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Integration of medical visual documentation into medical education, benefits for medicine, education and treatment

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ABSTRACT

Objective: Medical visual documentation is an important part of medical education. It provides numerous benefits to both. This article argues for the integration of medical photography into medical education.

Material and Methods: A medical visualization and documentation elective course was offered to second-year students at the Kocaeli University Faculty of Medicine. At the end of the 14-week program, a questionnaire was administered to students who participated in the course. The survey results were analyzed using data analysis programs.

Results: According to the survey results, the students stated that the elective course positively impacted their education and experience as future doctors.

Discussion: In many medical schools, both in Turkey and around the world, medical photography training is not integrated into medical education. This presents challenges for medical education and physicians. However, these difficulties can be overcome by providing integrated training and courses for doctors.

Keywords: Cancer, general surgery, laparotomy

INTRODUCTION

The term ""photography"" literally means ""writing with light"". This expression was first used by Sir John Frederick William Herschel. Photography is an art form that captures and preserves moments, reality, and subjects against the passage of time since its emergence. Medical photography, which results from the combination of medicine (a branch of science) and photography, not only ensures permanence but is also utilized in many areas of the health sector. In this utilization process, attention should be given to patient privacy and ethical rules, technical details of photography, and the storage and sharing of photographs in medical visual documentation. The teaching of these terms is one of the issues that should receive greater emphasis in today's medical education (1,2).

Medical photography has developed alongside general photography. The advent of photography, which began approximately two centuries ago with Joseph Nicéphore Niépce, was introduced into medicine through the efforts of individuals such as Simon Peter Hullihen, Hugh Welch Diamond, and Auguste Nelaton, marking the first steps in medical photography (3).

Medical visual documentation has important applications in the healthcare sector. It is used in many areas, such as diagnosis of disease and monitoring of the treatment process; measuring the success of procedures by photographing surgical sites before and after procedures; documenting the stages of surgical procedures and removed body parts (e.g., tissues, organs, limbs); and creating a patient archive (1).

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One area of application that we consider important and will particularly emphasize is its use in education and training for future physicians. Visual materials play a crucial role in medical education. Visual explanations of diseases and surgical techniques contribute substantially to medical students" education. It provides students with an encouraging, creative, memorable, and motivating learning environment. It enables medical students to gain insights into cases or situations they do not encounter in practice through visual elements. It plays an essential role in improving their diagnostic performance and self-confidence in their clinical knowledge (4).

Photographs used in medical research and publications enable information to be presented more clearly and comprehensively. They play an important role in facilitating knowledge transfer between doctors and researchers (1).

In medical visual documentation, images should be obtained in accordance with patient privacy and ethical guidelines. The doctor must obtain informed consent from the patient before taking the photograph (1).

During the consent process, the patient should be informed about the risks to patient privacy and the purposes for which the photograph will be used. Individual permission must be obtained for each specific purpose. While taking the photograph, the doctor should avoid any identifying features that may disclose the patient's identity and should obtain consent by showing the photograph to the patient (5-7).

The storage and sharing of photographs are also included in the ethical discussion. Both the doctor and the institution have a role in storing the photograph. It is necessary to ensure the privacy of photographs shared to exchange treatment-related ideas among doctors (6).

However, this situation should not be forgotten. The patients whose photographs have been taken have the right to withdraw their consent to the photographic session at any time. In this case, issues may arise concerning the use of the photograph (8).

As in general photography, certain elements should be considered in medical photography. It is important in both photography and medicine that photographs are taken properly and accurately convey their content. Photographs should be taken for medical rather than aesthetic reasons (9,10).

Many materials can be photographed in medical visual documentation. To capture these materials with sufficient quality, basic knowledge of photography is required, but need not be extensive. With advances in technology, photographs can be captured using a variety of devices. Specialized programs have been developed to take high-quality medical photos with smartphones. The photograph should be of high quality and convey the information it contains clearly and accurately. To this end, basic photography principles such as lighting, background, appropriate device settings for the material, and use of supporting elements should be applied (9-11).

Although these details regarding medical visual documentation may seem insignificant, they are crucial for performing this task appropriately and to a high standard. Education should be standardized.

In summary, although medical visual documentation is used in many areas of medicine and the health sector, its importance has not been recognized. Universities and organizations in our country and around the world do not pay sufficient attention to this issue. Many doctors do not have sufficient knowledge of this subject, and consequently, problems related to medical visual documentation may arise.

This study argues that these deficiencies in educational systems should be addressed and medical visual documentation should be integrated into curricula.

