



MURDER INVESTIGATION IN NIGERIA: IMPLICATION FOR FORENSIC SCIENCE APPLICATION

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Abstract:

This study presents a systematic review of studies related to murder and criminal investigation, policing, and implications for forensic science application in Nigeria. A literature search was done in the English language, using primary and secondary keywords; such as murder investigation, forensic science, policing, criminal investigation, standard operating procedures guiding murder investigation, and application of forensic science in Nigeria. Four academic databases selected for the study were: SAGE Online, Wiley Online Library, Science Direct, and Google Scholar. Following the inclusion and exclusion criteria earmarked for the study, 16 selected online published materials published between 2012 and 2022 met the predetermined criteria. These articles are either surveys, reviews, case studies, expert opinion materials, or theoretical articles. Central to the findings of these articles is that the application of forensic science in murder investigations in Nigeria is still suboptimal, accounting for lots of cold and unresolved murder cases across the country. In addition, there are other issues such as inadequate legislation governing forensic science application in Nigeria, lack of forensic skills and poor capacity development of Nigerian police, and non-adherence to forensic validated procedures during murder investigations. Gaps identified from these studies suggest a need for research focusing on the importance of suspect forensic profiling, a criminal investigative tool that can aid in narrowing down the suspect pool which has become a perennial problem in Nigeria's justice system as evidenced by the rising number of

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murder suspects across the country's penitentiaries. This would make murder investigation more effective and efficient for criminal justice experts.

Keywords: criminal justice, forensic science, murder investigation, policing, suspect profiling

1. Introduction

One of the major challenges confronting Nigeria as a nation is the prevalence of murder and intentional homicide. According to Ope-Ogunseitan (2016), murder remains a significant portion of Nigeria's annual criminal prosecutions. Murder undermines peaceful coexistence and harmonious relations and disrupts social orderliness, the very fundamental responsibility of the Nigerian government. This governmental responsibility is enshrined in Section 14(2)(b) of the 1999 Constitution of the Federal Republic of Nigeria (FRN) as amended. It declares that the security and welfare of the people shall be the primary purpose of government.

Increasing murder incidents have eroded the capacity of the government to discharge its statutory obligation of protecting the lives of its citizens. Being the most atrocious and notorious crime that threatens and violates religious and socio-cultural norms (Mohammad Rahim *et al.*, 2016), it constitutes a clog in the wheel of many nations' socio-economic growth and development. Murder is thereby classified as a *mala in se* crime owing to its universal recognition as an inherently immoral act, regardless of legal statutes or whether the action is criminalised. This crime represents the most serious end of the spectrum of violent crime (Mohammad Rahim *et al.*, 2016), affecting victims, murderers, their families, and the wider community.

Unfortunately, most murder cases in the country remain cold and unresolved due to the absence of forensic evidence (Nte, 2012; Obafunwa, 2015; Ope-Ogunseitan, 2016, Obafunwa *et al.* 2018, Otu & Elechi, 2018). While forensic investigation has been effective in developed countries such as the United Kingdom and the United States in resolving several crimes, the Nigeria scenario is said to be a failure (Otu & Elechi, 2018). Some of the reasons adduced for the sub-optimal application of forensic science culminating in many unresolved crimes include the lack of forensic evidence due to the absence of forensic experts and inadequate forensic facilities (Alisigwe & Oluwafemi, 2019; cited in Ezegbogu & Omede, 2023).

In a few instances where evidence is provided by the police, more often than not, such are nulled and voided as they are devoid of probative value; which is a prerequisite for successful criminal prosecution. Some of the challenges responsible for this are due largely to non-adherence to international investigative protocol and best practices (Obafunwa *et al.*, 2018). Although evidence is the cornerstone of criminal trials especially in murder or intentional homicide cases, however, such requires the use of science and law to enhance its validity and acceptance in courts (Obafunwa *et al.*, 2018).

