THE SIGNIFICANCE OF EFFICIENT MURDER CRIME SCENE PROCESSING

by

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DECLARATION

I hereby declare that “The significance of efficient murder crime scene processing”, submitted in accordance with the requirements for the degree of Magister Technologiae in the subject Forensic Investigation, is my own work and has not previously been submitted to another institution of higher education. All sources used in this research paper have been appropriately cited or quoted, and are indicated and acknowledged in the comprehensive list of references.

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ABSTRACT

This study sought to explore the significance of efficient murder crime scene processing. Data were collected through semi-structured interviews conducted with investigators who investigate murder cases in the Nyanga South African Police Service (SAPS) cluster in the Western Cape, to stimulate knowledge of the significance of efficient murder scene processing. A literature study relating to aspects of crime scene management and crime scene processing was conducted. From the results of this research, it appears that participants did realise the significance of efficient murder scene processing. It is, however, apparent that they experienced challenges and shortcomings with regard to efficiently processing murder scenes. Reasons for this are inexperienced investigators, overload of murder scenes to investigate, lack of human resources, and lack of cooperation between investigators and crime scene experts. The study makes recommendations that could assist the Nyanga SAPS cluster in improving the processing of murder scenes.

Key terms

Crime scene; crime scene management; crime scene processing; crime scene investigation; murder; physical evidence; Local Criminal Record Centre; Forensic Science Laboratory.

LIST OF ABBREVIATIONS

CR & CSM	Criminal Records and Crime Scene Management
CSM	Crime Scene Management
DNA	Deoxyribonucleic Acid
FCS	Family Violence, Child Protection and Sexual Offences unit
FSL	Forensic Science Laboratory
LCRC	Local Criminal Record Centre
PPE	Personal Protective Equipment
LCV	Lueco Crystal Violet
SAPS	South African Police Service
UV	Ultra Violet

TABLE OF CONTENTS

CHAPTER 1 GENERAL ORIENTATION

1.1 INTRODUCTION

This study explored the significance of crime scene crime processing in murder investigations at the Nyanga South African Police Service (SAPS) Cluster. Marais (1992:8) describes the crime scene as the main source of physical evidence, which qualifies crime scene processing as the crux of all crime scene investigations. Pepper (2005:13) reckons that it is of paramount importance to comprehensively and conscientiously examine and record the crime scene. Pepper further emphasises that all crime scene investigators only have one opportunity to recover evidence at the crime scene.

Horswell (2004:108) states that the identification, recording and retrieval of probable evidentiary material are practised globally by persons in diverse circumstances who possess a variety of qualifications and who have completed a variety of education and training programmes. Bowen (2010:58) believes that communication is critical for assuring that everyone identifies his/her role in processing the scene, and Downs and Swienton (2012:266) assert that modern detectives should have an understanding of crime scene processing, which involves identifying, securing/protecting, documenting, collecting and preserving all items of potential probative value.

Crime scene processing during the investigation of murder is of utmost importance. The motive is to recognise, gather, document, package and dispatch physical evidence for analysis, with the aim to bring perpetrators before a court of law and to successfully prosecute them. Furthermore, comprehensive crime scene processing allows a clear picture to be sketched for the presiding judge or magistrate, which will enable him/her to completely understand what the scene of murder looked like at the time of the arrival of investigators.

1.2 BACKGROUND TO THE STUDY

The Criminal Records and Crime Scene Management (CR & CSM) unit, which was at first called the Criminal Records Centre, was founded in April 1925. The CR & CSM unit resorts under the Forensic Services Division of the South African Police Service (SAPS). The CR & CSM unit is responsible for information management of criminal records and scientific support in the investigation of crime. According to Kempen (2014:11), the importance of CR & CSM is to render support services to investigators in the investigation of crime, such

as murder, which results in crime scene experts reporting at crime scenes sooner in order to secure evidence. The primary responsibility of the Crime Scene Management (CSM) section includes crime scene processing, for example, processing of murder crime scenes. Crime scene processing plays a major role in assisting detectives to process crime scenes through photography, videography, evidence processing and evidence collection. The CSM section ensures that the crime scene is processed and managed efficiently in order to eliminate contamination, to document, identify and package exhibits, and to conduct analyses according to prescribed policies and procedures (Kempen, 2014:11). Crime scene processing is guided by provisions set out in SAPS policy documents and standard operating procedures. The Policy Framework for Local Criminal Records Centres (SAPS, 2003) specifies the business of the Local Criminal Record Centres (LCRCs) concerning fingerprint and photographic activities as stated in Policy 5 of this policy framework. SAPS National Instruction 1 of 2015 (South Africa 2015) stipulates the conduct required during crime scene management, and criminal investigation is guided by the Criminal Procedure Act.

1.3 PROBLEM STATEMENT

Walliman (2011:29) view the research problem as the heart of the research project. It is developed by recognising a question that demands an answer, a need that necessitates a solution, or a riddle that seeks a solution. According to Welman, Kruger and Mitchell (2005:13), the research problem involves narrowing down one's general concern in a research topic in order to focus on a particular research problem that is small enough to be investigated.

Gilbert (2007:238) acknowledges that murder is the most heinous crime in the mind of the average individual and emphasises the importance of training police officials who investigate murders. Murderers who are not brought before court because of lack of evidence terrorise the community and might re-offend, causing the community to lose faith in the justice system and police. Joubert (2001b:43) states that incomplete investigations of any crime or case docket lead to the prosecutor not being willing to prosecute or to guilty persons being found not guilty.

Gilbert (2007:79) is of the opinion that all crime scenes contain physical evidence; thus, the investigator concentrates on the search for physical evidence. Gilbert acknowledges the fact that processing the crime scene is one of the most important stages of the investigation; thus,

the crime scene needs to be processed efficiently in order for the evidence to have value. Downs and Swienton (2012:266-267) emphasise the involvement of investigators in crime scene processing and are of the opinion that, in order to utilise the forensic value of physical evidence effectively, the modern investigator should have an understanding of crime scene processing, which includes identifying, securing/protecting, documenting, collecting and preserving all items of potential probative value. Lochner and Zinn (2015:58) state that it is a distinct advantage to a wise and enterprising investigator to know who the experts are and how they can assist in the investigation. Once the crime scene is considered secure and safe, investigators (crime scene specialists, forensics experts and investigators) begin the process of documenting and collecting those items they deem most likely to be probative. The murder investigation of Inge Lotz[1] is an example of a murder scene that was insufficiently processed; therefore, the physical evidence collected tended to be of no evidential value and the suspect was acquitted.

According to the annual crime statistics (SAPS, 2012a:5) and the SAPS annual report for 2011/2012 (SAPS, 2012c:5), 15 609 murders were reported in South Africa during this period. In 2010/2011, 15 940 murders were reported in South Africa (SAPS, 2011a:3). The SAPS annual report for 2013/2014 (South African Police Service, 2014a:13) shows that the number of murders committed during this period totalled 17 068. According to the SAPS annual report for 2011/2012 (SAPS, 2012c:98), 4 583 murderers were convicted during that period and the SAPS annual report for 2010/2011 (SAPS, 2011b:98) reports that 4 350 murderers convicted during that period. Of the 10 police precincts with the highest reported murder rate, six are in the Western Cape. A survey published by the South African Institute of Race Relations claims that Cape Town has the highest murder rate in South Africa,

[1] Inge Lotz was brutally murdered in her flat on 16 March 2005. During crime scene processing fingerprints and shoe prints was collected as evidence. A fingerprint lifted from the cover of the rented out DVD was found to be identical with the left index fingerprint of Fred van der Vyver who was Lotz's boyfriend at the time. Furthermore a photograph was taken of blood found on the floor in Lotz's bathroom. During a search in Van der Vyver's office, vehicle and apartment, an ornament hammer and a pair shoes were collected. Evidence in dispute by Van der Vyver's three hired experts found that the fingerprint was lifted from a drinking glass and not from a DVD cover. The court accepted these experts' version, leading to fingerprint evidence to be rendered null and void. A blooded shoe print impression photographed at the crime scene was compared to the shoe prints collected from Van der Vyver by the shoe print analyst and individuality marks were found to correspond. These marks were disputed and Van der Vyver was acquitted and he laid a civil claim against the Minister of Police for malicious prosecution (Minister of Police v Van der Vyver, 2013).

followed by Nelson Mandela Bay, Durban and Johannesburg (South Africa's murder capital cities, 2012).

This study focused on murder investigations in Nyanga, Western Cape, that were reported between January 2012 and June 2012. During this period, 41 (35%) murder cases from a total of 116 reported murder cases were sent to court and 33 (28%) of the 116 reported cases were rendered undetected (SAPS, 2012d). The Nyanga policing area consists of 15 informal settlements. The LCRC administration system (SAPS, 2012b) revealed that, from January 2012 to June 2012, only 37 (31%) of 116 murder crime scenes reported were processed for physical evidence collection, 46 (39%) had photos that were taken at the mortuary, and the remaining cases were not received by the LCRC for processing. The fewer crime scenes processed, the smaller the chance of presentation of physical evidence in court in order to crack a criminal case or convict the perpetrator.

Optimal utilisation of crime scene experts is highly encouraged, although the first members at the crime scene are primarily uniformed police officers attached to the Visible Policing Division. Detectives are also summoned to each murder scene, and since detectives carry the investigation further and keep all reports concerning the criminal case until the case is sent for trial, it is important for the detective to ensure that all murder scenes are attended by the CR & CSM (LCRC) member.

Although the body of the deceased at the mortuary is treated as a crime scene, it loses forensic evidence when it has been moved and the court of law only views the primary crime scene through crime scene photos. However, photographs assist the court to ascertain evidence such as entrance and exit wounds and extent of the injuries. Based on the information and observations at the scene of the crime, the detective will be able to share the information with the CR & CSM member at the scene, so that no stone is left unturned during crime scene processing.

If CR & CSM is not utilised optimally, collection of forensic evidence, such as premier residue, blood spatter analysis, deoxyribonucleic acid (DNA) analysis and swabbing of murder weapons, will never be done, which is why it is crucial for CSM members to be summoned to every murder crime scene. Manamela, Smith and Mokwena (cited by Zinn & Dintwe, 2015:155) point out that the underutilisation of experts at the scene of incident severely hampers any prospects of an arrest being made, especially when the perpetrator of the incident is unknown. It is clearly detailed in the South African Police code of conduct

that, in order to achieve a safe and secure environment, all available resources must be used to investigate criminal conduct which has endangered the safety of the community and to bring the perpetrators thereof to justice.

1.4 AIM OF THE RESEARCH

Braun and Clarke (2013:53) state that research aims specify what the research aims to achieve. Gray (2009:52) states that research aims describe the purpose of the research.

The aim of this study was to explore the significance of efficient crime scene processing during murder investigations.

1.5 PURPOSE OF THE RESEARCH

According to Walliman (2011:15), the research purpose is about obtaining knowledge and developing understanding, collecting truths and interpreting them to establish a picture of the world around and even within us. Babbie (2007:19), on the other hand, asserts that social research has the following purposes: exploration, description and explanation.

The purpose of this research was:

- To explore, identify and describe correct processes that should be followed during crime scene processing in murder investigations to emphasise the significance of efficient crime scene processing.
- To efficiently understand efficient crime scene processing in murder investigations by exploring existing practices, together with national and international literature, and to make this information, in the form of findings, available to investigation officers and crime scene processing investigators.
- To reach recommendations for best practices to be followed during murder crime scene investigations based on the results of the data scrutiny that will address the research problem and could enhance investigation skills of murder detectives.
- To empower forensic investigators and researchers with enhanced knowledge of efficient crime scene processing, and to enhance the quality of physical evidence collected at murder scenes.

1.6 RESEARCH QUESTION

Wagner, Kawulich and Garner (2012:18) state that research questions identify what the researcher wants to study and help the researcher to narrow the research down to specific details that must be included. According to Gray (2009:55), research questions must be researchable and explicit as they help to define an investigation, regardless of whether its purpose is to discover, explore, explain or compare, establish boundaries for the research, and point out to the literature that is relevant to the study.

The researcher formulated the following research question to lead the research study:

What is the significance of efficient crime scene processing in murder investigation?

1.7 KEY THEORETICAL CONCEPTS

Fox and Bayat (2007:24) describe concepts as abstractions representing an object, a property or a particular phenomenon. They are the building blocks of all theoretical models. The following concepts are central to this study:

1.7.1 Crime scene

A crime scene is the physical area in which a crime is alleged to have happened and in which evidence of the crime is thought to be located. Significantly, numerous crime scenes may be involved in any particular criminal investigation, especially when a mobile offender continues to violate the law (Schmalleger, 2005:237).

1.7.2 Crime scene processing

Crime scene processing is the process of documenting, collecting and preserving evidence for analysis, within standard operating procedures and protocols. Documentation occurs with the use of photography and videography to capture a crime scene (Bowen, 2010:58).

1.7.3 Murder

Murder is the unlawful and intentional causing of the death of another person (Joubert, 2013:104).

1.7.4 Physical evidence

According to Travers (2005:173), physical evidence may be defined as articles and material which are found in connection with an investigation and which help in establishing the identity of the perpetrator or the conditions under which the crime was committed, or which in general assist in the discovery of the facts.

1.8 VALUE OF THE RESEARCH

Denscombe (2010:24) is of the opinion that research can be justified as worthwhile to the extent that it extends the boundaries of knowledge by contributing something to existing theories, ideas or information in some way, however modest. Neuman and Robson (2012:11) view research as being used to advance understanding of the fundamental nature of social life and knowledge, and to apply study results to solve specific, immediate problems or issues. According to Leedy and Ormrod (2013:46), it is very important for the researcher to describe the importance of the study.