MATERIAL and METHODS

A medical visual documentation unit and a studio affiliated with this unit were established within the Kocaeli University Faculty of Medicine in 2015. Since its establishment, it has offered the elective course named "Medical Visual and Documentation" annually to a certain number of students. In addition, since 2015, a one-hour compulsory course has been offered to 1st and 2nd-year students. The unit and the course program, which are developed every year, contribute to doctor candidates" knowledge of medical visual documentation.

In 2024, eight students enrolled in this elective course, which is offered annually. The course was held weekly for 14 weeks. The medical section of the courses was taught by Sertaç Ata Güler, a faculty member of the Department of General Surgery, and the photography section was taught by Osman Demir, a faculty member of the Department of Photography, Faculty of Fine Arts, Kocaeli University. In the courses, topics such as the history of photography, notable photographers, the basics of photography, photographic technologies, various cameras, and portraits were discussed. Additionally, topics such as applying these concepts to medical visual documentation, its key aspects, and techniques for medical photography were covered. In addition to the classes, museum visits, photographic analyses, and medical photography practice were conducted. During the museum tour class, the Photography Technologies Museum at the Kocaeli SEKA Paper Museum was visited and examined together with Osman Demir and Sertaç Ata Güler. During medical photography practice, students were divided into groups. Using mobile phones and different type of cameras, students

practiced photographing tissues removed during surgery. As the end-of-course evaluation, a photo exhibition of student photographs taken during practical lessons was organized (Table 1).

At the end of the 14-week schedule, data were to be obtained by conducting a survey of the students regarding the adequacy of the course and the syllabus revised in the 2023-2024 academic year. In the survey, participants were asked about the course, curriculum, photography, and medical visual documentation, and they were requested to indicate how much they agreed with these statements. Finally, students were asked to write their general opinions about the course.

The study protocol was reviewed and approved by the Ethics Committee of Kocaeli University (approval number: 2025/189, date: 14.04.2025).

Statistical Analysis

Statistical evaluation was performed with IBM SPSS 29.0 (IBM Corp., Armonk, NY, USA). Compliance with the normal distribution was examined using Shapiro–Wilk test. Because the assumption of normality was not met, continuous variables were presented as median (25^{th}-75^{th} percentiles). Categorical variables were reported as frequencies and percentages.

RESULTS

According to the survey results, most students had not received any photography training prior to the course. There were no meaningful data to indicate that they had sufficient knowledge of photography or medical visual documentation. All the students used cell phones while taking photos, meantime 2 students had digital cameras (Table 2).

According to the results, students agreed that after the course they had gained more knowledge about Medical Visual Documentation. The students also mostly agreed that the syllabus was sufficient in terms of both theory and practice.

In their general views regarding the course, the students expressed that museum tours, interactive lessons, an exhibition that touched on other aspects of photography, and the presence of a faculty member from the faculty of visual arts had positively affected the course and its program.

Table 1. The 14-week syllabus of the medical visual documentation elective course

Weeks	Faculty member	Course content
Week 1	Faculty Member of Faculty of Medicine	Meeting of faculty members and students, giving information about the content of the course.
Week 2	Faculty Member of Faculty of Fine Arts, Department of Photography	The structurality of photography.
Week 3	Faculty Member of Faculty of Fine Arts, Department of Photography	Introduction of photographic technologies and simple technical details.
Week 4	Faculty Member of faculty of Fine Arts, Department of Photography	Portrait photography.
Week 5	Faculty Member of Faculty of Medicine Faculty Member of Faculty of Fine Arts, Department of Photography	Visiting a museum, studio or institution about photography.
Week 6	Faculty Member of Faculty of Medicine	Introduction to medical visualization and documentation.
Week 7	Faculty Member of Faculty of Medicine	Ethical and legal issues in medical visual documentation.
Week 8	Faculty Member of Faculty of Medicine	Clinical photography.
Week 9	Faculty Member of Faculty of Medicine	Spesmen shooting.
Week 10	Faculty Member of Faculty of Medicine	Intraoperative photography.
Week 11	Faculty Member of Faculty of Medicine	Medical photography practice in the operating room.
Week 12	Faculty Member of Faculty of Medicine	Medical photography practice in the operating room.
Week 13	Faculty Member of Faculty of Medicine	Medical photography practice in the operating room.
Week 14	Faculty Member of Faculty of Medicine Faculty Member of Faculty of Fine Arts, Department of Photography	Completion and evaluation of the photography project.