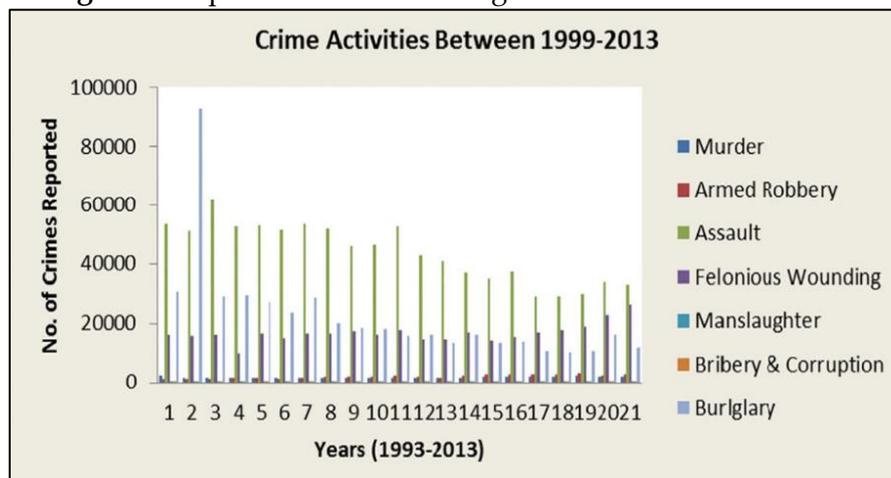
Meanwhile, the importance of forensic science in murder investigation cannot be downplayed. Apart from aiding identification of murder suspects and potential culprits

through objective analysis of evidence such as using fingerprints, footprints, blood drops, and hair strands; it also enhances the justice dispensation process by providing concrete and irrefutable evidence that can tie the suspects to the crime (Obafunwa *et al.*, 2018). The application of forensic science could further aid the prosecution of criminals or absolve an innocent person from a wrongful conviction. After wrongful convictions, an increasing number of awaiting trials within the Nigerian penitentiaries is likely.

Despite the recognition of the usefulness and the importance attached to the application of forensic science in criminal investigations, there still exists a noticeable gap in understanding the specific impact of forensic science in resolving murder cases in Nigeria. There is limited research on why the murder clearance rates are still low, notwithstanding the political will and commitment of the Nigerian government. There is also a dearth of thorough evaluations in the literature regarding the public and law enforcement agencies' knowledge of the value and possibilities of forensic science in murder investigations.

Against this backdrop, this study seeks to unearth why there has not been a significant increase in murder clearance rates in Nigeria despite commitments by both the Nigerian government and the Nigeria Police Force (NPF). Additionally, the study seeks to investigate the challenges inhibiting the proper integration of forensic science applications into the country's criminal justice system.

Figure 1: Reports of Murder in Nigeria between 1993 and 2017



Source: Oguntunde *et al.*, 2018

Figure 1 above depicts a graphical representation of different kinds of crime in Nigeria between 1993 and 2013. Generally, the table shows that trends and patterns of crimes in the country have been inconsistent despite government commitments. One of the reasons for not having a robust database regarding crime rates is the lack of synergy between the different government institutions and non-governmental organisations (NGOs). In the year 2016, we recorded the highest number of incidents of murders, although there was no record for the two years preceding that year.

2. Methods

2.1 Data Sources

The study relies on secondary data sources from articles published in refereed academic journals. These articles were sourced from the following academic search engines or databases: SAGE Online, Wiley Online Library, Science Direct, and Google Scholar. Particular preference was placed on online journal articles published between 2012 and 2022.