The results of this study can have the following benefits:

- The research could empower detectives who investigate murder cases with an improved understanding of the significance of efficient crime scene processing.
- The research could raise awareness concerning the value of efficient crime scene processing among SAPS investigators.
- South African citizens could benefit from this study and its results, as this study could contribute towards an increase in arrests and convictions of murder suspects.
- This research will be made available to the academic community. The generated knowledge could be used in related studies and as a source of information to improve investigation knowledge. Furthermore, it could be included in learning material to improve the understanding when dealing with the processing of murder scenes.

1.9 RESEARCH DESIGN

According to Wagner et al. (2012:21), “in social research the design articulates how you are going to conduct your research, for example, which methodology is suitable, methods of data gathering and technique for analysing the facts.” Walliman (2011:9) is of the opinion

that “research design has a range of research methods that are commonly used to collect and analyse the type of data that is generated by the investigations.”

The researcher performed empirical research by means of conducting semi-structured interviews to obtain the real-life experiences of participants with regard to the processing of a murder scene. An interview schedule guided the researcher during the interviews. Bouma, Ling and Wilkinson (2012:17) acknowledge that empirical research can be qualitative and only seeks to answer those questions that can be answered by reference to sensory data.

1.10 RESEARCH APPROACH

Bouma et al. (2012:103) state that qualitative research is intended to gather a great deal of information on a small number of individuals or groups with specific characteristics, based on previous observations and research on a particular phenomenon that necessitate a deeper exploration of the issue. Qualitative methods are especially useful for exploring a phenomenon, for understanding it, and for translating that understanding into theory.

The researcher followed a qualitative research approach to explore the significance of efficient crime scene processing in the investigation of murder. The qualitative research approach enabled the researcher to explore, interpret and build theory through conducting interviews and a comprehensive review of the literature.

1.11 TARGET POPULATION AND SAMPLING

According to Babbie (2010:116), the population for a study is that crowd (usually of people) about whom the researcher wants to draw conclusions. Welman et al. (2005:52) view a population as the study entity, consisting of groups, organisations, human products and events, or the conditions to which they are exposed. The ideal population for this research would have been all the investigators in the SAPS who investigate murder and are thus required to activate the CR & CSM (LCRC) unit, who will conduct efficient crime scene processing that will assist the detectives during investigations to collaborate facts (physical evidence) with statements collected from witnesses, expert witnesses, pathologists and even suspects’ confessions. It was, however, impractical to consult with the sum total of investigators in the SAPS who investigate murder; therefore, the researcher made use of a target population.

The target population consisted of investigators who investigate murder cases in the Nyanga SAPS cluster in the Western Cape. The Nyanga cluster consists of seven police stations, namely, Manenberg, Athlone, Philippi, Philippi-East, Gugulethu, Nyanga and Lansdowne areas. The total number of investigators performing duties in the Nyanga cluster who investigate murder cases totals 28. The Nyanga cluster has a high murder rate as indicated in section 1.3; therefore, investigators in this cluster have vast exposure to and experience of murder investigations.

Kumar (2011:193) describes sampling as the process of selecting a few (a sample) from a bigger group (the target population) to become the basis for estimating the prevalence of an unknown piece of information, situation or outcome regarding the bigger group. In other words, a sample is a subgroup of the population in which the researcher is interested. Non-probability sampling in the form of purposive sampling was used in this study. Bouma et al. (2012:140) view purposive sampling as appropriate for qualitative approaches in which the intent is to examine a typical case in order to understand it more comprehensively. According to Bryman (cited by Ritchie, Lewis, Elam, Tennant & Rahim, 2014:113), the sample units in purposive sampling are chosen because they have particular features or characteristics which will enable detailed exploration and understanding of the central themes and questions which the researcher wishes to study.

The sample of this study included 15 investigators attached to Nyanga, Manenberg, Gugulethu, Philippi, Philippi-East, Lansdowne and Athlone police stations in the Nyanga policing cluster. These investigators are experienced, trained and active in the investigation of murder and have been exposed to murder crimes scenes. Data were collected until saturation was achieved.

1.12 DATA COLLECTION

According to Walliman (2011:65), “data is another word for bits of information, research uses data as the raw material in order to come to conclusions about some issues”. Wagner et al. (2012:132) express “qualitative research studies generally depend on three basic data-gathering techniques: observations; interviews and document or artefact analyses” Bouma et al. (2012:191) put emphasis on the fact that the data collection for each unit of analysis should be recorded separately.

The researcher collected data by means of a literature review and by conducting semi-structured interviews.

1.12.1 Literature review

A literature review is a written document that presents a logically debated case based on a complete understanding of the current state of knowledge about a topic of study, which institutes an undoubted thesis to answer the study's question (Machi & McEvoy, 2012:4).

According to Ridley (2012:3), a literature review can be defined as the selection of accessible documents on the topic, containing information, concepts, data and evidence written from a certain standpoint to fulfil certain aims or express certain views on the nature of the topic and how it is to be investigated, as well as the effective evaluation of these documents in relation to the research being proposed.

The researcher consulted national and international literature to explore best practices regarding crime scene processing, in particular the processing of a murder scene, to obtain sufficient physical evidence. The researcher visited public and academic libraries in the Western Cape to obtain and study the necessary literature to become more familiarised with the topic. In addition, the researcher consulted academic journals, SAPS documents, websites (especially related to crime scene processing) and other national and international sources.

1.12.2 Semi-structured interviews

According to Blaxter, Hughes and Tight (2001:172), interviewing involves questioning or deliberating issues with people. These authors submit that interviews can be a very useful technique for collecting data that would probably not be accessible using techniques such as observation or questioning. Leedy and Ormrod (2013:153) similarly view interviews as a method that can yield a great deal of useful information.

The researcher conducted semi-structured interviews with 15 investigators in the Nyanga cluster who attend to murder crime scenes and investigate murders, in an effort to explore their understanding of the significance of efficient crime scene processing.

1.13 DATA ANALYSIS

Leedy and Ormrod (2013:146) view the crucial task of data analysis as identifying common themes in people's explanation of their experience. According to Babbie (2010:117), once the collected data are in an appropriate form, the researcher is ready to interpret them to draw conclusions that reflect the interests, ideas and theories that initiated the inquiry. Bouma et al. (2012:23) view data as empirical facts, which are scores regarding a number of questions, written observations and records of the real state of some measurable aspects of the universe.

The data collected through the interviews were scrutinised in conjunction with all the information obtained through the literature reviewed. Brynard, Hanekom and Brynard (2014:68) explain that the underlying idea is that the researcher should not just accept the points of view of other authors as being correct and valid, but should question, test, interpret and rephrase the viewpoints of others.

The researcher used the data analysis spiral method as described by Creswell (2013:182), which enabled her to manage data accordingly. The following steps of data analysis were followed:

- Step 1: Organise and prepare (arranging and assembling the data into different types depending on the sources of information).
- Step 2: Read through all the data (writing transcripts in margins or beginning to record general views about data).
- Step 3: Code the data (taking manuscript data, segmenting sentences or paragraphs into groups and labelling those categories with a term).
- Step 4: Use coding to create a small number of themes or categories.
- Step 5: Discuss themes in detail.
- Step 6: Compare the outcomes with information gathered from literature or existing theories to confirm past information or formulate questions that need to be asked.

1.14 TRUSTWORTHINESS OF THE STUDY

According to Guba and Lincoln (cited by Kumar, 2011:184), there are four pointers that reflect validity and reliability in qualitative research, namely, trustworthiness, transferability, dependability and confirm ability. According to Trochim and Donnelly (cited by Kumar, 2011:185), these four indicators involve the following in qualitative research:

- **Credibility:** Credibility involves establishing that the outcomes of qualitative research are credible or believable from the standpoint of the research participant. It is believed that the respondents are the best judge to determine whether or not the research findings reflect their opinions and feelings accurately. Credibility is thus judged by the magnitude of respondent concordance, whereby one takes the outcomes to those who took part in the research for validation and approval. The higher the outcome of these, the higher the validity of the study. In order to ensure credibility in the study, respondents were granted access to the final report to validate the accuracy of their feelings and opinions.

- **Transferability:** The degree to which the results can be generalised or transferred to similar contexts or settings is called transferability. To achieve transferability, the researcher comprehensively described the research process followed for others to replicate. The researcher also used a detailed narrative to communicate the research findings by indicating in detail the participants' responses to the interview questions.

- **Dependability:** Dependability is concerned with whether one would acquire the same outcomes if one could observe the same thing twice. To ensure dependability, it is once again necessary to keep extensive and detailed record of the process for others to follow. Participants' answers to interview questions were manually recorded to guarantee a comprehensive description of events.

- **Confirmability:** The degree to which the outcomes can be confirmed by others is referred to as confirmability. To achieve confirmability, researchers should be able to follow the procedure in an identical manner for the results to be compared. To guarantee confirmability in this study, the researcher retained meticulous records of the research methodology followed to determine whether the evaluation and analysis of the findings, the recommendations and the conclusions made could be supported by the analysis. Manual records of the interviews were stored for examination by other researchers to authenticate the results of the study.

1.15 ETHICAL CONSIDERATIONS

According to Gray (2014:68), research ethics means conducting research in a way that is not about merely adopting the most appropriate research methodology, but conducting research in an accountable and ethically defensible way.

The researcher conducted the research within the ethical guidelines discussed below.

1.15.1 Informed consent

Webster, Lewis and Brown (2014:87) view the essence of informed consent as meaning that people should be given sufficient information to enable them to make a decision about whether or not to take part in a study. These authors are of the opinion that the key messages to communicate to participants encompass:

- the purpose and aims of the research;
- the organisation or individual conducting the study;
- that participating is voluntary and can be withdrawn at any time;
- what participating will include; and
- whether and how data will be kept confidential and anonymity will be maintained.

Interviews were conducted only with voluntary participants who gave consent after the nature and purpose of the research had been explained. Participants were informed explicitly what their participation would involve, and that they would be able to withdraw at any time from the study without any explanation.

1.15.2 Confidentiality and Anonymity

Confidentiality means not revealing who has taken part and not reporting what they said in ways that could identify them or be attributed to them (Webster et al., 2014:96).

Interviews took place at the participants' offices and were conducted privately and individually. The responses of participants were preserved privately and were solely used for the purposes of this study. Matthews and Ross (2010:78) confirm that participants should be guaranteed that they will not be identified in the research and that their input to the research will be confidential.

In order to guarantee protection of identities, interview schedules did not bear participants' names and participants' identities were never mentioned in the research report.

The researcher conducted her research according to the University of South Africa's (2007:15) policy on research ethics, which states that researchers should safeguard the dignity of participants and respect their privacy and confidentiality. No information received

from respondents was reported in such a way that the respondent could be identified and no name could be linked to any response as the interview documents did not bear any names.

1.16 SUMMARY

This chapter offered the general orientation of this study as well as the research methodological parameters followed. The research problem and the corresponding aim of this study, namely, to explore the significance of efficient crime scene processing during murder investigations, were contextualised and data collection and analysis were described. This chapter concluded with measures incorporated to ensure trustworthiness in this study as well as an illustration of the ethical aspects abided by in this study.

Chapter 2 provides a literature review about crime scene management and crime scene processing. The relevant findings from the interviews are incorporated within the relevant literature sections.

CHAPTER 2 CRIME SCENE MANAGEMENT AND PROCESSING

2.1 INTRODUCTION

According to Thomas (2007:6), crime scene investigation is a systematic process that involves identifying, documenting, collecting, preserving and evaluating information and evidence at a crime scene to determine what happened, how it happened, why it happened and who or what was responsible. Crime scene management and processing are thus a significant part of a criminal investigation.

Criminal investigation is the process of discovering, gathering, preparing, identifying and presenting evidence to determine what happened and who is responsible when crime occurs (Schmalleger, 2005:237). According to Gilbert (2007:33), the aims of an investigation are to analyse logically a multitude of facts and determine how they interrelate to the investigative purpose. Gilbert (2007:49) states that other aims of an investigation are to identify, locate and arrest perpetrators, obtain evidence, and recover stolen property in a thorough legal manner designed to ensure the greatest probability of justice. Becker (2009:11) identifies the aims as allocating and identifying suspects, recording and processing evidence while observing all constitutional considerations, arresting the perpetrator, recovering property, preparing for trial, and convicting the defendant by testifying and assisting in the presentation of legally obtained evidence and statements.

Gardner and Bevel (2009:7) acknowledge that investigation includes subjective aspects such as testimonial evidence, but it is clear that physical evidence and the context of the crime scene distinctly shoulder responsibility in solving crime. These authors mention testimonial evidence and the probability of justice, and again mention that solving crime occurs in relation to a multitude of facts and determining how they relate to the investigation, as well as the meaning of what happened and who is responsible.

Murder investigation starts when law enforcements agents receive a complaint about a discovered dead body. The law enforcement officer creates the boundaries of the crime scene by cordoning off the scene so that evidence is protected, keeps records of all people coming into the scene and mentions in the log which roles they are going to play. A route to enter the crime scene should be determined, which should be least likely to disturb evidence. Fingerprints and shoeprints should be taken so that people who had legal access to the crime

scene are eliminated. Exhibits can be removed only after the crime scene has been documented and photographed.

This chapter focuses on crime scene management and processing. Furthermore, this chapter incorporates and displays the findings of the interviews conducted with investigators who investigate murder cases in the Nyanga SAPS cluster in the Western Cape. The results of the interviews illustrate these investigators' insights, outlooks and proficiencies of crime scene management and processing of murder scenes. The questions posed to participants are outlined in this chapter, followed by their replies to the questions. The participants' responses are consequently interpreted.

Crime scene management and its subcategories follow for discussion.