Table 2. Results of the survey conducted with students	
	Median (IQR)
Age	21 (19.25-21)
My knowledge of photography is sufficient.	3 (3-3)
My knowledge of medical visual documentation prior to taking the course was sufficient.	2 (1.25-2.75)
This course contributed substantially to my professional development in medical visual documentation.	5 (4-5)
If I had the opportunity, I would choose this elective course again.	4.5 (3.25-5)
The theoretical education in the curriculum is sufficient for medical visual documentation.	4.5 (4-5)
Practical training in the curriculum is sufficient for medical visual documentation.	4 (3-4.75)
After the course, I acquired sufficient knowledge of the medical visual documentation process.	4.5 (4-5)
	n
Term 1/term 2	1/7
Cell phone	8
Digital camera	2
Analog camera	0
Tablet	1
Have you received training in photography?	0
Have you received training in medical visual documentation?	1
IQR: Interquartile range.	

DISCUSSION

The Types of Medical Visual Documentation and Its Challenges

Although medical visual documentation is based on photography, it is not merely about taking photographs. Medical photography has its own procedures, concerns, and reservations.

Specimen photographs are usually taken in the operating room. Throughout the surgical procedure, operating-room rules must be observed. Sterilization must not be compromised in any way; the procedure must be strictly observed, and no obstructive actions are permitted. The photography equipment must be cleaned before and after use to maintain the sterility of the operating room.

There is not always sufficient time to photograph the specimen removed from the patient. The specimen may need to be urgently sent for examination. In this case, the specimen should be photographed and delivered to the relevant unit as soon as possible, without interfering with the operation. A dilemma emerges. The dilemma of limited time and quality. It is difficult to take a high-quality photograph within a limited amount of time. In the operating room, sufficient time and an appropriate setting are required to prepare the workspace for photographing the specimen and to provide adequate lighting. However, the specimen removed during the operation should not be removed from the operating room. Otherwise, concerns such as specimen safety, ethical considerations, and the sterilization of locations and equipment used during sampling could arise. Furthermore, the manner in which the specimen is removed prior to photography is crucial for the photographer to obtain a high-quality image. For the specimen photograph to convey information directly, the photographer must first understand both the specimen and the operation. As the medical visualization and documentation team, we create a frosted-glass background for photographing the specimen in the operating room, thereby highlighting the specimen. For lighting, we photograph using room lighting while remaining outside the operating area and observing sterilization. By observing the operation live, we have the opportunity to assess the specimen. In this way, we aim to accurately determine, according to these details, the shape, position, and problematic parts of the specimen and photograph so that the photograph can convey clear information (Figure 1).

Intraoperative photography is similar to specimen photography. It is similar in many ways, such as sterilization rules, attention to and respect for the operation. The shooting technique is distinctive. The structure to be photographed is not removed. The body area where the operation is performed is referred to as the shooting material. Adequate lighting and an appropriate camera position are required to obtain high-quality photographs of this area. Sterilization should not be interrupted while making these adjustments (Figure 2).

Clinical photography differs from specimen and intraoperative photography in several respects. Clinical photography is more flexible regarding location, sterilization, and timing. The patient to be photographed can be brought to a studio or other location that permits higher-quality photography. It has better conditions regarding lighting, background, shooting position, and the preferred shooting device. An important issue in clinical photography is paying the utmost attention to the privacy of the patient being photographed. In addition, factors that could disturb or overwhelm the patient during the photography session should be avoided, and a comfortable process should be ensured for both the photographer and the person being photographed (Figure 3).

