



The Correlation of Forensic Science Role: Forensic Photography, Forensic Toxicology and Digital Forensics Towards the Evidence in the Criminal Justice System

Ersa Nurul Rahma Windyani¹, Femalie A. Acbay²

¹Undergraduate Law Student, Universitas Bhayangkara Jakarta Raya, Jakarta, Indonesia, email: ersanurulrahma@gmail.com

²Undergraduate Criminology Student, University of Mindanao, Davao City, Philippines, email: f.acbay.519005@umindanao.edu.ph

Corresponding Author: Ersa Nurul Rahma

Abstract: The Role of Forensic Photography, Forensic Chemistry Toxicology and Digital Forensic on Pembuktian is a scientific article in the literature review within the scope of the field of Law and Criminology. The purpose of this article is to build a hypothesis of the influence between variables that will be used in further research. Research objects in online libraries, Google Scholar, Mendeley and other academic online media. The research method with the research library comes from e-books and open access e-journals. The results of this article: 1) Fotografi Forensik has an effect on Pembuktian; 2) Toksikologi Forensik has an effect on Pembuktian; and 3) Forensik Digital has an effect toward the Evidence.

Keyword: The Evidence, Forensic Photography, Forensic Chemistry Toxicology, Digital Forensics

INTRODUCTION

The system of evidence in Criminal Justice and Forensic Science is something that cannot be separated where Criminal Law as a system that functions to regulate human behavior provides rules, punishments, responsibilities and rewards that are applied to cases and are tried in the court. The court is a place of law where seeks closure at the end of every performance, listing off guilt, damages, awards, and penalties, and reaffirming the legal order that sets the stage for all future legal action. Through acts of violation of the rules in criminal law, the evidence is using forensic science that it needed in the criminal justice system.

Forensic science does not have any official recognition or registration that is supposed to give forensic scientists certain rights and responsibilities. Overall, it is true that an inaccurate perception or belief of forensic's evidence can have a devastating effect, especially when an erroneous forensic analysis results in a failure in the judicial process. Others relevant articles are needed to strengthen the theory that being researched, to see the relationship or influence between variables and build hypotheses. This article discusses the correlation of the role of

Forensic Photography, Forensic Toxicology, and Digital Forensics on Evidence, a literature review study in the fields of Law and Criminology.

Based on this background, the purpose of writing this article is to build a hypothesis for further research, namely to formulate: 1) Correlation of the relationship between Forensic Photography and Evidence; 2) Correlation between Forensic Toxicology and Evidence; and 3) Correlation between Digital Forensics and Evidence.

METHODS

The method of writing this Literature Review article is the Descriptive Qualitative method and Library Research, sourced from the Google Scholar online application, Mendeley and other online academic applications. In qualitative research, literature review must be used consistently with methodological assumptions. This means that it must be used inductively so that it does not direct the questions posed by the researcher. One of the main reasons for conducting qualitative research is that it is exploratory in nature, (Ali, H., & Limakrisna, 2013).

RESULT AND DISCUSSION

Result

The Evidence

The Evidence is a proof in criminal procedural law is something that is important in the criminal court, the evidence provisions that contain outlines and guidelines on ways that are justified by law that proving the guilt charged to the defendant (Priyana, P., Baluqia, S. H., & Darmawan, W., 2021).

The Evidence in the rules of criminal procedural law is a matter that must be considered in the process of examining criminal cases in the court, the evidence that is considered is very important in criminal procedural law because the evidence sought in a criminal case examination is the material of truth needed for the process. Furthermore, which is the goal of the criminal procedural law itself. In the process of finding a truth related to a case, the evidence is one of the most powerful ways used by judges to decide whether or not and decide whether the defense has carried out the act being charged or can also obtain the grounds for making a decision in resolving a case (Rozi, F., 2018).

Several factors affect the evidence that in the activities of investigators in collecting evidence to prove of criminal cases that occurred. Investigators have an important role in the evidentiary process related to determining whether a person is a suspect or not, and also investigators must be master of the tools to carry out a verification and several areas related to evidence such as Forensic Science. So, even though the most important and decisive evidentiary efforts are at the level of case examination in a criminal court, efforts to collect means of evidence already play a role and function at the time of investigation.

Colleration of the Evidence using Forensic Science has been studied by many previous researchers, including: (Santoso, I., 2013), (Medeline, F., Rusmiati, E., & Ramadhani, R. H., 2022), dan (Sinaga, M. I., 2018).