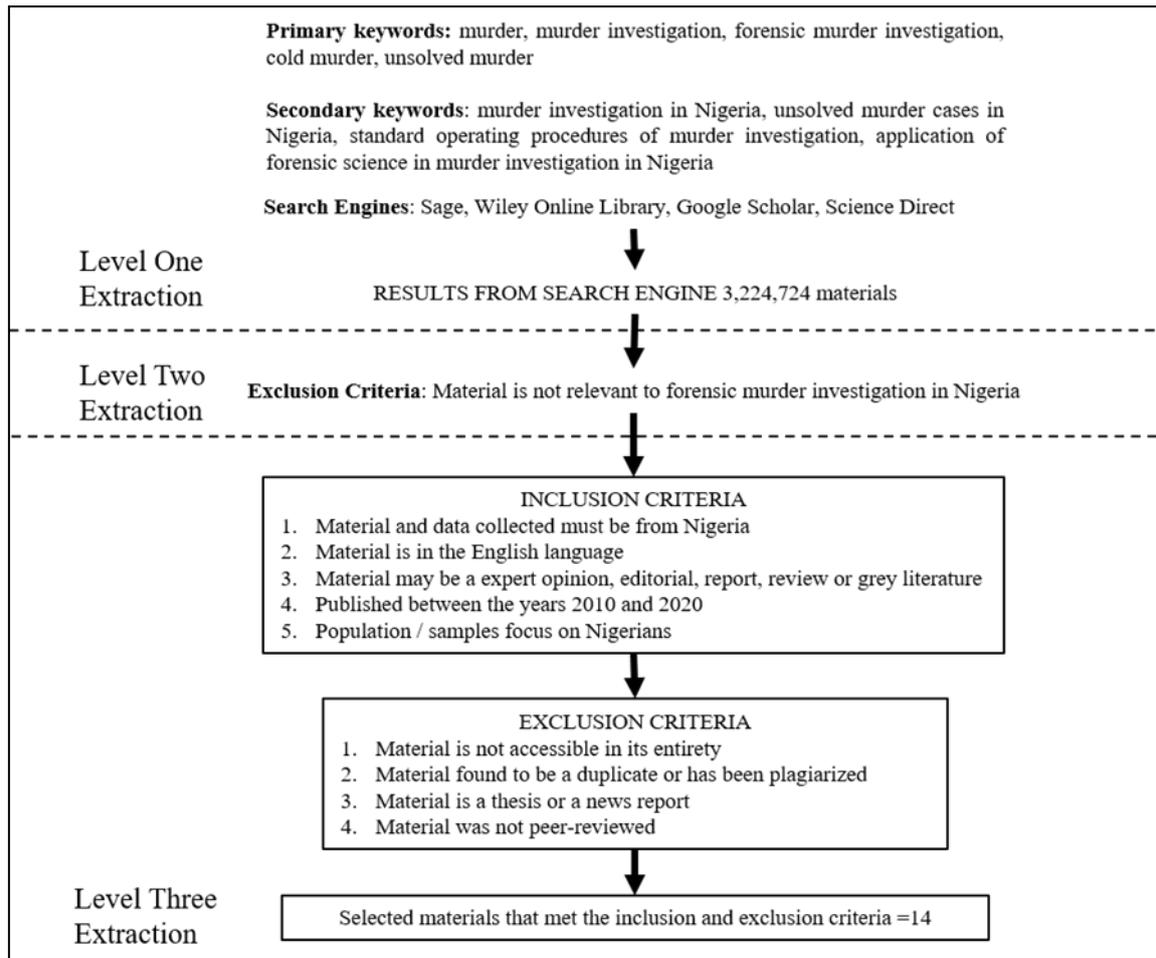


Figure 2: Phases and flowchart for data collection

2.2 Inclusion and Exclusion Criteria

Specific inclusion and exclusion criteria were used to determine the set mining and association rule for the data extraction. These criteria were developed based on the literature review that was carried out to identify common search parameters. The criteria are listed below.

Studies were included if they fulfilled the following criteria:

- 1) The selected materials are indexed in major bibliographic databases for the field,
- 2) The selected materials and collected data must be from Nigeria,
- 3) All selected materials must be in English,

- 4) The materials may be expert opinion materials, editorials, reports, reviews, and grey literature,
- 5) Must be published between January 2012 and December 2021,
- 6) The population samples are focused on Nigerians.

Studies were excluded if they fulfilled the following criteria:

- 1) Unavailability of the full text,
- 2) Materials published other than in English,
- 3) Materials found to have been duplicated,
- 4) Materials were not peer-reviewed.

The phase of a systematic review known as "data extraction" takes place in between the identification of relevant studies and the analysis of the data, which might involve either a quantitative or qualitative synthesis involving the pooling of data for a meta-analysis.

2.3 Data extraction methods

Data extraction is the process through which researchers obtain the necessary information about study characteristics and findings from the included studies. The primary task is to collect or retrieve disparate types of data from a variety of sources, many of which may be poorly organized or completely unstructured. It makes it possible to consolidate, process, and refine data so that it can be stored in a centralized location in order to be transformed meaningfully. This scientific extraction method is critical in gathering information to quantify the danger of bias and the applicability of studies. In this review, three levels of data extraction were used to filter the variables of interest aimed at identifying academic materials related to murder investigations in Nigeria and their implications for forensic science application. At the first extraction level, four primary keywords and four secondary keywords were used to maximize the pool of available literature (Figure 2 is referred to). Across the four databases, a total of 3,224,724 results were identified. Table 1 shows the results of the search in the first extraction level.

Table 1: The results of the search in the first extraction level

Keywords	Google Scholar	Science Direct	Wiley Online Library	SAGE	Total
Primary Keywords					
Murder	1,800,000	37,074	70,592	64,182	1,971,848
Murder investigation	873,000	21,043	33,466	30,042	957,551
Murder suspects profiling	28,100	3,038	5,623	4,198	40,959
Forensic murder investigation	118,000	6,070	5,696	4,217	133,983
Secondary Keywords					
Murder investigation in Nigeria	47,900	685	2,205	1,527	52,317
Unsolved murder cases in Nigeria	14,500	30	134	77	14,741
Standard operating procedures of murder investigation in Nigeria	30,700	195	1,329	805	33,029
Application of forensic science in murder investigation in Nigeria	19,800	71	260	165	20,296
Total					3,224,724