2.2 CRIME SCENE MANAGEMENT

According to SAPS National Instruction 1 of 2015 (SAPS, 2015) crime scene management involves the following process of planning and implementation of measures to:

(a) take control and secure the crime scene;
(b) ensure the integrity and the originality of evidence and exhibits;
(c) investigate and process the crime scene thoroughly and undisturbed;
(d) coordinate and maximise the collection of exhibits;
(e) utilise the investigation support resources optimally;
(f) record facts and events properly; and
(g) ensure that the crime scene remains under police protection for the period determined by the crime scene manager.

The participants were asked the following question: *What is your understanding of crime scene management?* The aim of this question was to explore to what extent participants understood the concept of crime scene management.

- Eleven participants explained crime scene management as the protection and securing of physical evidence at the crime scene and participants were of the view that the responsibility of documenting the crime scene are the sole responsibility of crime scene experts. Participants were furthermore of the opinion that, besides the protection of the crime scene, the first responder's duty is also to attend to injured persons.

- The remaining four participants did not have an understanding of crime scene management.

In contrast to literature on the explanation of crime scene management, the feedback obtained from the participants clearly indicates that the participants did not have a comprehensive understanding of what crime scene management entailed. Participants' understanding of crime scene management was rather limited to the protection, securing and packaging of physical evidence, as well as attending to injured persons. It appears that the underutilisation of crime scene experts to process murder scenes is primarily a result of the lack of a comprehensive understanding of all the aspects of crime scene management. The underutilisation of crime scene experts in the investigation of murder cases could also be the result of investigators' lack of awareness of the value of utilising all investigation support resources optimally.

2.2.1 Phases of Managing a Crime Scene

SAPS National Instruction 1 of 2015 (South African Police Service, 2015a) points out the objectives of crime scene management as ensuring that:

- the crime scene will be secured;
- the integrity and originality of evidence and exhibits are consequently guaranteed;
- detailed and undisturbed investigation can take place on the crime scene;
- the coordinated and maximised collection of exhibits, leads and evidence is attained;
- victims and suspects are handled in accordance with organisational procedures;
- proper recording of facts and events take place; and
- the crime scene remains under the control of the SAPS for the period determined by the crime scene manager to ensure that the investigation is done thoroughly and safety on the scene is ensured.

As stipulated in SAPS National Instruction 2 of 2005 (SAPS, 2005) there are 10 phases for effectively managing a crime scene, namely: (1) reporting and activation; (2) responding; (3) controlling; (4) hand-over; (5) planning; (6) investigation and processing; (7) debriefing; (8) restoring; (9) releasing; and (10) evaluation. SAPS National Instruction 1 of 2015 mentions the same phases.

Fish, Miller and Braswell (2011:33) mention that the Federal Bureau of Investigation follows 12 steps to ensure that the integrity of the physical evidence at a crime scene is not compromised, namely: prepare, approach, secure and protect, initiate initial survey, evaluate physical evidence possibilities, prepare narrative descriptions, depict scene photographically, prepare diagrams and sketches of scene, conduct a comprehensive search, record and collect physical evidence, conduct final survey, and release scene.

Benson, Jones and Horne (cited by Zinn & Dintwe, 2015:21) explain the investigation process as reporting of the crime or incident and preliminary investigation phase (processing the crime scene and opening a case docket, taking statements from complainants, victims, witness, suspects, information and evidence). Marais and Van Rooyen (1993:28) divide crime scene investigation into three phases, which are: a preliminary investigation phase, a search phase, and a collection, handling, packaging and storage phase. Marais and Van Rooyen further explain that the preliminary investigation phase consists of protection and guarding of the scene, including the protection of people, property and physical evidence, so taking charge of the crime scene is highly emphasised. Fisher and Fisher (2012:37) state the integrity of the crime scene is of utmost importance; therefore, these authors recommend use of vehicles, boards or even furniture if the crime scene tape does not keep onlookers, officers, supervisors, press, family members and so on outside parameters of the crime scene.

Platt (2003:12) emphasises that it is a priority that the first responder should preserve life, detain and remove suspects, and control the crime scene. The first member on the scene must also establish a command centre for administrative functions and communication, pinpoint potential witnesses, and gather information on suspects. These actions must be continued until the first member is able to hand the scene over to the crime scene manager.

A crime scene manager, according to SAPS National Instruction 2 of 2005 (SAPS, 2005a), is a specifically trained member of the appropriate investigation unit who manages the crime scene team on the crime scene. The crime scene manager will be a senior ranking member of the Serious and Violent Crimes (SVC) unit, or the Family Violence, Child Protection and Sexual Offences (FCS) unit, depending on the nature of the crime.

The participants were asked the following question: *Are you familiar with the phases of managing a crime scene?* The aim of this question was to discover to what extent participants were acquainted with the phases of managing a crime scene.

- Eight of the 15 participants correctly identified the crime scene management phases and understood how each phase assisted in the investigation of murder when practised chronologically. These participants listed crime scene management phases as follows: (1) reporting; (2) activation; (3) responding; (4) handing over; (5) planning; (6) investigation and processing; (7) debriefing; (8) restoring (9); and evaluation.
- The seven remaining participants could not name the crime scene management phases which should be adhered to during a murder crime scene investigation.

In relation to the above literature on the phases of crime scene management, the responses received from participants indicate that a number of investigators with the responsibility to investigate murders were not completely familiar with the various phases of crime scene management. This limited understanding of the phases of crime scene management could be because of the lack of crime scene training interventions.

2.2.2 Prepare While en Route

Layman (2013:43) emphasises that the crime scene should be entered only by one narrowly defined route to avoid the destruction of evidence, the contamination of possible scent trails and so on. The key to successful crime scene processing is planning activities. According to SAPS National Instruction 2 of 2005 (2005b) this includes planning a walk through the crime scene, taking into consideration that the route used might need to be processed prior to the walk-through. Layman (2013:45) also mentions different methods used when searching the crime scene, such as the spiral search method, grid search method, strip or line search method and quadrant or zone search method.

2.2.3 Approach the Scene

Pepper (2005:13) encourages crime scene investigators to verify the type of crime scene they are attending, and to make sure that they have suitable, adequate and correct working equipment to carry out the examination. On arrival at the crime scene, Pepper suggests that investigators at the crime scene identify themselves to the victims or to the police officers already at the scene, and inform them of the role they are going to play at that specific crime scene. Pepper further states that investigators need to gather as much information as possible about the crime scene. Monckton-Smith, Adams, Hart and Webb (2013:62) further point out that those managing the scene have to make sure that no one enters the scene without wearing the appropriate protective clothing.

2.2.4 Secure and Protect the Scene

Sufficiently secured and well-processed crime scenes are the crux of forensic and criminal investigation. SAPS National Instruction 1 of 2015 (South African Police Service, 2015a) allocates the responsibility to secure and protect the crime scene to the first member on the scene, stating that the first member should establish an inner cordon around the perimeter of the crime scene, as well as an outer cordon around the inner cordon to enable members to perform their tasks within the inner cordon. A corpse should be regarded as a source of evidence and needs to be handled as such. SAPS Policy 5 of 2003 agrees and further gives the responsibility to the processing team to ensure that the crime scene is cordoned off and that a separate route is determined and used by all role players. Monckton-Smith et al. (2013:61) believe that preservation of the scene is the first forensic priority. They recommend a full crime scene lockdown by means of a guarded cordon, with all those entering and leaving the scene having their activities logged, and an inner cordon which encompasses the focal point, including where the crime happened, potential entry and exit routes, and places where evidence may have been moved.

Dutelle (2014:72) is of the view that, in order to maintain the integrity of the scene, the scene must be protected until all physical evidence has been documented and collected. He also states that perimeters should be established. Monckton-Smith et al. (2013:6) further acknowledge that, if the crime scene lockdown is not initiated in the crucial early stages, trace evidence will be rendered useless. Pepper (2005:14) emphasises the protection of shoeprints, stating that consideration should be given to covering footwear marks with buckets to protect or recover items that may have been in contact with body fluids. SAPS National Instruction 2 of 2005 (SAPS, 2005c) emphasises the protection of obvious exhibits, and mentions that shoeprints are among those exhibits usually found at murder scenes. From the researcher's experience as a crime scene processor, stepping plates are utilised in order to protect shoeprint impressions.

Redsicker and O'Connor (1997:331) emphasise the importance of proper crime scene processing, since errors made during crime scene processing can never be rectified. These authors further state that handing over the crime scene before finalisation of the crime scene processing limits or opens questions concerning the admissibility of any evidence found during the later entry, due to a break in the chain of custody. Redsicker and O'Connor further advise officers to avoid unnecessary conversations with reporters or people who may

congregate at the scene. Haag and Haag (2011:13) affirm that law enforcement administration and political personnel in the vicinity of a shooting event should be restricted. Haag and Haag further state that persons higher in the chain of command particularly tend to congregate around high-profile and officer-involved shootings, emphasising adherence to agencies' strict guidelines. Erzinçlioğlu (2004:29) is of the opinion that an important factor related to scene investigation is the continuity of evidence. Erzinçlioğlu further emphasises that any mistakes made during the primary examination of the scene will affect the remainder of the investigation; therefore, it should be clear where, when, how and by whom a specific item of evidence was taken.

Pepper (2005:9) similarly emphasises the continuity of evidence, highlighting that contamination of evidence should not take place. Pepper further encourages the use of correct protective clothing and sealing of packages that contain exhibits at the crime scene. In addition, Monckton-Smith et al. (2013:62) stress that crime scene managers should ensure that nobody enters the scene without wearing the appropriate protective clothing, to avoid bringing trace matter into the scene from outside or transferring trace matter from an individual to the crime scene. Pepper (2005:157) furthermore points out that protective clothes also protect the crime scene investigator against exposure to illnesses or injuries, and highlights the responsibility of the employer to make sure protective clothing is always available.

Fish et al. (2011:142) acknowledge that "maintaining the integrity of the crime scene and preventing contamination of physical evidence recovered at the scene or on the victim are crucial to the credibility of the crime scene investigator and the subsequent lab analyses." Similarly, Layman (2013:46) also emphasises a thorough crime scene search, stating that evidence must be collected in a comprehensive, non-destructive manner, within a reasonable period and with unnecessary movement at the scene kept to a minimum.

Participants were asked to respond to the following question: *Are you familiar with the steps to follow to ensure that the integrity of physical evidence at a crime scene is not compromised?* The purpose of this question was to ascertain whether participants were familiar with the steps to follow to ensure that the integrity of physical evidence at a crime scene is not compromised.

It appears from the participants' answers that the majority participants were acquainted with the steps to follow to ensure that the integrity of physical evidence at a crime scene is not compromised. However, a number of participants were not familiar with the steps to be followed to ensure that the integrity of physical evidence is maintained at crime scenes. The participants' responses to this question are summarised as follows:

- Eight participants placed emphasis on the following steps: wearing personal protective equipment (PPE) and covering physical evidence with stepping plates or convenient objects to protect against moving. These participants further responded that physical evidence must be separately packaged and that changing gloves after handling each piece of physical evidence protects the evidence from contamination. These participants were thus in agreement with the literature above, emphasising that forensic evidence should be packaged and sealed at the crime scene, that the correct packaging kit must be used, and that documentation of marked exhibits must be done at the scene. These participants also pointed out that the walk-through should be conducted using only identified exits and entrance routes, while everyone entering the crime scene wears PPE.

- Seven participants did not know the steps to be followed to ensure that physical evidence integrity is maintained at crime scenes. The importance of maintaining integrity of the crime scene by protecting physical evidence, proper packaging and handling during transportation is crucial, since the evidential value of physical evidence depends on this process. It is extremely important that all investigation officials know the importance of protecting physical evidence from further contamination.

2.2.5 Conduct a Detailed Search

A detailed crime scene search is the crux of crime scene processing, as it is the process of recovering physical evidence. Gilbert (2010:89) considers the primary motivation for searching the crime scene to be locating evidence, which might be obvious or not immediately apparent. Gilbert further motivates exercise of control and teamwork as the heart of any successful crime scene search. According to Orthmann and Hess (2013:107-108), the goal of any search during an investigation, at the crime scene or elsewhere, is to discover evidence, and search patterns ensure thoroughness. Chisum and Turvey (2007:174) are of the opinion that failure of crime scene personnel to effectively recognise the true scope of the scene and perform a sufficient search for evidence can result in areas at or related to

the scene that are not sufficiently searched and documented to support reconstruction interpretation. Dutelle (2014:137) points out the following different types of crime scene search patterns: lane/strip search, line search, grid search, zone search, and circle/spiral search. Dutelle further points out that deciding on a search type depends on factors such as the environment, the object being searched for, the number of available personnel, the terrain, requirements, and the area that can be covered by each searcher. Crime scene searches should be conducted only after overall photographs of the scene have been taken.

Layman (2013:46) suggests that crime scene investigators should survey the scene carefully before embarking on the search process. Conducting a survey of the crime scene will assist investigators to observe and document the scene, taking into consideration information from the first member and nature of evidence to make a decision about which search pattern to use. Swanson, Chamelin, Territo and Taylor (2012:67) explain various circumstances when the different crime scene search methods could be conducted. According to these authors:

- The spiral search method can be employed indoors and is normally conducted by one person.
- The strip/line search consists of the demarcation of a sequence of lanes down which one or more persons proceed. If physical evidence is encountered, the search stops and resume after it has been handled.
- The grid search method is a variation of the strip/line pattern.
- The zone/quadrant search pattern requires that an area be divided into four large quadrants, which are then examined using any of the search methods.
- The pie/wheel search entails dividing the area into a number of pie-shaped sections, usually six. According to Swanson et al. (2012:137) this type of search pattern and the spiral pattern are rarely employed.