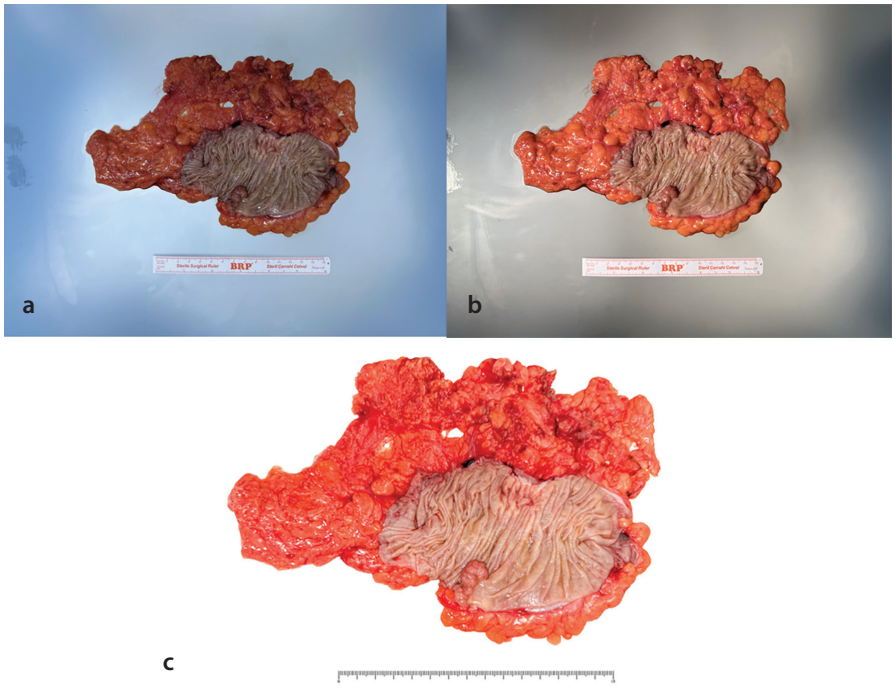

Figure 1. Specimen photographs (a) Shot without proper environmental adjustments. (b) Shot with proper environmental adjustments. (c) Photograph edited with a photo editing program.

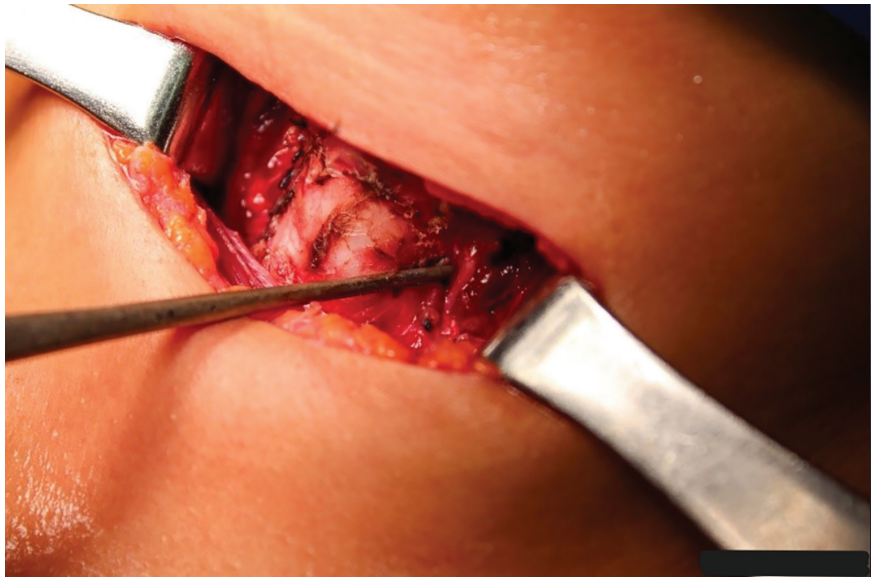

Figure 2. Intraoperative photography.

Figure 3. Clinical photography.

Doctor's Insufficent Knowledge About Medical Visual Documentation

Although today's doctors frequently use medical visual documentation in their professional lives as technology develops, they lack sufficient knowledge about it. Many doctors do not have sufficient knowledge of issues such as obtaining consent for medical visual documentation, sharing, storing, and using the photographs taken (12).

Since doctors do not have sufficient knowledge of photography, they have difficulty taking high-quality photographs and cannot ensure that the photographs fully convey the information. This situation negatively affects many aspects of medical visual documentation, including education, research, artificial intelligence-based disease analysis (13), and information exchange among doctors.

Integrating medical visual documentation training into the medical education curriculum is anticipated to enhance the quality and academic utility of visual records, particularly in clinical settings. Visual documentation, now an essential element of modern medicine, serves as a crucial adjunct to clinical practice, leveraging advancements in technology.

The introduction of specialized photography and videography instruction—supported by the faculty of fine arts' photography department and included alongside foundational medical courses such as anatomy and histology—is designed to equip future physicians with the skills necessary to produce high-quality, academically rigorous visual materials. Such comprehensive educational integration remains uncommon within our country's medical faculties.

It will be very useful in clinical practice, particularly for obtaining physicians" own medical visual documents, collecting additional patient data, and facilitating disease follow-up with high-quality, academically effective medical visual documentation taken by themselves.

Inadequacies in Medical Visual Documentation Education

These problems stem from the insufficient integration of medical visual documentation into medical education. In our country and many other countries, medical visual documentation education has not been integrated into medical curricula but has instead been offered as short-term courses, elective courses, or certificate training programs accessible to a limited number of medical students.

Unfortunately, the subject of "medical visual documentation" continues to receive little attention in our country. A few universities in Türkiye offer course programs on this subject across various faculties. The "medicine and photography" elective courses are offered to term 1 students in the Faculty of Medicine at Aydın Adnan Menderes University. İstanbul Medeniyet University Faculty of Medicine, term 4 students are given an elective internship course called "medical photography".