Table 2: Materials included in the review

S/N	Study	Setting	Design/ Method	Focus/ Instrument	Participants & Sample size	Outcomes
1	Obafunwa, J. O <i>et al.</i> (2018). Medical evidence and proof of cause of death in Nigerian courts. <i>Medicine, Science and the Law</i> , 58(2), pp. 122-134.	Nigerian Criminal Justice System	Commentary/ Expert Opinion Article	Critical Review of Decided Court Cases Relating to the Use of Forensic Medical Evidence	Decided court cases (N=14)	<ul style="list-style-type: none"> - most physicians performing autopsies in Nigeria are most often not certified forensic pathologists. - lacuna or shortfall in Nigerian law regarding who can give evidence on medico-legal matters where autopsies are required. - Nigeria police murder investigators do not usually follow forensically validated procedures during murder investigations. - Nigeria's investigative protocol shortfalls of the standard where scientific evidence has probative value. - there is the dearth of forensic science awareness and sensitisation by Nigerian criminal justice practitioners.
2	Aborisade, R. A. (2018). Unsolved murders and the investigative failures of the Nigerian police force: Security and sociopolitical implications. <i>African Security Review</i> .	Nigerian Justice System	Commentary/ Expert Opinion Article	Documented Pieces of Evidence	Murder cases (N=3)	<ul style="list-style-type: none"> - there is inadequate funding and a lack of quality manpower required for effective & efficient murder investigation. - undue political interference with murder investigation as most murder cases have a political undertone. - ineffective investigative approach and dearth of forensic laboratories culminating in lack of robust criminal database or data bank - sub-optimal application of modern information and communication technology.
3	Sarki, Z. M & Geshina, A. M. S. (2020).	Not Applicable	Commentary/ Expert Opinion Article	Literature Review	Published articles (N=14)	<ul style="list-style-type: none"> - no reliable data about what forensic facilities and skills are available and

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	Nigeria Police and Forensic Criminal Investigation: A review of some critical issues, <i>International Journal of Criminal Justice Sciences</i> , 15(1), pp. 21-34.					usable to the Nigerian police & what needs to be improved upon. - the dearth of information regarding the perception of Nigerian police towards the usage of forensic science during a criminal investigation. - application of international law regulating the usage of forensic science in Nigeria
4	Otu, N. & Elechi, O.O. (2018). The Nigeria police forensic investigation failure, <i>Journal of Forensic Science and Criminal Investigation</i> , 9(1), pp. 1-8.	Nigeria Police Force	Commentary or Opinion Articles	Interview/ Critical Review	Published articles, books, and reports (N - undefined)	- insufficient training and capacity of the police by the government - lack of intelligence-information gathering by the police - there still exists a disjoint between NPF modus operandi and technology. - poor forensic skills and non-democratic policing capability by NPF
5	Nwachokor, F. N. (2016). A forensic study of unnatural death in Warri, Delta State, Nigeria. <i>International Journal of Forensic Medical Investigation</i> , 3(1), pp. 8-19.	Central Hospital, Warri, Delta State	Descriptive Retrospective Study	Critical Review of Death Cases and Literature	Cases of unnatural deaths (N=802)	- lack or inadequate and reliable data on mortality rate. -scarcity of scientific publications on different cases of unnatural deaths in Nigeria. - decrease in the rate of utility of autopsy services by law enforcement agencies.
6	Obafunwa, J. O. (2015). Forensic Investigation of Mass Disasters in Nigeria: A Review. <i>The Nigerian Medical Journal</i> , 56(1), pp. 1-5.	Nigerian Aviation Industry	Retrospective Study	Nigerian Aviation Officials' Documents & News Reports	Mass disasters case studies (n=8)	- Nigeria lags behind in terms of global best practices concerning medico-legal investigation of death. - Nigeria lacks proper and well-equipped forensic science laboratories to investigate routine forensic cases. -there is shortage of relevant forensic personnel of all categories.
7	Nwafor, C. C, Ekpo, M. D, Nwafor, N. N, Obafunwa, J. O. (2019).	Not Applicable	Commentary or Opinion Articles	Critical Literature Review	Autopsy case report (N=1)	- the Nigerian police murder investigators should work together with anatomic forensic pathologists.