Forensic Photography

Forensic Photography is A Technique of taking photos related to objects, scenes and events to be used in evidence. Forensic photography is used specifically for documenting, analyzing related to the evidence in the court. The most important thing regarding forensic photography is that the images used in the court must be comply with the procedures for the presentation of evidence in accordance with the applicable jurisdiction (Isdiyanto, E, 2016).

Forensic Photography is used to examine the evidence in the form of an image file which is one of the pieces of evidence that can be submitted to a trial. Then, the photo files used must be comply with the standards set by law and can also be used for the intelligence

analysis documenting functions. In checking the authenticity of photo files, several forensic techniques are usually used to prove and examine the photo by using the help of software tools that are commonly used to examine important data and items contained in photos with the help of photographic tools and techniques (Michael Peres, 2007).

The most influential factor related to Forensic Photography is the use of photographic tools and techniques which greatly affect the photos that will be produced. The use of tools capable of producing many quality images includes cameras with 35mm film format, 28-80mm lenses, and the use of external flash. And also the use of other tools such as identification markers that have a good scale is also very important.

Many Forensic Photography has been studied by previous researchers, including: (Firdausi, R. A., Yudhistira, A., & Herkutanto, H., 2018), (Barzah, C. A., 2017), dan (Dhanardhono, T., & Bhima, S. K. L., 2017).

Forensic Toxicology

Forensic Toxicology is one part of forensic science. Saferstein explained that forensic science is "the application of science to law", therefore the description in general, forensic science is an application or use of science in realizing law enforcement and justice. In understanding the meaning and scope of forensic toxicology, it would be better if we already know what toxicology is. Toxicology is a science that studies the work and harmful effects of chemical substances and poisons on the biological mechanisms of an organism (Maramis, M. R., 2015).

Forensic Toxicology explains that the application of toxicology to assist medicolegal investigations in cases of death, poisoning or related to the use of drugs. In these cases, toxicology includes other related sciences such as analytical chemistry, pharmacology, biochemistry and medical chemistry. The main thing in forensic toxicology is not related to the output of legal aspects from investigations using toxicology, but related to technology and techniques in obtaining and interpreting the results obtained such as: understanding the behavior of substances, the causes of poisoning or pollution, then using sampling methods and analytical methods, and interpreting data related to symptoms and effects and impacts that arise as well as other available evidence (Khairunnisa, C., 2023).

The indicators that affect Forensic Toxicology to determine an exposure to a toxic substance can be carried out tissue analysis and body fluids. This aims to measure the content contained in the substance related to the metabolites or regarding enzymes and other biological materials and components as a result of the influence of these toxic substances. Biomarkers are used as marker substances, so this method is more commonly referred to as biomonitoring, and can produce an indication regarding the explanation of the source of exposure and the internal dose of a toxic substance.

Forensic Toxicology has been studied by many previous researchers, including: (Kumean, P. G., Ellias, R., & Soepeno, M. H., 2022) dan (Susdarwono, E. T., 2021).

Digital Forensics

Digital Forensics is A Part of Forensic Science that covers the discovery and investigation of material (data) found on digital devices such as computers, mobile phones, tablets, PDAs, networking devices, storage, and etc. Digital forensics can be summed up as forensic science related to computers or hosts, servers, networks, applications, and digital devices.

Duplicating digital data is a convenience in forensic activities. For example, if an investigator finds a user's computer, the investigator can duplicate the disk from that computer onto a new disk. The investigation process can then continue so that further checks can be

performed on the data on the new disk without worrying about contaminating the original data (Raharjo, B., 2013).

Digital Forensics can be influenced by several factors, including three components, namely: 1) Humans, where humans are the influencing factors in the process of applying digital forensic science to evidence; 2) Equipment, the devices or the tools are important factors to support the identification process using digital forensics, good and sophisticated tools can help to get instructions to explain a case related to evidence; and 3) Rules/Protocols, rules really need in-depth discussion from the side of legal science and other knowledge such as knowledge of information technology (Rachmie, S., 2020).

This digital forensics has been studied by many previous researchers, including: (Andria, A., & Nita, S., 2021), (Syarif, A.M.A., Thalib, H., & Mappaselleng, N.F., 2022), dan (Dasmen, R. N., & Kurniawan, F., 2021).

Relevant Article Reviews

Reviewing relevant articles as a basis for setting research hypotheses by explaining the results of previous studies, explaining the similarities and differences with the research plan, from relevant previous research as shown in table 1 below.