Orthmann and Hess (2013:108) agree with Swanson et al. (2012:67) and Dutelle (2014:137) about crime scene search patterns, stating that deciding on relevant search pattern depends on the personnel available, the time limits enforced by weather and light conditions, and the circumstances of the distinct crime scene. According to Monckton-Smith et al. (2013:66), the search for and recovery of evidence should be systematic, using identified search patterns to ensure that the whole area is searched effectively.

2.2.6 Prepare Narrative Description

From personal experience, the researcher highlights the importance of a clear description of aspects at the crime scene during crime scene processing, such as times of arrival at and departure from the crime scene, address of the scene, when and where the exhibits were collected, weather and lighting conditions, whether the crime scene was left under guard, precautions taken to secure the scene, names of people involved, and conditions of the crime scene on arrival. The detailed description of the place and position where exhibits were found at a crime scene, including time, date, signature of the member and complainant or independent witness, is recorded in a scene report as stated in SAPS Policy 5 of 2003. Pepper (2005:14) confirms that all information gathered at the crime scene must be comprehensively noted on a crime scene investigation report form, and these notes must be retained for investigative and court purposes. Similarly, Ricciuti (2007:22) states that, during crime scene processing, a running description of the scene begins, either written down or dictated using a recording device. Redsicker and O'Connor (1997:332) stress that one of the most important operations mandated by proper crime scene technique is the preparation of a written record of the investigator's observations and impressions at the crime scene. These authors also caution that the notes will be scrutinised by the prosecutor who is preparing and prosecuting the case. Such notes include time of investigators' arrival, exact address, weather conditions, identity of persons present and anything that the investigators may feel is important.

2.3 CRIME SCENE PROCESSING

Tilstone, Savage and Clark (2006:107) emphasise the examination of the crime scene as a critical first step in a forensic investigation. The scene must therefore be protected against contamination but still permit access to key investigation personnel such as photographers and pathologists. In agreement with Tilstone et al., Ricciuti (2007:19) is of the opinion that crime scene processing is the most critical phase of solving crime. Ricciuti acknowledges that mistakes made at the crime scene can leave flaws in the foundation of an investigation that ultimately lead to the collapse of an entire criminal case. The widely published murder

case against murder accused OJ Simpson[2], as stated by Innes (2003:14), reveals how a crime scene that was poorly managed, evidence that was mishandled and the subsequent chain of custody requirements that was ignored, resulted in acquittal of the accused.

Dutelle (2014:135) acknowledges that searching the crime scene for related evidence is a potentially damaging event and should be undertaken only after the crime scene has been photographed. Dutelle further points out that, as evidence is located, the location of evidence should be marked and mid-range photos should be taken. Swanson et al. (2012:46) mention the following as administrative procedures for crime scene processing:

- recognition;
- identification of physical evidence;
- documentation of evidence location through sketches and photographs;
- collection, marking and packaging of evidence; and
- establishment of the chain of custody or control during all stages of handling the evidence.

Horswell (2004:98) encourages investigators to identify and apply an appropriate search pattern, accurately record details of the scene and locate physical and trace evidence. Monckton-Smith et al. (2013:62) acknowledge that a dead body is also a source of evidence. Swanson et al. (2012:235) state that, before moving or touching the dead body, thorough photographs of everything must be taken. Swanson et al. further identify the following evidence that could be found on a dead body: blood, vegetation, soil, maggots, carpet fibre, paint, DNA and bite marks.

[2] Nicole Simpson and her friend Ronald Goldman were found murdered on 12 June 1994. Simpson's former husband, OJ Simpson, was suspect of her murder. Simpson was arrested but later acquitted as it was revealed in court that the police did not follow proper crime scene investigation procedures. Firstly, Simpson's telephone was used by police first responders at the murder scene to report the murder. As a result, fingerprints and DNA evidence was compromised. Secondly, Simpson's body was covered by detectives with a blanket that compromised any fibre and or hair that could be used as evidence. Thirdly, no personal protective gear was worn by detectives at the scene. A police video taken of the crime scene further revealed investigators dropping blood swabs and wiping tweezers with their hands. A blood stain found on a gate were only swabbed after almost three weeks. Further objections by the defence were that protective gloves used by crime scene experts were not changed between handling of exhibits and Simpson's blood samples. The defence explained this negligent behaviour of crime scene experts as the reason why Simpson's blood was mixed with the victim's blood.

Pepper (2005:114) reckons that, at murder crime scenes, the body should be treated at the scene of crime because it can provide a great deal of evidence that may lead to both the perpetrator and the cause of death being discovered. Gilbert (2010:285) cautions that blood on the victims is not always the victim's own; the bloodstain may belong to the offender. Layman (2013:7) views it as the job of the criminal investigator to know how, when and where to look for evidence. Layman further states that investigators must be able to draw on various sources of information about the crime scene, technological advances in evidence collection and preservation, and their own training and experience in investigative techniques. Monckton-Smith et al. (2013:10) emphasise the importance of training police, investigators and other personnel to enable them to make logical, structured and accountable decisions in often challenging circumstances.

Dutelle (2014:12) claims that law enforcement officers contaminate the scene, although not intentionally, and that the destruction of evidence should be prevented. Dutelle further acknowledges the necessity of developing crime scene investigators, and highlights that crime scene investigators should acquire continuing education and training. Gilbert (2010:83) similarly emphasises training of investigators in crime scene processing, stating that officers must understand, through training and agency policy, that for a scene to be effectively processed, only the minimum number of assigned personnel can be allowed within the scene. Horswell (2004:112) states that the examination of a crime scene and subsequent collection of potential evidential material require special skills, knowledge and aptitude. Horswell additionally states that biological evidence is delicate; thus, certain precautions need to be taken into consideration to prevent contamination and to preserve, since contaminated biological evidence loses its value and its analysis serves no purpose. Paulsen, Bair and Helms (2010:57) assert that, in most departments, crimes are assigned to detectives categorically, meaning that a detective specialises in a crime type and is only assigned those cases.

Participants were asked to respond to the following question: *Are you familiar with the required procedures to process a crime scene?* The purpose of this question was to explore whether participants were acquainted with the processes to follow at a crime scene.

It appears from the participants' responses that the majority of participants were familiar with the required procedures to process a crime scene. However, it came to light that these

procedures were often not executed by the responsible crime scene experts. The participants' responses to this question are summarised as follows:

- Eight participants mentioned that the following activities should take place during the processing of a crime scene:
  - video graphic recordings;
  - photographs of the crime scene; and
  - collection, packaging and despatch of physical evidence.
- These participants further mentioned that these activities were not always done to their satisfaction, explaining that their areas had high volumes of murders and they believed that there were not enough crime scene processors to spend enough time on murder scenes in order to efficiently process the crime scene. Further, one participant pointed out that LCRC members serving the participants' policing area did not conduct video recordings of crime scenes. This participant believed that videography was crucial, but disclosed that crime scene processors often refused to attend to their requests during crime scene processing, creating difficulties in open communication and hampering the desired results.
- Four participants mentioned that documenting the location of evidence at the crime scene through sketches should take place. In contrast to the above participants, these participants further stated that crime scene processing was done in chronological order, with the following steps: wearing of PPE, walking through the crime scene to identify exhibits and mark exhibits, documenting the crime scene on a scene report, and taking videos and photographs of undisturbed crime scene.
- Three participants were not exactly certain what the required procedure was to process a crime scene. These participants only mentioned that CSM (LCRC) experts would process crime scenes.

2.3.1 Identification of Physical Evidence

Physical evidence is defined as objects that are linked to the commission of a crime (Ogle, 2004:4). According to Houck (2006:128), physical evidence is recommended as more influential and reliable, and provides more valid information about a crime. Clear identification of physical evidence at the crime scene is the cornerstone of a successful investigation. Without identifying physical evidence, there will be no evidence or photographs will not depict evidence for the court to analyse and reach a correct decision.

SAPS Policy 5 of 2003 states that physical evidence should be photographed as found, then marked and re-photographed. The document further states that the evidence should be indicated by means of using alphabetical cones and/or measuring units.

Marking items of physical evidence is very important as it keeps credibility and control in order to identify items of evidence at a later stage, as evidence will change hands and later end up at court. According to the CR & CSM Standard Operating Procedure (South African Police Service, 2014b:3), crime scene technicians should divide the crime scene into zones, ensure that the area has been properly photographed and exhibits marked according to zones, with capital alphabetic values from A to Z. Robinson (2010:306) believes that a photo identifier should contain the case number rather than the crime type (as he acknowledges that crime type might change before the case gets to the court of law), the date when first image was taken, the address or location of the photograph, and the name of the photographer. Maceo (2010:8) points out that photographs and latent print lifts recovered from the scene must be marked with information that reflects the origin of the latent print lift or photograph, which consists of: case number, date recovered, address of investigation, the item from which the latent print was obtained, the unique marking of the latent print examiner and the latent designator.

2.3.2 Collecting and Packaging of Physical Evidence

Simply collecting physical evidence is not enough – to be of value, the evidence must be legally seized and properly and legally processed (Orthmann & Hess, 2013:129). Geberth (2015:704) acknowledges that poor collection and preservation of biological evidence not only compromises the value of physical evidence, but also exposes the crime scene investigator to pathogens such as hepatitis B and C, and HIV. Brown and Davenport (2012:9) argue that proper training and sound communication are essential for experts in the field as well as in the lab as mistakes done during collection, will put the entire process in jeopardy. Horswell (2004:100) acknowledges that the collection and packaging of exhibits in a proper manner will prevent contamination, ensure exhibits are identified by appropriate labelling, and establish a record of exhibits collected.

Brown and Davenport (2012:297) point out the following factors to be taken into consideration when collecting DNA evidence:

- Avoid sneezing or coughing near the evidence.

- Never use bare hands when collecting evidence.
- Discard gloves after each piece of evidence collected.
- Always make sure each piece of evidence is packaged separately.
- When evidence such as blood or semen is collected, the object that bears it must be air-dried. After drying, place the evidence into an envelope or paper bag.
- When transferring evidence from an object that cannot be removed, use a cotton swab and water, and store/package each swab separately after it has been air-dried.

Layman (2013:7) states that greater emphasis should be placed on the gathering and use of physical evidence when applicable, as it can be effective in corroborating other evidence of suspect identification. Layman further states that not all police departments use extensive training of evidence technicians, but agrees that many have established policies to regulate situations in which they should be used. Savino and Turvey (2011:86) argue that some investigators have been trained inappropriately to think that physical evidence is their enemy because it might contradict the statements of the victim; therefore, they conduct their investigation as though it is best to leave some or all of the evidence uncollected or untested.

Each piece of evidence is packaged differently based on its chemical and physical properties (Brown & Davenport, 2012:10). For example, the procedure to be followed when packaging fingerprints differs from the procedure to collect DNA-containing exhibits. Although all exhibits need to be photographed in their original position, packing differs because fingerprints are lifted and certain information has to be written on the back of the lifter, while with DNA-containing exhibits, swabs are packaged in swabbing kit boxes. Chisum and Turvey (2007:176) agree with this and further state that collection and packaging of evidence should be done in a manner that preserves it for subsequent analysis and interpretation.

Erzinçlioğlu (2004:29) states that the evidence must be packaged and labelled in such a way that there can be no doubt as to its history. This chain of custody is maintained by keeping a record of signatures on the label of the container-bag or glass tube when it is handed from person to person. The chain of custody (also known as continuity of possession) of exhibits is among the most important process of exhibits handling. In South Africa, the process differs in the sense that registers and electronic systems are used to sign for exhibits changing hands – no signatures or initials are placed on the exhibit seal. Brown and Davenport (2012:11) point out that the chain of custody preserves the integrity of the evidence and provides a mechanism of accountability because the names of people who handled, analysed

or transported the exhibit are recorded. This demonstrates to the courts that the evidence being presented at trial is free of contamination, alteration or substitution.

Swanson et al. (2012:281) are of the opinion that keeping careful records of the chain of custody of the evidence and protecting the evidence from contamination are crucial both for preserving the sample itself so that it can be analysed and for ensuring that conclusions drawn from the analysis of the sample cannot be challenged in court. Using physical evidence in solving murder is crucial as what would have been the reliable witness is the deceased person in certain cases, and any physical interaction leaves a trace – the more violent the contact, the more physical evidence is left. Birzer and Roberson (2012:85) acknowledge that Locard's theory of exchange can be basically stated as: Every contact leaves a trace. This means that, when a person comes into contact with an object or another person, an exchange of material will happen – the person will leave something behind and take something with him/her.

Similarly, Bertino and Bertino (2008:22) point out that, whenever two people come into contact with each other, a physical transfer occurs: hair, skin cells, clothing fibres, pollen, glass fragments and debris from a person's clothing can be transferred from one person to another. Although every contact is believed to leave a trace, if the trace evidence is not treated with care and the correct process of documenting, marking, collecting and packaging is not maintained, the evidence will lose its evidential value. Gilbert (2010:94) assert that items of evidence must be properly marked. After an item of evidence has been located and recorded, Gilbert further emphasises that the packaging must be completed at the crime scene. However, Gilbert understands that, in certain situations, physical evidence can be packaged at the police headquarters and points out that evidence should be packaged in separate clean containers.

The delicateness of DNA requires crime scene investigators to wear protective clothing to avoid leaving and taking away some biology evidence at the crime scene. Gilbert (2007:272) emphasises that evidence that may contain DNA must be collected with great care, as contamination and preservation problems can occur at any time. Fish et al. (2011:141) emphasise that the crime scene investigator should be sure to wear PPE and label all samples with biological warning labels, depending on the condition of the biological fluid. Fish et al. (2011:151) suggest that wet body fluid stains should be collected using clean, sterile cotton swabs or clean, sterile gauze patches, which should be allowed to air-dry before packaging.