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	Death in the workplace; Accident or homicide? The role of death scene examination. <i>Ann Trop Pathol</i> , Vol. 10, pp. 68-73.					<ul style="list-style-type: none"> - proper crime scene examination is crucial to the success of medico-legal autopsy; hence, it should be condoned immediately. - many Nigerian police lack proper training in death or murder investigation and the organisation is not well funded. - without forensic pathologists, the nature, causes of death, and death reconstruction cannot be easily ascertained.
8	Alisigwe, O. J. & Oluwafemi, O. M. (2019). The state of forensic science in crime investigation and administration of justice in Nigeria. <i>Int J Sci Eng Res</i> , 10(7), 1720-1725.	Not Applicable	Commentary/ Expert Opinion Article	Critical Literature Review	Published articles, books, and reports.	<ul style="list-style-type: none"> - Nigeria's criminal justice system has not created an enabling environment for forensic criminal investigation to thrive. - The Nigeria Police Force and other security agencies still rely mainly on eyewitness testimonies, circumstantial evidence, and confessions. - despite the reliability, authenticity, concrete and productive nature of forensic evidence in murder investigations, it is still being criticised and underutilised. - the irregularities and delays in the administration of the justice system in Nigeria can partly be attributable to the non-optimal adoption of forensic science principles.
9	Nte, N. D. (2012). An evaluation of the challenges of forensic investigation and unsolved murders in Nigeria. <i>African journal of criminology and justice studies</i> , 6(1), 9.	Nigeria Police Force and the public	Survey	Questionnaire	Police and Public (N=130)	<ul style="list-style-type: none"> - limited commitment and lack of seriousness by the Nigerian government regarding consolidating forensic skills by the NPF. - promulgate laws that will make NPF independent in order to enhance its operational efficiency.

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						<ul style="list-style-type: none"> - update and reinvigorate the jurisdiction and role of the coroner. - Inadequate and non-operational of DNA and other police laboratories. - lack of digital forensics and no database of fingerprints even of suspects or convicts exists.
10	<p>Ope-ogunseitan, M. (2016). Forensics: the missing link in Nigerian criminal investigation. <i>Journal of the Mooting Society University of Lagos</i> 2, pp. 67-83.</p>	Not Applicable	Commentary, Perspective / Opinion Article	Critical Literature Review	Published articles, books, and reports.	<ul style="list-style-type: none"> - need for urgent integration of information and communication technology (ICT) into Nigerian security architecture. - need for Nigeria police to adopt a balanced policing model framework to complement forensic criminals' investigations. - need for revamping and overhauling the existing policing architecture in Nigeria in accordance with Nigeria's own unique reality. - the Nigerian government should make it a priority to enhance police capacity building, intelligence-information gathering, forensic skills and its democratic policing capability.
11	<p>Lawrence, O. A., Christopher, A., & Mudiaga, Z. (2016). Forensic medicine: the story, clinical nexus and challenges of the practice in Nigeria. <i>International Journal of Forensic Medical Investigation</i>, 2(1), 1-4.</p>	Not Applicable	Commentary/ Opinion Article	Critical Review of Literature	Published articles, books, and reports	<ul style="list-style-type: none"> - forensic medicine is not fully domesticated in Nigeria due to sociocultural aversion, financial constraints, and religious objections. - little or no funds for forensic research and development in the field of forensic medicine unlike other sub-specialties (e.g. pharmaceutical) where there is huge support from the industry. - the Nigerian legal system is still very sketchy on the practice of forensic medicine, the old and outdated act of

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						<p>the 1950s is still operational in Nigeria.</p> <ul style="list-style-type: none"> - paucity of trained forensic pathologists and other allied staff coupled with a lack of facilities and equipment.
12	<p>Nwawuba, S. U., & Akpata, C. B. N. (2020). Awareness level on the role of forensic DNA database in criminal investigation in Nigeria: A case study of Benin city. <i>Journal of Forensic Science and Research</i>, 4, 007-014.</p>	<p>Nigeria Police and Students in Benin City, Nigeria</p>	<p>Survey</p>	<p>Questionnaire</p>	<p>Police and the public (N=458)</p>	<ul style="list-style-type: none"> - need for enactment of legislation or a review of the existing ones regarding the use of DNA as evidence. - the establishment of the DNA database is highly recommended. - low level of awareness of the role of a forensic DNA database in a criminal investigation in Nigeria.
13	<p>Nwawuba, S. U., Khadija, A. M., Bukola, A. T., Precious, I. O., & Davidson, E. A. (2020). Forensic DNA profiling: autosomal short tandem repeat as a prominent marker in crime investigation. <i>The Malaysian journal of medical sciences: MJMS</i>, 27(4), 22.</p>	<p>Not Applicable</p>	<p>Commentary/ Opinion Article</p>	<p>Literature Review</p>	<p>Published articles, books, and reports.</p>	<ul style="list-style-type: none"> - unlike most developed countries where DNA profiling and forensic application are optimally utilised, a forensic study in Nigeria is at the neophyte stage. - lack of national DNA database in Nigeria - insufficient policies and legislation on the use and practice of forensic genetics, particularly DNA profiling in Nigeria. - DNA profiling tools aiding the re-evaluation of old murder cases that were considered closed as a result of inadequate evidence.
14	<p>Sylvester, O., & Agbeyi, M. (2019). The use of forensic evidence in criminal investigations (A study of Nigeria police force). <i>International Journal of Humanities and Social Science Research</i>, 5(2), 91-98</p>	<p>The Nigeria Police Force</p>	<p>Survey</p>	<p>Questionnaire & Key Informant Interview</p>	<p>Police and the public (N=189)</p>	<ul style="list-style-type: none"> - inadequate funding of Nigeria police by the government - lack of state-of-the-art forensic facilities & other policing equipment. interference in a murder investigation by the political class and the bourgeoisie.

