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USAGE OF DIGITAL PHOTOGRAPHS IN FORENSIC WORK IN SRI LANKA

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ABSTRACT

Forensic photography refers to making of images to record objects, scenes and events to be used in the legal process. With popularization of digital cameras, forensic photography is being increasingly used as a tool in record keeping as well as evidence. The objective of this study was to evaluate available facilities and current practice of using digital photographs in forensic work by medico-legal doctors in Sri Lanka. A cross sectional descriptive study was conducted using a self-administered questionnaire among doctors engaged in forensic work in Sri Lanka. The study was conducted as an on-line survey from October 2018. Out of 102 doctors who participated in the survey, 51% (n=52) used camera-phones instead of DSLR cameras to take forensic photographs, although 72% (73) had a DSLR camera in the institution. The majority (96%) used a measuring scale in their photographs, but only 43% used a colour scale. 66% took more than two photographs for a single injury but only 26% used an external light source. 80% took photographs in all magisterial autopsies but only 48% incorporated them in their reports. Majority (74%) knew that forensic photographs are admissible in courts. Basic technical knowledge of functions of a camera was poor in a majority (85%) of doctors. Although basic technical knowledge of photography was poor in doctors engaged in medicolegal practice, many use photographs to compliment autopsy reports. Since comprehension of events using visual images is better than verbal descriptions, improving the quality of photographs submitted to courts should be the way forward. Therefore, forensic photography training should be encouraged.

Key words: Digital Photography; Practice; Medico-Legal Doctors; Sri Lanka



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INTRODUCTION

Forensic photography refers to making of images to record objects, scenes and events to be used in the legal process. Forensic photographs may be taken specifically for documentation, analysis, intelligence as a part of the process of evidence collecting or for court presentations.¹ Therefore, the photographs must be accurate and detailed, and of use in court. The photographer not only should have an understanding of the technical requirements but also the related medical and legal requirements.²

Autopsy photography causes minimum delay to the autopsy. It is also extremely reliable, as images are not repeatable.² At the scene of crime it will produce an accurate reproduction of the crime scene which provides the benefit to the court.³ A photograph can transfer more information than subjective descriptions, which are open to misinterpretation.⁴ Therefore, judges and lawyers will get clear understanding regarding the situation or the condition to arrive at a correct conclusion.

Photography is used in virtually every aspect in the forensic field. Crime scene recording, recording of injuries, identification, interpretation of injuries and detecting clandestine grave sites are few.^{5,6} In many parts of the world, forensic photography is a part of police investigation conducted by trained police officers/ trained photographers. However, it is not uncommon to see many forensic medicine experts develop skills of taking photographs related to injuries of living and dead as part of the job, because it is accepted tool of better record keeping. Therefore, the doctor who conducts the postmortem or the clinical examination to take necessary forensic photographs by him or herself has been the common practice in Sri Lanka.

Forensic photography requires a combination of easily portable equipment and additional technical support which is necessary to minimize distortion and

misleading information.² Further data need to be stored in a manner that are easily retrievable. In this digital era, smartphones have become an essential in person's life because of its multi-purpose use. Therefore, phone cameras are being increasingly used by people and forensic doctors have not escaped the trend. Thus forensic photos by cameras are being increasingly replaced with those from smart phone cameras.

OBJECTIVE

To evaluate available facilities and current practice of using digital photographs in forensic work by medico-legal doctors in Sri Lanka.

METHODOLOGY

A cross sectional descriptive study was conducted using a self-administered questionnaire among doctors who engage in forensic work in all provinces of Sri Lanka. The study was conducted mainly as an on-line survey from October 2018, using a Google form. However, to capture doctors who are not internet user's a postal survey was also employed. Ethical clearance to conduct the study was obtained from the Ethical Review Committee- DGH Trincomalee, Eastern Province.

RESULTS

Out of 102 doctors who participated the survey 52% (n=53,) were Medical Officers Medico-legal in the country with basic medical degree, while the rest were those with postgraduate qualifications. There were 27% Board Certified specialists in Forensic Medicine attached to the Ministry of Health and Departments of Forensic Medicine of state universities. Majority were males (n= 81, 80%) with less than 5 years of experience (62%) in the medico-legal field while 45% (n=46) were from base hospitals. There were 35% from the Western Province while 15% were from Southern and 13% from the Central Province.

The analysis of the type of the camera used to take forensic photographs revealed that just above half of the sample used a phone camera while 39% used a digital SLR camera (Table 1).

Table 1: Type of camera used most to take forensic photographs

Type of camera	Frequency	Percentage
Digital SLR	39	38
Camera phones	52	51
Non DSLR	11	11
Total	102	100

Although half of the doctors used camera phones to take forensic photographs, majority (71% n= 73) had a DSLR camera in their institutions. Further, 26% used an external light source to take photographs. Analysis of basic features of the forensic photographs revealed that although 96% of doctors incooperated a measuring scale in the forensic photographs only 43% used a colour scale. Two thirds of our sample took more than two photograph to document a single injury (Table 2) while 70% used a flexible measuring tape.