According to Gardner (2012:35), the crime scene technician generally collects the stained article and, after air-drying the items, submits them for evaluation to the crime laboratory. Dutelle (2014:7) emphasises that the person responsible for crime scene processing is rarely involved with the subsequent analysis of the collected evidence.

Ingram (2012:616) is of the opinion that, if a sample is not labelled properly, a significant break in the chain of custody has occurred and a trial court may rule that the proper foundation has not been made for the introduction of the results of the scientific test. Houck and Siegel (2010:275) emphasise the prevention of contamination on the side of a laboratory employee. If care is not taking in DNA extractions and typing, biologic material from an extraneous source, such as an evidence technician, scientist or laboratory technician, can be introduced accidentally, resulting in serious problems. Therefore, DNA-containing material should be packaged in such a way that degradation is avoided.

Participants were asked to respond to the following question: *Do you ensure the collection and packaging of physical evidence at a murder scene by the CSM unit?* The purpose of this question was to investigate whether participants guaranteed the gathering and packaging of physical evidence by members of the CSM unit.

It appears from the participants' responses that the majority participants ensured the collection and packaging of physical evidence at a murder scene by the CSM unit, as all 15 participants indicated that they did ensure the collection and packaging of physical evidence at a murder scene by the CSM unit.

Participants were further asked to respond to the following question: *What is the value of efficient collection and packaging of physical evidence at a murder scene?* The purpose of this question was to determine whether participants understood the significance of proficient collection and packaging of evidence at a murder scene.

It appears from the participants' responses that the majority of participants understood the significance of proficient collection and packaging of evidence at a murder scene. However, it became known that a number of participants had a rather limited understanding of the value of efficient collection and packaging of physical evidence at a murder scene. The participants' responses to this question are summarised as follows:

- Ten participants correctly named the following factors as valuable of the efficient collection and packaging of physical evidence at a murder scene:
  - to bring evidence to court;
  - to establish the role played by suspects and victims through analysis of physical evidence;
  - to solve the murder and link suspects and complainants, or exclude suspects;
  - to retain the integrity of physical evidence;
  - to prevent contamination;
  - to maintain the chain of custody;
  - to establish the identity of a suspect;
  - accurate analysis; and
  - to save resources as correctly handled exhibits will be analysed.
- Five participants' understanding of the significance of proficient collection and packaging of evidence at a murder scene was limited compared to that of their colleagues above.

2.3.3 Document the Crime Scene

Orthmann and Hess (2013:41) point out that documentation is vital throughout an investigation. Dutelle (2014:112) believes that the purpose of documenting the crime scene is to record and preserve the location and relationship of discovered evidence, as well as the condition of the crime scene as it was at the time the documenter was observing it. The efficient recording of the crime scene helps investigators to recall the events in the future and may be presented in court. Monckton-Smith et al. (2013:62) assert that the crime scene can be recorded by means of photographs, written logs, sketches and video or computer-generated virtual reconstruction.

Layman (2013:45) states that a crime scene has to be documented before the start of the actual search and believes that this will assist the investigator to determine the facts of the crime and to identify the perpetrator, and aid in the arrest and criminal prosecution of the perpetrator. Pepper (2005:17), on the other hand, argues that accurate note-taking about the examination of the crime scene and the later completion of statements cannot be emphasised enough. Pepper further states that the defence may apply for a court order to gain access to information that the prosecution may possess, including evidence and the paperwork that the crime scene investigator completes.

In South Africa, the reservation of access to evidence by the defence is stated in SAPS Policy 5 of 2003, which states that the defence should apply to the information officer in order to access dockets, registers and exhibits – then the court can order the exhibits to be placed in the possession of the defence. Joubert (2013:395) states that section 60(14) of the Criminal Procedure Act provides that, although an accused shall not have access to any information, record or document in the police docket for bail proceedings, the prosecutor may still allow such access. Furthermore, an accused is not entitled to have access to the B and C sections of the police case docket. Pepper (2005:18) emphasises that the writing of the report at the time of the examination, as well as the notes, should be comprehensive and factual, identifying what was done in a logical manner and specifying the exact location of every piece of evidence recovered. Monckton-Smith et al. (2013:65) believe that documenting the crime scene (logging entry, exit, all actions within the scene including evidence collection and photographs taken) is as valuable as protecting and preserving the crime scene. Dutelle (2014:248) emphasises that every action that officers take at a crime scene must be fully documented.

Participants were asked to respond to the following question: *Do you ensure proper documentation of physical evidence at a murder scene by the CSM unit?* The purpose of this question was to establish whether participants assured appropriate documentation of physical evidence found at a murder scene.

It appears from the participants' responses that the proper documentation of physical evidence at a murder scene was questionable since exhibits at murder scenes were often not properly documented and exhibits were often not booked into the exhibit store. The participants' responses to this question are summarised as follows:

- All 15 participants asserted that they ensured proper documentation of physical evidence at a murder scene. However, 10 of these participants did not explain how they ensured proper documentation of physical evidence at a murder scene.
- Two of these participants correctly explained that proper documentation was by booking exhibits in the SAPS 13 (exhibit register), taking photographs, videos and sketch plans, with exhibits and related objects photographed in detail and evidence to be prepared by means of photo albums and complete plans.
- Three participants pointed out that not all exhibits at murder scenes were properly documented at murder scenes by the CSM unit. These participants were further of the

opinion that CSM members in their policing areas did not book in exhibits at the SAPS 13.

Participants were further asked the following question: *What is the value of efficient documentation of physical evidence at a murder scene?* The purpose of this question was to assess participants' views concerning the importance of effective documentation of physical evidence at a murder scene.

It appears from the participants' responses that the majority participants were familiar with the value of efficient documentation of physical evidence at a murder scene. Although most participants did not know how to ensure efficient documentation of physical evidence at a murder scene, they were well aware of the value of the efficient documentation of the crime scene. However, a number of participants could not confidently explain the value of efficient documentation of physical evidence at a murder scene. The participants' responses to this question are summarised as follows:

- Ten participants regarded the followings reasons for the efficient documentation of physical evidence at a murder scene:
  - to 'transfer' the crime scene to court by means of images/photographs;
  - to help the court to reach sound findings;
  - to solve the case;
  - to place suspect at the crime scene;
  - to avoid contamination;
  - to keep accurate records for court proceeding and further referencing;
  - integrity of physical evidence leads to convictions;
  - to enable experts to prepare statements;
  - to refresh memory; and
  - chronological evidence to be presented in court.
- Five participants mentioned photography and videography as the procedures of documenting the crime scene.

2.3.4 Dispatch Physical Evidence

Exhibits that may contain DNA should be kept dry and at room temperature. Exposing evidence to direct sunlight and above room temperature conditions could be harmful to DNA. Chisum and Turvey (2007:179) acknowledge that the manner in which packaging and

transportation of physical evidence are done could have an effect on such evidence. Chisum and Turvey further state that specific evidence collection guidelines that are adopted must preserve the evidence in transport, prevent cross-contamination and spoilage, and provide for later identification. Houck and Siegel (2010:39) point out that, when collected evidence is transported to the laboratory by police personnel, a form or a letter must be included that details what is submitted, under what criminal circumstances, who is submitting the items, and what laboratory examinations are required.

A covering letter that accompany exhibits to the forensic laboratory must have the following information: address of the investigator and contact details, case reference number, charge, LCRC number, short description of the incident, date and times of the investigation, type of analysis requested, exhibit bag seal numbers for transported exhibits and the particulars of the person who is submitting the evidence. Before exhibits are transported to the laboratory, they are dispatched/booked out on the Crime Information Management System and on relevant registers (SAPS, 2015:3).

Horswell (2004:56) emphasises the importance of the chain of custody, which he describes as documentation of possession of items from their recovery/collection, through examinations, to their tendering in court as potential items of evidence. This process allows interested parties to trace who had custody of the item at a given time and to account for where the item has been while in an individual's or organisation's custody.

2.4 RECORDING OF EVIDENCE AT THE CRIME SCENE

Swanson et al. (2012:641) categorise diagrams, sketches, photographs and video recordings as demonstrative or illustrative evidence, as they are used to help the jury to understand the condition that existed and to ensure that the jury is not prejudiced against the defendant. Orthmann and Hess (2013:46) assert that photographs and video recordings reproduce the crime scene in detail for presentation to the prosecution, defence, witnesses, judge and jury in court, and are used in investigating, prosecuting and even police training.

Dutelle (2014:29) suggests that crime scene investigators should adopt a systematic approach to crime scene processing in order to eliminate errors that might result in evidence being declared inadmissible by the court. Swanson et al. (2012:69) encourage crime scene investigators to properly document the crime scene by means of digital video recording, digital still photographs and sketching; they are certain that such documentation will enable

other people to accurately understand the scene and what happened there. Monckton-Smith et al. (2013:62) suggest that the crime scene manager and the investigator should develop a strategy for processing and interpreting the scene, which will help them in identifying the tasks to be completed. Murder crime scenes need to be secured and documented, with collected evidence being preserved. Swanson et al. (2012: 281) acknowledge that physical evidence in a case is often the decisive factor in determining guilt or innocence.

2.4.1 Photographic and Video Graphic Images

Joubert (2013:381) points out that section 232 of the Criminal Procedure Act provides for proving an object by means of a photograph thereof. Although the court accept photographs as real evidence, Orthmann and Hess (2013:55) comment that photographs must be taken under certain conditions and must meet specific criteria to be admissible in court, since the main reason is to bring to the court the status of the crime as found by the forensic investigator and an explanation of the evidence marked and collected. Robinson (2010:324) states that photographs of the crime scene should be taken at a full 360 degrees in order to capture the complete set of interiors, if inside a building. The manner in which the crime scene is handled and the procedures that have been followed during crime scene processing should be within accepted conduct and adhere to regulations and policies governing crime scene investigation. Failure to conform to policies and regulations governing crime scene investigation could result in inadmissibility of evidence and acquittal of the suspect. Geberth (2015:745) emphasises the imperative that the legal authority to collect the evidence and the proper collection techniques be considered prior to the actual collection of the evidence, as evidence collected illegally is not admissible in court.

Horswell (2004:108) states that the investigator needs to 'walk through' a virtual crime scene and provides for realistic scene processing, including the following: photography, notes, and collection and packaging of evidence. Gilbert (2010:83) says that it is vital that crime scene photographs be taken before any items are moved or altered, and acknowledges that proper photographs provide a permanent record of how the scene appeared after the offence had been discovered. Orthmann and Hess (2013:50) explain the sequence of taking photographs, stating that the initial photo that shows the entire crime scene should use a technique called overlapping. They advise that the crime should be photographed clockwise, making sure that objects which appeared on the right side of one photo appear on the left side of the next.

Orthmann and Hess further say that photographs should be taken in long, medium and close range.

Redsicker and O'Connor (1997:9) further emphasise that the crime scene should be photographed and diagrammed, and notes should be made of the progress of the investigation. Redsicker and O'Connor further highlight the use of video to visually prove that a crime actually took place and to document, among other things, items of physical evidence present at or absent from the scene. Nordby (2013:484) acknowledges that photography is important, as it is all that remains of crime scenes, bodies and even physical evidence. Nordby further emphasises that photographers should have knowledge of, among other things, depth-of-field limitations, lens distortions and length-to-object distance determination. Dutelle (2014:117) urges photographers to seek out books and courses that will help them to continually refine their skill. Orthmann and Hess (2013:55) point out that the photographs must be material, relevant, competent, accurate, free of distortion and non-inflammatory.

Monckton-Smith et al. (2013:63) caution that photographs should preferably be taken before any disruption to the scene, although they acknowledge the importance of protecting lives. If it happens that an item is moved prior to photography, it should not be moved back for taking photos; instead, it should be noted and logged that the movement occurred. They further state that photographs should include a scale and a photo evidence number, and the number in the photograph should correspond to the position of that number in the crime scene sketch.

According to the SAPS National Instruction 2 of 2005 (SAPS 2005d), the crime scene technician must ensure that the crime scene is recorded to provide a visual representation of the scene. This document further states that the scene must be recorded before it is altered in any way – all physical evidence must be recorded in its original position and the condition of the scene must be recorded after the conclusion of the process. The recording and photographing of the crime scene should be done according to SAPS Policy 5 of 2003, which states that overall photographs of the crime scene must be taken at least from two opposite directions, followed by a photograph of the subject and lastly a close-up of the subject.

Horswell (2004:100) emphasises that investigators must record the time, date and location of the scene, and make a detailed and accurate record of the scene. Nordby (2013:480)

believes that the original photo log, typically kept for all crime scene photographs, listing the camera used for every series of pictures, should be kept as it provides the date, time and order in which photos were taken.

Date and time of the photographs also help to determine and connect evidence and illustrate their original position. If there are changes or items are moved, the times will correspond with the photographer's explanation and reason for the change or movement. SAPS Policy 5 of 2003 stipulates that, if the crime scene was damaged in any way by LCRC personnel, the damage must be photographed and photos should be kept in a docket as reference. The item should be photographed before and after the damage has occurred.

Ricciuti (2007:22) states that photographers are called into the crime scene to take photos of all elements of the scene and individual evidence. Photos are taken from several angles to fix the location and aerial photography is sometimes employed at expansive scenes. Pepper (2005:30) acknowledges the importance of photographs, saying that photographs tell the story in colour without words, and photography always comes first when examining a crime scene, with everything being recorded as it was found. Pepper further mentions stages of taking photographs as first capturing the overview, followed by mid-range photographs and lastly close-ups. Similarly, Dutelle (2014:120) asserts that the first photos taken at a scene should be of the overall crime scene followed by mid-range/evidence-establishing photographs and close-up/comparison/examination photographs. Layman (2013:27) also supports this order of taking photographs and encourages photographers to take as many photos as they can, as he is of the opinion that there can never be too many pictures.