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						<ul style="list-style-type: none"> - lack of inter-agency collaboration between the police and other quasi-police institutions -non-diligent in the recruitment of police-by-police service commission.
15	Nte, U. N., Nte, N. D., Enokie, B. K., & Bienose, O. (2019). DNA Profiling and the Challenges of Crime Management in Nigeria: The Case of The Nigeria Police Force. <i>JLS, 4</i> , 189.	The Nigeria Police Force	Survey	Questionnaire	Police (N=359)	<ul style="list-style-type: none"> - reliance on the traditional method (old school) of criminal investigation. - non-scientific method of criminal investigation resulting in wrongful prosecution and miscarriage of justice. - conviction of innocent criminal suspects owing to failed courtroom prosecution. - inadequate human and institutional capacity development by NPF.
16	Nwokolo, M & Ivongbe, M. I. (2022). A Review of the forensic science evidence admissibility for handling criminal prosecution in Nigeria, <i>Law Audience Journal, 3(4)</i> , 284-300.	Not Applicable	Survey Design	Questionnaire & Structured Interview	Police & other law enforcement agents, legal practitioners, professional auditors, forensic experts etc. (N=75)	<ul style="list-style-type: none"> - during prosecutions, virtually all the confessional statements are challenged on grounds of Police coercion - need for a standard in scientific interpretation of results in forensic science labs in order to serve as a point of reference in framing expert reports. - inadequate laws regulating the application and enforcement of forensic science in Nigeria. - non-standardisation of forensic evidence inhibits effective and efficient criminal trials.

Following the first extraction level, all the academic materials were filtered in compliance with the exclusion criteria for the second extraction level. This resulted in purposively selecting only 40 materials. Considering the predetermined criteria for materials to be selected and included in the analysis, only 16 materials were suitable at the end of the third extraction level. Table 2 shows the breakdown of the academic materials that were eventually reviewed for the study.

3. Findings

3.1 Design and Method of Reviewed Literature

Authors of various literature reviewed for this study employed different methodologies. These methods comprised mixed-method (quantitative and qualitative), quantitative, qualitative, and perspective, commentary or opinion. Data collection was performed by authors using different instruments. This ranges from questionnaires, semi-structured and in-depth interviews, and documentation methods.

Nine articles, from among the 16 articles reviewed for this study (see: Obafunwa *et al.*, 2018; Aborisade, 2018; Ope-Ogunseitan, 2016; Nwawuba *et al.*, 2020a; Nwawuba *et al.*, 2020b, Lawrence *et al.*, 2016; Sarki & Geshina, 2020; Nwafor *et al.*, 2019; Alisigwe & Oluwafemi, 2019) were either perspective, commentary or opinion articles. These articles reviewed important issues around forensic science and murder investigation in Nigeria. This is followed by some challenges or impediments militating against the optimal application of forensic science.

Next, five articles reviewed (see: Nte, 2012; Sylvester & Agbeyi, 2019; Nte *et al.*, 2019; Nwawuba & Akpata, 2020; Nwokolo & Ivongbe, 2022) were quantitative studies. In these quantitative studies, respondent groups varied from one study to another. While some of the respondents were law enforcement agents (the police), there were also students of criminal justice and members of the public. Survey questionnaires were administered directly to the respondents. The number of respondents for each of these five studies ranged between 130 and 458 respondents.

The remaining two articles reviewed (see: Obafunwa *et al.*, 2015; Nwachokor, 2016) were descriptive or retrospective studies. The first of these two articles critically reviewed 802 cases of unnatural deaths in a central hospital in Warri, Delta State, while the second retrospective article reviewed eight mass disaster cases within the Nigerian aviation industry.

3.2 Non-adherence to forensic validated procedures during murder investigations

Under this section, issues around forensic validated procedures during murder investigations were investigated. The commonly validated forensic procedures during murder investigation include a collection of physical evidence, examination and analysis of evidence, expert testimony, and validation of forensic tools and procedures geared towards ensuring evidence accuracy and reliability (Obafunwa *et al.*, 2018; Nwafor *et al.*, 2019).