Table 2: Number of photos taken on a single injury

Number of photos taken on a single injury	Frequency	Percentage
One	6	5
Two	30	30
More than two	66	65
Total	102	100

Forensic photography includes autopsy photographs as well as photographs related to injuries of the living. Analysis of the practice of forensic photography revealed that 84% of doctors take forensic photographs related to clinical situations

while 28% take only whenever it is necessary. However, 28% (n=29) of them take photographs in all routine autopsies, 68% takes photos whenever necessary. In contrast, 79% (n=81) of doctors take photographs in all magisterial postmortem (Table 3).

Table 3: Frequency of taking photographs in magisterial autopsies.

Photographs in magisterial autopsies	Frequency	Percentage
Never	2	2
Sometimes	1	1
Occasionally	1	1
Whenever necessary	17	17
All cases	81	79
Total	102	100

96% of doctors stated that the reason to take forensic photographs is for recording injuries for later usage. 48% (n=49) of doctors incooperated photos in their reports. 74 % (n=74) agrees that annexed printed photographs along with reports are admissible in the courts. Out of 102 doctors only 27% had a formal knowledge of photography, therefore it is no surprise to see that only 15% gave correct answers to the questions regarding the basic technical knowledge of a camera function.

DISCUSSION

Forensic photography is a unique discipline conducted by trained people mostly in the police or investigative services in many parts of the world. They use sophisticated camera and light sources with the main objective of producing them as evidence in a court of law. In developed countries forensic photographs especially those of injuries taken by police are used by the pathologists to describe the injuries to the courts for better comprehension. Even though such a practice is not seen in Sri Lanka, use as complimentary to the

description of injuries has been practiced by many doctors over the years. Except the two institutions designated professional forensic photographers are not found in Sri Lankan Hospitals where medico-legal services are provided. Therefore, forensic doctors tend to take their own photographs both in the living and dead with their limited capabilities. The trend seems increasing with young doctors coming to the field more.

Forensic photographs almost always need the clarity and sharpness, since it is used to generate comprehension of an injury in another person's mind. For a sharp quality photograph, a high end camera is needed. The study showed that most doctors (51%) prefer to use camera phones instead of DSLR to take their forensic photos even though majority (72% n=73) stated that they have a DSLR camera in their institution. This finding clearly shows that use of DSLR camera is largely replaced by camera phone nowadays. Although we have not addressed the reason for the preference of the camera phone by the doctors in this study we clearly understand the user friendliness coupled with availability as well as its ability to generate fairly good quality photographs may be the reason. Moreover, these cameras are easily operable by anyone, because they have inbuilt auto-focusing ability, as well as many enhancing features. Further, the facility to delete poor quality photographs may be another reason for the preference. Therefore, this phenomenon needs further study.

All forensic photos should include the entire piece of evidence and a scale to indicate size.⁷ It is important to use colour scale in forensic photographs in order to determine the true colour of the injury, which may give evidence of timing.⁸ According to our study, almost all doctors (96%) use measuring scale in their forensic photographs. In contrast only 43% used a colour scale. Therefore, incorporating a colour scale in forensic photography should be emphasized more if we use them more frequently for injury interpretation. Another technical

aspect of forensic photography especially on injury interpretation is the number of photos taken of a single injury. This is very important to get a comprehensive idea, especially from different distances. Further, the close up photographs may tell more details. This study showed that 66% took more than two photographs for a single injury showing that the majority understood the relevance.

Flashes as an external light source make it easy and quick to take photos in digital photography. It is also demonstrated with other applications like de-noising, white balance and removal of red eye can synthesize new images that are of higher quality than originals.⁹ According to the study, 83% of institutes in Sri Lanka did not have external light sources. This could be the reason why most doctors (74%) never use external light source while taking their photographs.

Most doctors (74%) who participated in the study agreed, that printed forensic photographs are admissible in the court of law. Although 80% took photographs in all magisterial autopsies only 48% incorporated the photos in their reports. The reasons may be multiple; such as not having enough funds to print them to having the notion of including photographs causing unnecessary questioning from the defense. Thus, this too needs further evaluation as well as research.

Exposure is the process of recording light on to the digital sensor. It is controlled by the aperture setting (size of the hole which allows light to pass through), speed of the shutter and sensitivity of the camera sensor. These three settings are called exposure triangle.¹⁰ The understanding of exposure triangle is important. Optimally exposed images give more detail than over- or underexposure images.¹¹ In this study only 14% knew the exposure triangle correctly.

Another area that we studied was the understanding of the image quality. A

camera with a larger sensor will produce sharp images with less noise. Therefore, size of the sensor is a matter for a better quality image.¹² With a small sensor, the pixels can't capture as much light, so a pocket camera will produce images that have less dynamic range and never as clean as a DSLR. The study showed only 15% knows that the sensor size is the most important factor for a better quality photograph. Therefore, above findings of the study were compatible with poor basic technical knowledge of a camera function among forensic doctors and need to be addressed.

CONCLUSION

Although basic technical knowledge of photography was poor in forensic doctors, increasingly many used photographs to compliment autopsy reports. Since comprehensions of events using visual images are better than verbal descriptions, improving the quality of photographs submitted to courts should be the way forward. Therefore, forensic photography training should be encouraged.

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