Dutelle (2014:126) suggests that the video recording of a crime scene needs to contain an introductory placard that states the case number, date, time, location, and other pertinent case and chain of custody information, followed by a general view of the area surrounding the crime scene. The audio on the video recorder should be turned off unless there is an intention to narrate, the camera should not be moved too quickly by panning or zooming, a flashlight should not be used and the video never should be edited or altered. Orthmann and Hess (2013:50) are of the opinion that photographers need training programmes that include instructions on identifying and filing photographs and on establishing and maintaining the continuity of the chain of evidence.

2.4.2 Crime Scene Sketches

According to Gilbert (2010:86), a crime scene sketch is a measured drawing of a scene showing the locality of all the significant items, particularly physical evidence. Swanson et al. (2012:71) view a crime scene sketch as a basic diagram of the crime scene that illustrates important points, such as the locations where various pieces of physical evidence were found. Similarly, Gardner (2005:163) explains a crime scene sketch as a graphic document to show the layout, positioning and interrelationships of the crime scene and the evidence.

According to Redsicker and O'Connor (1997:340), the drafting of a thorough and accurate crime scene sketch is essential in the documentation of a scene. Sketches are aimed at showing the relationship of objects to each other, to give an overview of the scene that cannot be correctly depicted by photographs, to eliminate clutter and items not important to the investigation, to clarify issues and refresh the memory of witnesses, and to avoid unnecessary (and at times legally prohibited) return trips to the scene. Redsicker and O'Connor further state that measurements taken of a room and to locate evidence in the room must be exact.

Monckton-Smith et al. (2013:63) reckon that sketches provide a great field of view, eliminate distortion and show only important features, which is why it is vital to have sketches that include all evidence and that correspond with the photographs and the photograph evidence markers. Layman (2013:30) acknowledges that crime scene sketches complement photographs and videos taken of the crime scene and play a vital role in showing the actual scene. Layman further states that sketches provide the exact distance between the exhibits/physical evidence, which assists the prosecutor during trial. Layman advises investigators to use the same method of measuring, for example tape measure or pacing, for all the evidence, and to draw the final sketch according to scale.

Dutelle (2014:126) describes a crime scene sketch as a permanent record of the size and distance relationships of the crime scene and the physical evidence within. Dutelle further explains that sketches serve to clarify the special information present within the photographs and video documentation, because the other methods do not allow the viewer to easily gauge distances and dimensions. Further to this, Orthmann and Hess (2013:58) state that all measurements must be accurate. They disapprove of use of shoe length measurement, estimation of distance or use of pacing. Instead, they emphasise that conventional units of

measurements, such as inches, feet or yards, should be used and measurements should be taken without moving any object. For an example, if there is a dead body, a firearm and a cartridge case inside the room on the floor, measurements showing the length and width of the room, measurements from the wall to each exhibit and measurements between exhibits should be taken.

2.5 THE LOCAL CRIMINAL RECORD CENTER

According to Kempen (2014:11), the importance of LCRCs is to render support services to investigators in the investigation of crime, such as murder, which results in crime scene experts reporting at crime scenes sooner in order to secure evidence. The primary responsibilities of the CSM section at LCRCs include facial reconstruction, identification of suspects through comparing fingerprints collected from crime scenes with fingerprints on the Automated Fingerprints Identification System and on the SAPS 192 fingerprints form, and crime scene processing. Crime scene processing plays a major role in assisting detectives during criminal investigations through photography, videography, collecting fingerprints, footprints, shoeprints, tyre prints and tool marks, evidence processing, evidence collection and analysis of fingerprints.

The CSM section ensures that the crime scene is processed and managed efficiently in order to eliminate contamination, to document, identify and package exhibits and to conduct analyses according to prescribed policies and procedures. Section 37 of the Criminal Law (Forensic Procedures) Amendment Act, 6 of 2010 regulates the taking, usage, storing, retention and destruction of data through finger-, palm- and foot prints, photographic images and keeping of databases. If furthermore authorises comparative searches against other databases and security measures relating to the integrity of information stored in the databases, ascertaining of bodily features, taking of blood samples and taking of photographs. The Criminal Law (Forensic Procedures) Amendment Act, 37 of 2013 gives a legislative framework to forensic DNA analysis and comparative searches, and further elaborates on retaining fingerprints of convicted persons in a database. It states that such fingerprints may be used for purposes of detecting crime, investigating an offence, identifying missing persons, identifying unidentified bodies and during conduction of a prosecution.

Although blood samples are taken by qualified medical or nursing staff, samples are dispatched to the forensic laboratory by investigation officers so that laboratory scientists can compare them with physical evidence from crime scenes. Buccal samples may be collected by an authorised person of the same gender as the person from whom the sample is collected (Joubert, 2017:169).

Joubert (2017:70) acknowledges that police should investigate cases properly and that the prosecutor should present the State's case competently. Joubert further emphasises the need for cooperation between the prosecutor and the police during investigation and prosecution of the case. The Forensic Manual for Detectives (SAPS, 2017:8) points out the importance of first responders, crime scene investigating officers and forensic field workers leaving no stone unturned when it comes to evidence. In cases where an eyewitness has come face to face with the murderer, the face of the murderer can be reconstructed by means of an "identikit", which is made up of photos of facial features. This is assembled with other facial-feature cards to make a composite face (Wells & Hasel, 2007:8).

Crime scene experts also attend to dead bodies at the mortuary to document injuries in the presence of the pathologist, as mentioned by Prahlow (2010:136). Identifying markers bearing the unique autopsy number and a measuring scale should be included in a sufficient number of photographs, especially of major injuries, to ensure that the photos correspond to the specific case. It is vital for the crime scene expert to attend to murder scenes as soon as possible after the murder, as forensic evidence such as fingerprints and DNA is delicate and can be easily destroyed. Effective communication between investigation officers, prosecutors and crime scene experts is highly encouraged as lack of communication might jeopardise the outcome of the criminal case. Palmioto (2013:108) asserts that searches against prints on a database lead to rapid identification of the perpetrator and his/her timely arrest.

2.6 THE FORENSIC SCIENCE LABORATORY

The Forensic Science Laboratory consistently strives to enhance its services to law enforcement and criminal justice. Throughout the analysis of evidence collected at crime scenes, laboratory technicians use the most recent scientific technological innovations to examine forensic evidence in criminal investigations. Furthermore, South Africa has established a national DNA database, which is very helpful in linking suspects, as the SAPS

is authorised to take or have samples taken from suspects arrested and authorise comparison of such DNA samples with DNA collected from a crime scene. The analysis unfortunately also links police members who did not take precautionary measures during crime scene investigation. The national DNA database is regulated by The Criminal Law (Forensic Procedures) Amendment Act, 37 of 2013.

Swanson et al. (2012:205) assert that the mission of a forensic laboratory is to contribute to the criminal justice system by seeking the truth through the scientific analysis of physical evidence. Kierly (2001:5) points out the significance of forensic science to the criminal justice system, as it initially rests upon the police authorities at the scene of a crime to recognise an item as having potential value and to properly collect and store it prior to laboratory analysis. He further encourages increased training in advanced procedures for crime scene analysis. Palmioto (2013:119) acknowledges that crime laboratories contribute to the criminal investigation process, as physical evidence is analysed in laboratories, and laboratories provide factual data and evidence based on scientific principles that will be used in court.

Physical evidence collectors should be sensitised, as mishandling and incorrect packaging of evidence will compromise the results of analysis at the forensic laboratory. Saferstein (2011:2) mentions the following professions which practice forensic science: criminalistics (practitioners and detectives), digital and multimedia sciences, engineering sciences, jurisprudence, odontology, pathology/biology, physical anthropology, psychiatry/ behavioural science and toxicology. Kierly (2001:37) believes that hair analysis, fibre, glass fragment and paint chips analysis, soil analysis, ballistic and tool marks analysis, fingerprints, footwear, tire impression, blood spatter analysis, DNA analysis, forensic anthropology, forensic archaeology, forensic pathology, forensic odontology, question document analysis, and forensic psychiatry and psychology are most important among the body of forensic sciences.

Participants were asked to respond to the following question*: Do you ensure that the CSM unit and the SAPS forensic services attend murder scenes to render support services to secure evidence, and does their involvement contribute to the effective processing of the crime scene?* The purpose of this question was to explore whether participants ensured that the CSM unit and the SAPS forensic services attended murder scenes to render support

services to secure evidence, and to ascertain whether their involvement contributed to the effective processing of the crime scene.

It appears from the participants' responses that all 15 participants ensured that the CSM unit and the SAPS forensic services attended murder scenes to render support services to secure evidence and that their involvement contributed to the effective processing of the crime scene. However, it was revealed that there was a belief among some investigation officials that forensic services employees only worked in a laboratory and only received physical evidence despatched to the laboratory. Participants further expressed that the services of forensic science laboratory personnel were not utilised at most murder crime scenes.

2.7 IMPRINT EVIDENCE AT THE CRIME SCENE

Imprint evidence is the most common forensic evidence found at murder crime scenes and could be in the form of shoe-, finger-, palm- or footprints. In addition, imprint evidence could also be caused by motor vehicle tyres, glove marks, bite marks, tool marks (such as saw marks) or screwdrivers, or imprints could be found on the outside part of spent cartridge cases. Imprint evidence possesses unique characteristics that enable the forensic analyst to find a match through comparison when a sample is received.

According to the Locard principle, which states that contact between two objects of surface leaves a trace, imprints are caused by the pressure caused by an object on a surface at a crime scene. The way in which the crime scene examiner deals with the imprint evidence is the crux of forensics, as the reliability of evidence would be tested in court based on procedures followed at the crime scene. Imprint evidence has to be detected, protected, photographed, lifted, collected or packaged, documented, analysed, safeguarded and later presented at court.

2.7.1 Shoe Imprints

Dutelle (2005:298) explains that footwear impression evidence is located primarily on the ground surface, which sometimes makes it problematic or inconvenient to find, particularly if the impressions are latent or approximately invisible. Dutelle further points out that many crime scene technicians have little or no experience in searching for these types of impressions. Dutelle additionally mentions four basic methods of recording footwear impressions at the crime scene, namely, photography, documentation/sketching, casting and

lifting. Pepper (2005:48) asserts that footwear marks will not always be immediately visible and points out that great care needs to be taken when approaching the scene, as footwear marks reveal to the crime scene investigator the way the offender entered and exited the scene. When discovered, shoeprints should be covered to protect them, then be photographed close up, before being casted. Monckton-Smith et al. (2013:68) assert that visible shoe prints can be photographed and lifted in a similar way to fingerprints, using adhesive tape or an electrostatic lifter and foil. The recording method of shoeprint impressions depends on the surface in which the shoe print is on. For example, shoeprints on sand cannot be lifted, but will be photographed and cast to record shoe print impression, whereas prints on smooth surfaces such as tiles, counters or glass can be photographed and lifted with adhesive tape. Dutelle (2014:298) also places emphasis on the thorough documentation of footwear evidence, both in written reports and in the crime scene sketch.

2.7.2 Tyre Imprints

Monckton-Smith et al. (2013:68) point to the fact that vehicles will leave evidence of their contact with a surface, commonly in substances such as mud or earth, which presents the possibility of multiple forms of evidence which make up the tyre print. However, Dutelle (2014:306) cautions that tyre tracks are often forgotten or overlooked at crime scenes, due to lack of knowledge or inexperience about locating, documenting and collecting such evidence. Gilbert (2010:204) points out that tyre impressions should initially be recorded through photography, in a similar fashion to latent fingerprints. Dutelle (2014:307) further emphasises that tyre tracks should be documented through overall, mid-range and close-up photographs, casting, and measurements.

Pepper (2005:54) states that, in order to locate tyre impressions, the crime scene investigator needs an enquiring mind and a good light source, often shone at an oblique angle. Pepper further accentuates that, before the tyre impressions can be recovered, they are initially photographed in their surroundings in order to locate them with reference to the rest of the scene and must be photographed close-up along their entire length. Thereafter, they must be segmented into manageable sections and then each section must be cast using a casting medium.

Orthmann and Hess (2013:159) similarly emphasise the correct procedure to be used during collection, recording and analysis of tyre impressions, as they believe valuable investigation

data depend on it. Furthermore, Tilstone et al. (2006:273) indicate that accurate measurements of tyre tracks can provide useful information on the make of the tyre, the year of production and the model of the suspect's vehicle. These authors further point out that tyre tracks are processed similarly to footprints or shoeprints.

2.7.3 Fingerprints, Palm Prints and Footprints

The term 'fingerprint' normally includes palm prints and footprints as well. According to Pena (2000:77), fingerprints are one of the most common types of physical evidence found at the crime scene and frequently prove to be the most valuable in terms of identifying the suspect and placing him/her at the crime scene. The chain of custody should be sustained, unbroken, from the time of the collection of the evidence until it is presented in court (Layman, 2013:175). Lyle (2012:280) explains that surfaces that could provide prints with evidential value include, among others, objects left behind by the criminal, opened drawers or out of place furniture. For example, a print found in the bedroom wardrobe drawer will have more evidential value than prints found on an item that was found outside the house.

Becker (2009:133-134) states that the investigator should attempt to remove the print from the crime scene, either by preserving the item upon which the print lies or by lifting the print. Becker further explains the process of collecting the print – the print is lifted by the print lifter, which is the transparent tape that is placed on the powdered print with the adhesive side down, and when the tape is removed, the fingerprint powder is removed with it. The lifter is provided with a black or white card upon which the transparent tape and powdered print can then be placed, adhesive side down, after which the print can be visualised. Similarly, Houx (2007:67) explains that "the method of developing latent prints on crime scenes is by applying fingerprints powders which are brushed lightly over a suspected print to produce contrast between the background and the now visible print."