Despite the importance of adhering to forensic-validated procedures guiding murder investigation, Nigerian police still lag behind in terms of policing standard operating procedures and criminal investigative protocols (Obafunwa, 2018). Meanwhile, adhering to the forensic validated procedures would ensure strict compliance with legal requirements and standards, safeguarding the integrity of the investigation and ensuring admissibility of evidence in court. This would in turn help mitigate the risks associated with complex murder investigations, thus reducing the likelihood of general procedural errors.

Four studies (Nte *et al.*, 2019; Alisigwe & Oluwafemi, 2019; Obafunwa *et al.*, 2018; Ope-Ogunseitan, 2016) attributed the suboptimal performance of the Nigeria police in murder investigation to non-adherence to validated forensic procedures. Nte *et al.*, (2019) further argued that notwithstanding the importance of the scientific method in analysing crime-related evidence, the Nigerian police most often still rely on the traditional method, such as eyewitness testimonies, circumstantial evidence, and confessions. This has further resulted in wrongful prosecution and miscarriage of justice characterising the country's justice system.

Obafunwa *et al.*, (2018) also alluded that the Nigeria police's modus operandi of criminal investigation falls short of validated procedures and international best practices. He alluded the dearth of forensic science and its application to lack of awareness and sensitisation by Nigerian criminal justice practitioners (police, courts, and correctional facilities). Acknowledging this fact, Ope-Ogunseitan (2016) suggested that the leadership of Nigerian police should make it a priority to build and enhance Nigeria's police capacity in forensic skills and intelligence-information gathering. This would further enhance proactive policing as against the traditional reactive policing system.

In the same vein, Alisigwe & Oluwafemi (2019) further attested that no provision has been made by the Nigerian justice system for forensic criminal investigation to thrive. They further observed that despite the reliability, authenticity, concrete, and productive nature of forensic evidence in the murder investigation; it was still being underutilised in Nigeria. At times, even in the contemporary time, when the need to embark on forensic investigation arises, especially in high-profile murder cases, the Nigerian police still partners with other investigative international police bodies.

Apart from limited functional forensic laboratories and laboratory technicians in the country (Nte, 2012; Obafunwa, 2015; Obafunwa *et al.*, 2018, Otu & Elechi, 2018; Aborisade, 2018, Nte *et al.*, 2019), the few available infrastructures are moribund with no state-of-the-art equipments. Applying forensic procedures would no doubt aid in the assemblage of scientific evidence having probative value or having a higher tendency of reaching its evidential purpose of a relevant fact. This will reduce the number of murder case files littering Nigerian courts as certain cases will not come up in court because specific forensic investigation conditions have not been met (Obafunwa *et al.*, 2018).

3.3 Dearth of forensic skills and capacity development

In this section, forensic skills and capacity development of Nigerian police murder investigators (NPMIs) were examined. Seven materials (Obafunwa, 2015; Ope-

Ogunseitan, 2016; Lawrence *et al.*, 2016; Obafunwa *et al.*, 2018, Otu & Elechi, 2018; Aborisade, 2018; Nwafor *et al.*, 2019) were. Nwafor *et al.* (2019), argued that most Nigerian police lack proper training and capacity development on how to forensically investigate murder cases. Although there have been trainings targeted towards addressing this gap, nonetheless, such training and capacity development in forensic science is insufficient (Otu & Elechi, 2018). Earlier, Obafunwa (2015) claimed that not only is Nigeria police deficient in forensic skills and capacity, but there is also a dearth of other relevant forensic personnel in Nigeria. For instance, there is also the dearth of forensic pathologists and laboratory technicians required for most medico-legal cases (Obafunwa *et al.*, 2018). This has resulted into situations where medical practitioners who are not certified forensic pathologists are invited to conduct forensic pathological analysis during a murder investigation (Nwafor *et al.*, 2019).

This run contrary to the provision of Section 68 of the Nigerian Evidence Act which requires that only medical experts can give medical evidence or opinion medico-legal cases. This resonates with the findings of Lawrence *et al.* (2016), that there is a paucity of trained forensic pathologists and other allied staff, coupled with a lack of forensic facilities and equipment in Nigeria.

Recognising this fact, the Nigerian government and the NPF have come up with several programmes aimed at enhancing forensic training and capacity development of the Nigeria police (Obafunwa *et al.*, 2018). Few of such was the upgrades of Nigeria police criminal database to boost forensic investigation by the Inspector General of police, emergency approval of the fund for the emergency procurement of digital tracking devices to combat criminality across the country by Nigerian President among others.