Tabel 1 Hasil Penelitian Terdahulu yang Relevan

No	Author (Tahun)	Hasil Riset Terdahulu	Persamaan Dengan Artikel Ini	Perbedaan Dengan Artikel Ini	H
1	ISDIYANTO, E. (2016)	Forensic Photography and the role of investigators in searching for the Evidence has positive and significant impact on Evidence	Forensic Photography has an effect on the Evidence	The object of research, the use of the Evidence equipment and also the affects on Evidence	H1
2	Firdausi, R. A., Yudhistira, A., & Herkutanto, H. (2018)	Forensic Photography and Physician Analysis are influential in explaining the age of bruises to the evidence of criminal cases	Forensic Photography has an effect on the Evidence	The object of research is the technique of taking photographs that has an effect on Evidence	H1
3	Barzah, C. A. (2017)	Forensic and Laboratory Toxicology have a role in Evidence of suspected criminal acts	Forensic Toxicology has an effect on Evidence	Other components such as analytical chemistry, pharmacology, biochemistry and medical chemistry also influence the Evidence	H2
4	Kumean, P. G., Elias, R., & Soepeno, M. H. (2022).	The special profession of a doctor with the incorporation of Forensic Toxicology has a positive and significant effect on Evidence	Forensic Toxicology has an effect on Evidence	The results of research on technology and techniques in obtaining and interpreting the results that affect the Evidence	H2
5	Andria, A., & Nita, S. (2021)	Digital Forensics and Proper Understanding of Cyber Law have an important and significant impact on Evidence of cyber law attack cases in various applications.	Digital Forensics influences the Evidence	Humans and equipment affect evidence related to digital forensics	H3

6	Dasmen, R. N., & Kurniawan, F. (2021)	Digital Forensics in the use of social media has an effect on Evidence of cyberbullying cases	Digital Forensics has an effect on the Evidence	Influential objects related to perpetrators/persons for proof using digital forensics in criminal cases	H3
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Discussion

Based on the theoretical study, the discussion of this literature review article is to review relevant articles, analyze the influence between variables and conceptually think about a research plan:

The Effect of Forensic Photography on Evidence.

Forensic Photography is part of Forensic Science which has a function to search for the evidence and one of them is through the method of photography by police investigators. Through a medium, incidents of crime, accidents, fires, etc., including physical evidence related to these events can be recorded, the resulting photos which are permanent records of these events help reveal facts related to proving a case. in the criminal justice system.

The concept of Forensic Photography is a depiction of reality that intends to convey important things, make a comment or review that will make a evidence can be proven in real terms.

Forensic Photography has an effect on Evidence, if Forensic Photography is well perceived then Evidence will be well perceived and vice versa. Whereas the identification process in using Photography for Law Enforcement in order to understand its use includes shooting techniques, identification shooting, various types of portraits, making copies/reproductions, making photos of evidence, shooting at the scene of the incident, footprints, footprints on shoes dusty objects, traces of footprints, drops of blood, bullets and cartridges, and fragments and other small objects related to the cases being investigated for the evidence process which can be used in court.

The factors that influence Forensic Photography are the use of tools, the selection of photographic techniques and experienced users, of course, greatly affect the resulting photos. Selection of the tool to be used where the tool is able to talk a lot and produce quality images, you must use a camera with 35mm film format, 28-80mm lens, and use an external flash. Apart from that, other equipment such as scaled identification markers are also needed in this process.

To increase evidence by paying attention to forensic photography, what law enforcement must do is increase and maintain the supply of tools that will be used for forensic photography and then increase the quality of human resources to be responsible for shooting execution activities, where these 2 components affect the technique of taking photo evidence to be used for evidence in court.

Forensic Photography has an effect on Evidence, this is in line with research conducted by: (Firdausi, R. A., Yudhistira, A., & Herkutanto, H., 2018), (Barzah, C. A., 2017), dan (Dhanardhono, T., & Bhima, S. K. L., 2017).

The Effect of Forensic Toxicology on Evidence.

Forensic Toxicology is an applied science that is supported by various other basic science fields in practice, for example in analytical chemistry, biochemistry, instrumentation chemistry, pharmacology-toxicology, pharmacokinetics, and biotransformation.

The concept of Forensic Toxicology in conducting the evidence is to describe cases that occur with forensic toxicology examinations, covering three major groups, such as 1) Deaths caused by poisoning, for example, such as sudden death, death in prison, death that occurred during a fire, and medical deaths caused by side effects of drugs or malpractice; 2) Fatal or

non-fatal accidents where this can endanger the safety of one's own life or that of others, which are generally caused by the influence of drugs, alcohol or narcotics; 3) Drug abuse and cases related to pharmaceutical forensics.

A forensic toxicologist is highly concerned about the circumstances of an investigation, especially if records of physical symptoms are found, and there is any evidence found at the scene of the crime that may reduce the scale of the search, for example such as evidence such as vials of drugs, powder, trace residue and any chemical substances found. With this information and the samples to be examined, the forensic toxicologist must be able to decide what toxic compounds are present in these samples and in what concentration and the effects that these toxic substances can have on a person (victim).