Tilstone et al. (2006:152) mention the use of adhesive tape, whereas Gilbert (2007:446) mentions that fingerprint powders are used to make visible or develop prints. In agreement with Becker (2009:133-134), Houx (2007:67) and Tilstone et al., Gilbert narrates that process of lifting prints involves the placement of a clear adhesive tape or an adhesive rubber lifter against the powdered latent impression to transfer the impression, after which the lifting tape is adhered to a clean paper card for preservation or the adhesive rubber surface is covered with a transparent celluloid cover. When one considers the recovery and

importance of fingerprints, the authors agree that fingerprints are collected from the crime scene for court purposes and must not be tampered with during the investigation. Investigators should consider everything at the crime scene as important and should take photographs of everything, since it might come in question in court after an extended period.

Pepper (2005:75) acknowledges that some chemicals used to develop fingerprints are harmful to DNA and advises that the crime scene investigator should evaluate the chemicals and choose the one that poses no threat to the value of DNA (preferably Amido black, as it stains proteins in blood but does not damage the recovery of DNA evidence). Pepper further points out that, if the chemical ninhydrin is to be used, DNA evidence should be collected first. In addition, Pepper states that any fingerprint found at the crime scene should be photographed. Dutelle (2014:186) suggests that, if DNA analysis of print residue is expected to be used, the crime scene investigator is encouraged to contact the appropriate crime laboratory prior to utilising chemical methods of processing so that any contamination or damage of DNA-related evidence can be avoided. It is recommended that DNA-containing evidence should be collected before the crime scene is treated with powders and chemicals for fingerprint development. Dutelle (2014:122) emphasises the use of a scale of reference, which exhibits all relevant details on the item of evidence, when taking a close-up photograph.

According to Komarinski (2005:39), fingerprints are relatively inexpensive to capture. Making an identification of a print from a crime scene may not even require the use of a computerised identification system; the examiner may rely instead on the images from a ten-print card, the latent print and the expertise of the examiner. Fingerprinting does not require a laboratory for analysis and fingerprints remain relatively constant over time, with the exception of injury. Every day, millions of identifications are made using fingerprint images. Pepper (2005:73) states that the following information should be endorsed on the lifter: name of the person finding the fingerprint, the date, location and identifying mark, offence type and thumbnail sketches depicting location of the fingerprint. If the fingerprint lift was on a vertical surface such as a window frame, the fingerprint lift should also be marked with a gravity arrow.

According to SAPS Policy 5 of 2003, the fingerprint investigator needs to furnish the following information on the back of the lifter and write all this information down on the crime scene report after each exhibit is lifted:

- from what object the print was lifted;
- arrow on the print lifter indicating the top part of the lifter during the process of lifting for prints from vertical surfaces;
- arrow on the print lifter showing away from the crime scene investigator for prints from horizontal surfaces;
- position of the object at the crime scene;
- date and time;
- address of the crime scene;
- signature of the complainant or independent witness; and
- signature of the fingerprint investigator.

In the case of photographed prints, the exhibit log or scene report is used to capture the information as digitally captured exhibits do not produce tangible documents to write on. Taking photographs of the subject, including a close-up of the subject, is emphasised by SAPS Policy 5 of 2003.

SAPS Policy 5 of 2003 clearly instructs crime scene investigators not to use any kind of casting material, as the results will display tell-tale characteristics of a transplant or forgery and the finger-, palm- or footprint will lose its evidential value. Dutelle (2014:183) suggests that, when the crime scene investigator is dealing with difficult surfaces, he/she has to utilise a combined approach of powder dusting along with lifting utilising forensic casting material or silicon. Layman (2013:61) suggests that fingerprint lifters should be used to remove the print from surfaces that are curved or otherwise difficult to photograph. Lushbaugh and Weston (2012:111) are of the opinion that fingerprints found at crime scenes reveal opportunity or presence factors which provide important leads because, when fingerprints pinpoint a person with a history of crime or link the suspect with other latent prints from another crime, the lead is significant.

James, Nordby and Bell (2014:31) describe fingerprints as an evidence category in which curious, highly individual friction ridge skin patterns are used as a means of personal identification. Similarly, Monckton-Smith et al. (2013:67) acknowledge the importance of fingerprints, stating that they are not only for positively identifying an individual at the crime scene or confirming that an individual handled a certain object – it is also possible to extract DNA from them. Linking a person to a crime scene through fingerprints, palm prints or footprints is of utmost importance to forensic investigation. Gerberth (2015:896) emphasises

the importance of examining a dead body for fingerprints. He advises crime scene processors to use MacDonnell Magna Jet Black Powder, as he believes this technique developed fingerprints on the skin of a dead body in Canada and prints were photographed. Later, a suspect print was compared with these fingerprints and an identification was made. It is advisable to examine a dead body prior to placing the body in the refrigerator. In the researcher's experience with crime scene investigation in South Africa, the fumes of cyan acrolyte are being used to develop prints on the skin of dead bodies and results are photographed.

2.7.4 Bite Marks

Teeth are also a source of evidence that can help to identify the deceased person, and marks left by biting teeth can link a suspect and a victim. Bite marks are specific to the person who inflicted them. Genge (2004:163) encourages the crime scene examiners to use an ultraviolet (UV) light to examine dead bodies for bite marks, as it reveals what the naked eye cannot see, and the image will be clear when photographed. Bite marks should be swabbed for DNA since saliva contains DNA. Geberth (2015:166) suggests that a scale of reference should be included when bite marks are photographed. According to Kubic and Petraco (2005:215), bite marks left at the scene of a crime on a victim or other items are often used to prove or disprove the involvement of a suspect in a particular crime. Platt (2003:51) confirms this by indicating that clear bite marks with distinctive teeth can near certainly identify a suspect. Normally, photographs, casts and tracings of the suspected bite marks are directly compared to a cast made of the suspect's teeth.

2.7.5 Firearms, Bullets and Cartridge Cases

Guns, spent cartridges and bullets provide a trail of clues since, once the gun is fired, forensic evidence is produced, linking the victim, the weapon, the cartridge and the person who fired the shot. Joubert (2013:380) reckons that a used cartridge case or bullet lodged in the wall at the crime scene forms important real evidence, especially if it can be proved that it was fired by a specific firearm. The science of ballistics can be used to confirm the link.

According to Platt (2003:100), the following should be analysed with regard to firearms, bullets and cartridge cases:

- distinctive marks caused by the firing pin;

- imperfections on the breech, grooves inside the barrel that scratch the bullet in a unique way;
- ejector mechanism marks; and
- gunshot residue, which can spray on the hands and clothes of the shooter, linking the shooter to the gun.

Genge (2004:107) acknowledges that not all firearms eject spent cartridges, but do release gunshot residue that could be collected on a suspect's hands. Similarly, Geberth (2015:385) confirms that gunshot residue can be detected on the hands and clothing of the shooter. Platt further states that gunshot residue can be found on the deceased person if the shot was fired at close range. Manamela, Smith and Mokwena (cited by Zinn & Dintwe, 2015:154) point out that a primer residue test can recover residue from the hands of the person who fired the shot, someone who was in close proximity to the discharged weapon, and objects or clothing within a three-metre radius from the shooter. Since primer residue can easily be destroyed by simply washing the surface, rubbing hands against material or handling items, Manamela et al. (cited by Zinn & Dintwe, 2015:154) recommend that primer residue be taken within two and a half hours from the time of shooting.

Chisum and Turvey (2007:140) emphasise the importance of proper documentation and management of the crime scene, since trace evidence such as gunpowder found on both suspect and victim suggests contact, in accordance with Locard's principle.

2.8 SEROLOGICAL EVIDENCE AT THE CRIME SCENE

Serological evidence means that bodily substances such as blood, semen, and sweat can be used as evidence to identify the perpetrator during criminal and civil investigation and prosecution (Manamela et al., cited by Zinn & Dintwe, 2015:97).

Gilbert (2010:95) acknowledges that a crime scene can be staged, and inconsistencies and contradictions become apparent during crime scene processing. Innes (2003:27) points to cases of murder that have been made to look like suicide. In cases where murder crime scenes have been tampered with to conceal evidence, the crime scene investigator relies on information and a gut feeling. Layman (2013:253) similarly acknowledges that some criminals try to cover up their crimes. Dutelle (2005:28) believes that crime scene investigators need to possess certain attributes, including intuition and an eye for detail. A crime scene is viewed as having significant value in providing the officer with suspect-

tracing information (Gilbert, 2010:148). Pepper (2005:39) reckons that examinations made at scenes that reveal trace evidence can lead to not only the detection of one crime, but also the linking of a number of different offences.

According to Monckton-Smith et al. (2013:101), forensic science can most notably be used to implicate offenders, but it is also crucial in offence linkage. The significance of efficient murder crime scene processing bears fruit during the analysis of evidence and giving of evidence in court. According to Orthmann and Hess (2013:137), physical evidence is of value only if a strict protocol is followed in order to ensure that the evidence may be used during a trial. Orthmann and Hess propose that the following steps should be followed to guarantee admissibility of evidence in court: (1) identify the evidence as that found at the crime scene; (2) describe precisely where it was found; (3) establish its custody from discovery to the present; and (4) voluntarily explain any shifts that have occurred in the evidence.

According to Eckert (1997:46), the examination and analysis of physical evidence by the forensic scientist includes the physical or chemical identification of materials to the highest degree of scientific certainty possible with current technology. For example, the examination and analysis of other kinds of physical evidence, such as blood and hair, may lead to identification of a material, followed by comparisons with known and unknown specimens to determine whether they share a common origin. Unique or distinct characteristics associated with physical evidence comparisons include corresponding friction ridge detail with fingerprints and individual wear patterns associated with tool marks or footwear. Birzer and Roberson (2012:84) view a quintessential goal of investigations involving crimes against property and persons as establishing a linkage between these factors through physical evidence, which assists the investigator in assessing the evidential value of articles of potential physical evidence; that is, whether an item tends to prove a fact in question or helps in the investigation.

2.8.1 Epithelial Cells

Goodwin, Linacre and Hadi (2007:21) asserts that DNA can be found in blood, semen, saliva, dandruff, clothing, cigarette butts, drinking vessels, food, urine, vomit and faeces, as well as epithelial cells, which are shed skin cells and touch DNA. Similarly, Houck and Siegel (2010:244) identify blood, semen, saliva and urine as body fluids that can identify a

person, because they contain DNA. Saliva can be evidence in a number of crime scenes, can be found on bite marks, licked adhesives, eating and drink surfaces. Even expectoration (spitting) can yield important DNA evidence because saliva has large amounts of skin cells (epithelial cells) from the internal cheek walls. Fisher and Fisher (2012:211) assert that high-sensitivity DNA testing is used to recover and detect small amounts of DNA which is swabbed from, for example, handles of weapons, tools, keys, pens, airbags, door handles, touched clothing and objects used for binding.

The SAPS Forensic Fact File (SAPS, 2011c:2) advises crime scene technicians to collect samples from places suspects are likely to have touched. Bumbrah (2015) emphasises the importance of swabbing for touch DNA when collecting samples from firearms, pointing out that fingerprints do not give positive results in most cases, compared to DNA, although the identification outcome is equal. Similarly, Bond (2008) recommends the use of touch DNA kits to collect samples from firearms, based on the research done by the Metropolitan Police agency, where evidence collected by swabbing was found to be more successful than fingerprints found positive. Crime scene investigators should be trained to differentiate between different evidence collection kits for collection of DNA evidence from suspects, victims and crime scene surfaces.

2.8.2 Hair

Manamela et al. (cited by Zinn & Dintwe, 2015:76) emphasise the importance of collecting hair at the crime scene. Goodwin et al. (2007:17) recognise that hairs are naturally shed or can be dragged out through physical contact and can be recovered from crime scenes. These authors point to the fact that hair can identify the race and ethnic group of a person. Although DNA is found on the root or bulb of the hair, these authors encourage crime scene technicians to collect hair even if it is only a shaft of a hair, as some laboratories can do mitochondrial DNA analysis on the hair. These authors further state that collection of hair from the crime scene might be done with tweezers, tape lift, combing or brushing.

2.8.3 Blood

Goodwin et al. (2007:17) point out that the biological material encountered most frequently at scenes of crime is blood. They further put emphasis on the importance of wearing protective clothing when handling blood-containing exhibits, as inappropriate handling of

the evidence can have grave consequences – it can cause cross-contamination, lead to sample degradation, and prevent or confuse the interpretation of evidence.

Not all red stains at murder scenes are blood; therefore, Dutelle (2014:234) points out that presumptive tests such as Luminol, phenolphthalein, tetramethylbenzidine, LuecoCrystalViolet (LCV), Hemastix, Hemident and Bluestar which indicate, but are not specific for, identification of blood should be used. According to Pepper (2005:62), there are a number of presumptive blood testing kits available to distinguish apparent blood from other sources of red stains. Pepper further states that, once the presumptive blood test has demonstrated that the sample is likely to be blood, the sample must be recovered. From the researcher's experience, a presumptive test on red spots found on crime scenes should be used before collection to determine the presence of blood, along with confirmation tests to determine that it is human blood. The results of the tests should be recorded by means of a photograph before the actual collection of the blood.

Efficient crime scene processing has yielded favourable results, for example, in *State vs Zakayo Kimeze.* Although the crime scene was cleaned up, the forensic investigators used Luminol to examine the scene for traces of blood in order to determine whether murder took place inside the house or not. A footprint was discovered during this examination, which later linked a suspect to the crime scene. Luminol is described by Orthmann and Hess (2013:155) as an easy-to-apply, water-based solution sprayed from a pump bottle over an area where blood traces are suspected. It does not harm DNA in blood and can detect blood that has been diluted as much as 10 000 times.