However, little or no result has been achieved as training results are not measured, even if they are applied given the poor state of infrastructure and lack of appropriate equipment. Hence, it behooves the Nigerian government to make it a priority to enhance police capacity building, intelligence-information gathering, forensic skills and democratic policing capability (Ope-Ogunseitan, 2016). Some of the reasons adduced for suboptimal performance of the NPF is corrupt practices which has eaten deep into the fabric of the institution for decades (Alemika, 2010). Funds earmarked for training and capacity development are at times diverted for personal use. Police corruption is unfortunately a major hindrance to positive contributions and change initiatives.

3.4 Inadequate legislation governing forensic application in Nigeria

In this section, issues surrounding laws regulating the application and enforcement of forensic science during a criminal investigation in Nigeria were explored. Six materials (see: Nte, 2012; Obafunwa *et al.*, 2018; Nwawuba *et al.*, 2019; Alisigwe & Oluwafemi, 2019; Nwawuba *et al.*, 2020; Nwokolo & Ivongbe, 2022) from the 16 materials reviewed for the study were examined.

Referring to Table 1, these materials were mostly opinion or commentary articles. Nwokolo & Ivongbe (2022) posited that the application of forensic science during a murder investigation is hindered by a lack of specific legislation governing its application. This raises legal concerns about the standardisation, admissibility, and

interpretation of forensic evidence which is the foundation or cornerstone of all criminal trials including murder trials (Obafunwa *et al.*, 2018). Obafunwa *et al.* (2018) earlier posited that such evidence must be logical and rational and must have legal relevance to the application of issues and law.

Nte (2012), therefore, suggested that the Nigerian law relating to the murder investigation and the application of forensic by the Nigerian police be reviewed, updated and independent in order to enhance police operational capacity. This would make the police more impartial in discharging their statutory responsibilities. He suggested further that Nigerian lawmakers should promulgate laws that will strengthen the police institution and enhance its operational efficiency. More recently, Obafunwa *et al.* (2108) also decried the gap or shortfall in Nigerian laws regarding the application of forensic science in murder investigations.

For instance, in many of the medico-legal cases requiring post-mortem analysis, it is unclear who can testify and give evidence during criminal trials (Obafunwa *et al.*, 2018). There are lots of instances where any medical practitioner could be called upon to give an expert opinion, regardless of whether such individuals have the relevant professional qualifications and expertise (Nwachokor, 2016). Nwawuba *et al.* (2020) also admitted that the absence of specific laws governing the application of forensic science has accounted for the failure of so many criminal trials. The Nigerian courts still accept forensic DNA evidence presented by either the defense or prosecution, even though the admissibility of such evidence is not universal across the country due to a lack of a unified legal framework (Nwawuba, 2019). The non-recognition of forensic science by Nigerian law affects the country's justice system's effectiveness, efficiency and reliability, despite its recognition elsewhere.

4. Conclusion

Lots of cold and unresolved murder cases littering Nigeria's criminal justice system can be resolved through the practical application of forensic science techniques in every stage of the investigation. The NPF is not completely unaware of the role of forensic science towards enhancing murder clearance rates but is hindered by inadequate funding, dearth or paucity of forensic infrastructures, lack of legislation backing forensic validated procedures, and poor forensic training of police murder investigators among others. These issues among others urgently need to be addressed in accordance with modern realities going forward.

In addition, a literature search from 2012 to 2022 did not provide any study advocating or suggesting the need for the integration of suspect forensic profiling (SFP) as an indispensable part of murder investigation in Nigeria. SFP is very important especially at the preliminary stage of murder investigation because of its role in streamlining the number of murder suspects that would be investigated. Most studies regarding murder investigation in Nigeria only concentrate on the general applicability of forensic science not minding the specific such as the SFP. This is one of the gaps that this study intends to fill.

Understanding the knowledge of profiling and other behavioural sciences will help in narrowing down the scope of investigation, thus enhances effective and efficient murder investigation. This would further narrow down the number of murder inmates across the Nigeria's penitentiaries. Research also needs to be conducted to determine the depth of knowledge, experience or technical know-how of Nigerian police regarding the use of SFP. Non-profiling of suspects accounts for why there are more criminal suspects than convicted criminals within the Nigerian penitentiaries. This would enhance murder case management and reduce the number of people within Nigerian correctional facilities. SFP would aid analyses of crime scene evidence, behavioural patterns, and other relevant information to develop a psychosocial and criminogenic profile of murderers. It would also aid investigators' understanding of the motivations, characteristics, and potential actions of the offender, further aiding in the investigation and developing proactive crime prevention strategies.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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