Factors that influence Forensic Toxicology in evidence, namely in determining an exposure to a toxic substance can be analyzed tissue and body fluids. This is done with the aim of being able to measure how much the substance contains, as well as its metabolites, as well as enzymes and other substances that can be a result of the influence of these toxic substances. Biomarkers are used as marker substances, so this method is more commonly referred to as biomonitoring, and can produce an indication regarding the explanation of the source of exposure and the internal dose of a toxic substance. Monitoring or assessment of substances in the environment and their biomarkers. This monitoring method must be carried out using toxicological understanding of the rules and is an important finding in toxicological investigations.

Forensic Toxicology has a role in Evidence, this is in line with research conducted by: (Kumean, P. G., Ellias, R., & Soepeno, M. H., 2022) and (Susdarwono, E. T., 2021).

The Effects of Digital Forensics on Evidence.

Digital forensics is a branch of computer science that focuses on developing evidence relating to digital files for use in criminal trials. The evidence generated through digital forensics will be linked to computer documents, e-mails, text, digital photos, or other digital recordings related to criminal cases.

The principles in Digital Forensics are First, which refers to the results produced, namely forensic imaging or physical duplication of each sector which is carried out using the latest disk to file method. The second refers to image files produced by photography using cameras or cellphones that use digital file storage systems, digital image files will come from the results of the process of capturing objects using digital camera equipment.

Digital Forensics has an effect on Evidence, Digital Forensics is well perceived then Evidence will also be well perceived, and vice versa. This explains how important digital forensic techniques are used to check the authenticity of photo files. This is also a part of forensic photography techniques, commonly used to examine and examine evidence or evidence in the form of an image file which will be one of the pieces of evidence that can be submitted or submitted to a court of law, but if the photo file complies with the standards set by existing regulations, in addition to that, the image can be used for documentation, intelligence analysis.

Factors that influence Digital Forensics related to the success of obtaining digital evidence are modification activities to the conditions of the application and the device used.

Digital Forensics has a role in conducting the Evidence, this is in line with researches conducted by: (Andria, A., & Nita, S., 2021), (Syarif, A. M. A., Thalib, H., & Mappaselleng, N. F., 2022), dan (Dasmen, R. N., & Kurniawan, F., 2021).

Conceptual Framework

Based on the formulation of the problem, discussion and relevant research, the conceptual framework of this article is processed as shown in Figure 1 below.

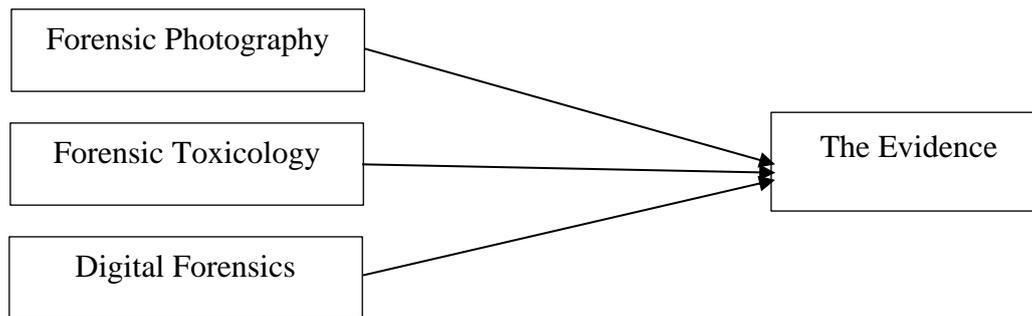


Figure 1. Conceptual Framework

Based on the conceptual framework above, then: Forensic Photography, Forensic Toxicology, and Digital Forensics have an effect on Evidence. Apart from the three exogenous variables that influence Evidence, there are many other variables, including:

- 1) Forensic Psychology: (Muluk, H., 2013), (Syam, DR, Baskoro, B. D., & Sukinta, S., 2017), and (Sulmustakim, A., 2021).
- 2) Forensic Medicine: (Kalangit, A., 2013), (Pambudi, L. A. R., & Purwanto, H., 2020), and (Pangemanan, A. A., Siwu, J., & Mallo, N. T., 2018).

CONCLUSION

Based on the objectives, results and discussion, the conclusions of this article are to formulate hypotheses for further research, namely as follows: 1) Forensic photography has an effect on evidence; 2) Forensic Toxicology has an effect on Evidence; and 3) Digital Forensics has an effect on Evidence.

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