science helps ensure the prompt administration of justice. As an evidence-based process, forensic science encompasses several scientific disciplines and incorporates cutting-edge medical and technological innovations. A forensic expert must be capable of collecting biological samples while observing necessary safety protocols, including the proper handling and storage of materials such as blood, semen, saliva, hair, and other trace evidence. When these procedures are properly followed, forensic science can significantly enhance the delivery of timely justice in modern society. Undoubtedly, reliable and well-documented forensic reports meet societal expectations of forensic professionals. In contemporary times,

criminals employ increasingly sophisticated methods to perpetrate crimes, making it nearly impossible to conduct effective investigations without the application of modern scientific techniques. Consequently, forensic science has become increasingly vital in the modern era, as it enables the resolution of complex and mysterious crimes through innovative investigative procedures.

Recommendations

These recommendations are put forward for this study:

- The scope of forensic science should not be limited to examining tangible evidence following a crime. It ought to be applied as a proactive as well as a reactive security measure. For instance, combating cases of theft, robbery, murder, rape, and even pedophilia is just as important as finding solutions to the various security issues plaguing the nation, such as terrorism, kidnapping, human trafficking, and arms trafficking. To combat these security issues simultaneously, forensics should be created.
- However, to handle the tiresome task of providing forensic security services in Nigeria, the police and other security organizations must receive specialized training.
- As a crucial component of criminal justice and security development, the Nigerian government should provide sufficient funding for the development of forensic skills, considering the enormous expense involved. • Forensic labs should be maintained and made available to the police and other security forces so they may classify fingerprints and identify materials that could be used as evidence. These will improve the efficacy and efficiency of police investigations and prosecutions of crimes.
- Incorporating forensic science into Nigeria's universities will improve the education of forensic science specialists, raise awareness, pique interest, and result in specialization and proficiency in the discipline. • The Ministry of Information and the criminal justice sector should work together to make sure that society is properly informed about how crime scenes can be handled. People should be instructed to avoid crime scenes. Additionally, the investigators should make sure they don't linger at the scene.

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