Dutelle (2014:246) lists the following steps to collect blood when fluid blood is present:

(1) wear gloves, mask and eye protection while soaking up samples;
(2) soak suspected blood onto the swab;
(3) collect the stain until it is completely collected;
(4) make sure to avoid contamination;
(5) allow the swab to thoroughly air-dry;
(6) package swab in a paper container; and
(7) properly label and seal the container.

Dutelle also mentions steps to deal with dry blood – although they are the same as for wet blood, the swabs have to be moistened first.

SAPS Standard Operating Procedures (SAPS, 2014c) instruct crime scene investigators to:

- always wear protective clothing;
- do a presumptive test when processing blood suspected evidence;
- use swabs by either soaking blood into a swab or moistening the swab with sterile water and swabbing the area with suspected dry blood;
- swab onto the stain until it has been completely collected;
- air-dry the swab;
- always avoid contamination and package swabs separately;
- package swabs in a swabbing kit; and
- properly label and seal the swabbing kit.

Furthermore, SAPS Policy 5 of 2003 emphasises the capturing of each and every activity of the process. Photographs with a measuring unit yield good results during analysis of physical evidence. According to Nordby (2013:547), an event may explain bloodstains if the stains are measured to determine their pattern, relationships, or points of origin. Gilbert (2010:285) also states that the crime scene should be photographed carefully, with all bloodstain patterns recorded in distant and close-up photos.

According to Horswell (2004:58), a variety of bloodstains found at crime scenes must be photographed perpendicularly in order to be interpreted to assist in the determination of the sequence of events and a variety of samples taken as one set of stains or more may belong to the suspect. Similarly, Bevel and Gardner (2001:1) state that bloodstain pattern analysis seeks to explain the facts surrounding some incident that is in question. The examination of the physical nature of bloodstains provides information about the events that happened throughout the incident. Dispersion, shape characteristics, capacity, pattern, the amount and mass of bloodstains, and their association to the surrounding scene are the deciding factors during analysis of blood stains found at murder crime scenes.

2.9 SUMMARY

Proper management of the crime scene is crucial in forensic investigation and during crime scene management. Crime scene management always starts with the first member at the crime scene, who should preserve lives, remove perpetrators, identify witnesses, and act according to the knowledge that a less disturbed crime scene assists the court of law to reach

the correct decision pertaining a criminal case. All stages of crime scene management, which are: control; handing over to crime scene manager and technician; planning; investigation and processing; debriefing; restoring; releasing; and evaluation, should be thoroughly explored to ensure that the crime scene is secured and thoroughly searched, and that evidence is correctly identified, collected and packaged.

Cordoning off the crime scene is the responsibility of the first member, but it is the investigation team's responsibility to ensure that the crime scene remains cordoned. This shows that every role player in the police department should ensure that the integrity of the crime scene is maintained. The crime scene processing team should ensure that every member entering the crime scene wears PPE to avoid further contamination and to protect the members against certain diseases. During crime scene processing, the crime scene must be documented through videography, photography, sketches, filling of scene reports. The crime scene should be captured as found and re-photographed with exhibit markers. Overall, medium-range and close-up photographs of the exhibits should be taken. Investigators should consider everything at the crime scene as important and should take photographs of everything since it might come in question in court after an extended period.

Physical evidence should be collected, labelled and packaged, and continuity of possession should be maintained according to legal directives in order to sustain the exhibit's evidential value. Continuous training and communication among role players are emphasised, as criminal investigation involves more than one unit.

The Locard principle states that every contact leaves a trace. Murder crime scenes bear a great deal of trace evidence, such as DNA, ballistic and imprint evidence, bite marks, tool marks, and blood spatters. Imprint evidence can be the result of hands pressed against an object, shoe imprints, footprints, marks caused by gloves and tyre tracks. Depending on the surface, tyre tracks and shoeprints can be cast in order to capture the image, but this should never be done with fingerprints, as the practice will jeopardise the integrity of the finger-, palm- or footprint. Policies, standard operating procedures and legislation that regulate the collection, packaging and analysis of evidence should always be followed, as evidence collected from the crime scene is for court purposes and must not be tampered with during the investigation.

DNA can be found in blood, semen, saliva, dandruff, clothing, cigarette butts, drinking vessels, food, urine, vomit and faeces. Crime scene examiners are encouraged to use an UV light to examine dead bodies for bite marks that should be swabbed for DNA, since they may contain saliva, and be photographed with a scale of reference. Ballistic evidence includes firearms, spent cartridges, fired bullets and gunshot residue. Firearms, spent cartridges and fired bullets should be swabbed for DNA, packaged separately, and sent to the forensic laboratory for firing pin analysis, imperfections on breech, grooves inside the barrel scratch the bullet in a unique way, ejector mechanism marks, and gunshot residue which can spray on the hands and clothes of the shooter, linking the shooter to the gun. Crime scene investigators should be in a position to differentiate between kits to be used to package DNA evidence, including touch DNA, as kits are specific. Physical evidence should be collected, labelled and packaged, and continuity of possession should be maintained according to legal directives in order to sustain the exhibit's evidential value. Continuous training and communication among role players are emphasised, as criminal investigation involves more than one unit.

CHAPTER 3 FINDINGS AND RECOMMENDATIONS

3.1 INTRODUCTION

This study explored the significance of efficient crime scene processing in murder investigations at the Nyanga SAPS cluster. The study described crime scene management and processing to determine the importance of efficient processing of murder scenes. This chapter summarises the dissertation from Chapter 1 to Chapter 2, after which the findings are presented and recommendations are made based on the findings discussed in Chapter 2.

3.2 SUMMARY

Chapter 1 presented a general orientation of the study. The chapter started with the identification and confirmation of the identified research problem. Arising from the identified research problem, the aim, purpose and research question of this study were presented.

The aim of this study was:

- To explore the significance of efficient crime scene processing during murder investigations.

The purpose of this study was:

- To explore, identify and describe the correct procedures that should be followed during crime scene processing during murder investigations in order to emphasise the significance of efficient crime scene processing.
- To efficiently understand efficient crime scene processing in murder investigations by exploring existing practices together with the national and international literature, and to make this information (findings) available to the investigation officers and crime scene processing investigators.
- To reach recommendations for best practices to be followed at murder crime scenes based on the results of the data analysis that would address the research problem and could enhance the investigation skills of murder investigators.

Subsequently, the following primary research question was explored:

- What is the significance of efficient crime scene processing in murder investigations?

The chosen target population and sample for this study were illustrated and their inclusion motivated, followed by a presentation of the research methodology drawn on in this study. This chapter ended with an outline of the indicators considered to ensure trustworthiness, as well as the ethical considerations of the study.

Chapter 2 provided an overview of crime scene management and processing. The chapter began with a discussion of crime scene management and its accompanying phases. The chapter then presented a discussion of crime scene processing, including the collection and documentation of physical evidence gathered at the crime scene. The findings resulting from the semi-structured interviews were presented and incorporated into a discussion of the relevant literature on crime scene management and crime scene processing.

3.3 RECOMMENDATIONS RESULTING FROM THE FINDINGS

The findings of this study, as illustrated in Chapter 2, call for recommendations on how to more efficiently address procedures that should be followed during crime scene processing of murder scenes to improve the understanding of efficient crime scene processing in murder investigations, as well as best practices to follow at murder crime scenes. These recommendations are centred on the answers received from participants, and are focused on the significance of efficient crime scene processing in murder investigations.

The research indicates that sufficient SAPS regulatory policies and procedures exist that provide clear guidance to crime scene experts and investigating officers on how to efficiently process and manage a murder scene. However, participants' understanding of crime scene management was limited to certain aspects of crime scene management. The underutilisation of crime scene experts to process murder scenes is further identified as a shortcoming. Although the majority of participants were familiar with the required procedures to process a crime scene, the execution of these procedures was often not performed by the responsible crime scene experts or not done to the satisfaction of investigating officers. The significance of efficient crime scene processing is thus not realised among the majority crime scene experts and investigating officers, with a significant impact on efficient crime scene processing at the Nyanga SAPS cluster in the Western Cape.

Established from the findings of this study, recommendations on crime scene management and crime scene processing are presented below.

3.3.1 Recommendations on Crime Scene Management

Crime scene experts and investigating officers in the Nyanga SAPS cluster should continuously be sensitised to the contents of SAPS National Instruction 1 of 2015 by means of training interventions. This will empower these experts and investigators with essential knowledge and skills regarding the efficient planning and implementation of crime scene management processes.

As a result, these individuals' understanding of crime scene management would be enhanced. Crime scene experts and investigating officers should become increasingly acquainted with the procedures to:

- take control and secure the crime scene;
- ensure the integrity and the originality of evidence and exhibits;
- explore and process the crime scene comprehensively and undisturbed;
- coordinate and maximise the collection of exhibits;
- utilise investigation support resources, such as crime scene experts, optimally;
- record facts and events properly; and
- guarantee that the crime scene remains under police guard for the period determined by the crime scene manager.

3.3.2 Recommendations on Crime Scene Processing

- Crime scene investigators at the Nyanga SAPS cluster should become increasingly familiar with the required SAPS procedures to process a murder scene efficiently. These investigators should follow the correct procedures to process a murder scene in order to correctly recognise physical evidence, document its locality through sketches and photographs, gather it, and mark and package it. Crime scene investigators should ensure that the chain of custody is maintained during all stages of handling the evidence. In addition, a competence assessment should be performed among investigating officers at the SAPS in the Nyanga policing cluster, to determine the challenges and limitations experienced during the processing of murder scenes. Based on the outcome of this competence assessment, a tactical competence enhancement strategy should be implemented.

- The human and physical resource capacity of crime scene experts should be increased in the Nyanga SAPS cluster to ensure that the large number of murder scenes are efficiently processed. Sufficient human and physical resources would ensure that murder scenes are processed according to SAPS regulations. Consequently, crime scene experts would be in a position to process all murder scenes without the time constraints caused by insufficient human resources.

- Communication between crime scene experts and investigating officers should be improved to facilitate better relationships and cooperation between them. Moreover, it is recommended that constant communication and consultative decision-making between crime scene experts and investigating officers should be put into practice to improve crime scene processing.

- Awareness of efficient murder scene processing should be created constantly among crime scene investigators and support units at the Nyanga SAPS cluster. Crime scene managers should implement strategies to improve the processing of murder scenes.

3.4 CONCLUSION

The research presented in this study points to the significance of efficient crime scene processing. The significance of efficient crime scene processing is presented and acknowledged by the results of this study. The reviewed literature presents the importance of crime scene processing in the investigation of murder. However, the results of the interviews conducted propose that investigators and crime scene experts at the Nyanga SAPS policing cluster experience shortcomings with regard to efficiently processing murder scenes. The research question, namely, *What is the significance of efficient crime scene processing in murder investigation?* was adequately addressed. Should the Nyanga SAPS cluster implement the suggested recommendations made in this study, murder scenes would be more efficiently processed.

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APPENDIXES

APPENDIX A: SOUTH AFRICAN POLICE SERVICE LETTER OF APPROVAL

South African Police Service South African Police Service

Private Bag X322 Fax No: 012 421-0401

Your reference: 3/34/2
My reference:
Enquiries: AC MP Ramphele
Tel: (012) 421-0204

THE DIVISIONAL COMMISSIONER
FORENSIC SERVICES
PRETORIA
0001

The Head
STRATEGIC MANAGEMENT

RE: RESEARCH PROPOSAL: THE SIGNIFICANCE OF MURDER CRIME SCENE PROCESSING; MASTERS DEGREE: UNISA: RESEARCHER: NK JOBELA

1. Your communiqué with reference 3/34/2 dated 13 June 2014 bears reference.

2. Approval is hereby granted to the above-mentioned request, provided that the applicable directives on conducting research are adhered to.

Kind Regards

LIEUTENANT GENERAL
DIVISIONAL COMMISSIONER: FORENSIC SERVICES
JK PHAHLANE

DATE: 2015 -07- 13

APPENDIX B: UNIVERSITY OF SOUTH AFRICA ETHICS APPROVAL

UNISA

COLLEGE OF LAW RESEARCH ETHICS REVIEW COMMITTEE

Date: 2015-06-25

Reference: ST 86

Applicant: N K Jobela

Dear N K Jobela

DECISION: ETHICS APPROVAL

Name	N K Jobela
Proposal	The significance of murder crime scene policing
Qualification	MTech

Thank you for the application for research ethics clearance by the College of Law Research Ethics Review Committee for the above mentioned research. **Final approval is granted.**

The application was reviewed in compliance with the Unisa Policy on Research Ethics.

The proposed research may now commence with the proviso that:

1. *The researcher will ensure that the research project adheres to the values and principles expressed in the Unisa Policy on Research Ethics which can be found at the following website:*

   http://www.unisa.ac.za/cmsys/staff/contents/departments/res_policies/docs/Policy_Research%20Ethics_rev%20app%20Council_22.06.2012.pdf

2. *Any adverse circumstances arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the College of Law Ethical Review Committee.*

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392, Unisa, 0003, South Africa

APPENDIX C: CONFIRMATION OF PROOFREADING

Susanna Elizabeth Louw
Phone 076 588 8561
Email anzelle@wordfix.co.za
SATI membership number 1002866

EDITING DECLARATION

DATE: 25/09/2018

I, SE Louw, hereby declare that the dissertation titled ***The significance of efficient murder crime scene processing***, with the exception of verbatim quotes, has been professionally language edited by me.

If further information is required, please contact me.

SE Louw 2018-09-25
Susanna Elizabeth Louw Date