Another university in our country that conducts this work more professionally is Mersin University. The Continuing Education Application and Research Center at Mersin University offers a certificate program in medical photography, led by Tamer Akça. In addition, a 60-hour elective course in medical photography is offered to term 2 students at Mersin Faculty of Medicine. Additionally, students who choose this course are enrolled in the medical photography certificate program at no charge. However, because the relevant departments could not be contacted, insufficient information is available to determine whether this program is still ongoing.

Although medical visual documentation is uncommon in Türkiye, dental photography is more prevalent and is offered as an elective course at many universities. An elective course titled "medical photography" is offered in various departments of the Faculty of Health Sciences at Fenerbahçe University. It is also offered as an elective course titled "medical photography" at the Faculty of Veterinary Medicine at Tekirdağ Namık Kemal University.

The National Health Service has a more standardized approach to medical visual documentation. They provide training in Medical visual documentation at some universities in the country and are also interested in the professional dimension of its.

Training in Medical Visual Documentation is not integrated into medical education, but the responsible units provide guidance to doctors. To practice medical photography professionally, one should first study photography and then obtain a master's degree in medical photography.

In addition, some health institutions in the country have provided short training sessions in medical photography to health workers and general practitioners, tailored to their needs. They achieved positive results within a short time (13).

As the examples we have mentioned and the research we have conducted show, medical visual documentation is a concept that not only consists of taking photographs but also includes other disciplines. As it is frequently used by doctors and healthcare professionals, it requires a standardized training program and integration into medical faculties. At the same time, this program should consist not only of theoretical courses but also of practical, interpretation, and cultural courses. Doctors should be provided with a photographic and artistic perspective and the ability to take photographs as required for medical photography. In this way, the problems can be prevented. A positive contribution can be made to the professional and educational lives of doctors and doctor candidates. Research, development, investigation, and information-sharing activities in the medical and health sectors can be improved with respect to visual quality.

All faculties of medicine in Türkiye were included in the data analysis that we conducted on medical visual documentation education. An attempt was made to identify courses in medical visual documentation by examining the faculties' websites, course schedules, course contents, and academic calendars. Based on the data obtained, lecturers were contacted to obtain information about their courses; however, not all could be reached. The necessary data could not be obtained from the websites of such medical faculties. In some of them, the website provided no information about the aforementioned elements. Some could not be accessed without permission. Some of them offered courses that could be related to medical visual documentation, but course information was unavailable and they could not be included in the study. While editing the article, some websites were revisited and the information was updated.

Due to the large number of medical faculties worldwide, it was not possible to analyze the websites of all of them. In some of the medical faculty websites analyzed, the necessary data could not be obtained for the same reasons.

CONCLUSION

This article advocates for the systematic incorporation of training in medical visual documentation into medical school curricula and presents our proposed program, developed collaboratively by the medical faculty and the Faculty of Fine Arts. Our pilot data and statistical analysis are based on eight participants. Although this sample size is limited, it reflects the current paucity of medical schools offering such training and therefore precludes a multicenter approach at this stage. Our primary objective is to expand access to this educational module, thereby enabling larger-scale studies and generating more robust results as adoption increases at additional institutions. The sample size from which we collect data is small because there are few other medical faculties where these trainings are offered. However, the absence of other medical faculties offering this education prevents this number from increasing. With the integration of these educational programs into medical faculties over time, it will be possible to perform statistical analyses to evaluate educational outcomes for a larger number of medical students.

Ethics

Ethics Committee Approval: The study protocol was reviewed and approved by the Ethics Committee of Kocaeli University (approval number: 2025/189, date: 14.04.2025).

Informed Consent: Informed consent was obtained from patients for medical visual documents and from the medical school students for the research.

Footnotes

Author Contributions

Concept - S.A.G., S.E.G., Z.İ.Y.; Design - S.A.G., S.E.G., Z.İ.Y.; Data Collection or Processing - S.A.G., S.E.G., Z.İ.Y.; Analysis or Interpretation - S.A.G., S.E.G., Z.İ.Y.; Literature Search - S.A.G., S.E.G., Z.İ.Y.; Writing - S.A.G., S.E.G., Z.İ.Y.

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REFERENCES

1. *Sertaç AG, Tamer A . Medical photograhpy: historical development and basic concepts. Turk J Dermatol. 2017;11:98-108.*
2. *Kılıç L. Fotoğraf ve sinemanın toplumsal tarihi. 1. Baskı. Ankara: Dost Kitabevi Yayınları; 2008.*
3. *Pasquali P. Photography in clinical medicine. Cham: Springer International Publishing; 2020:47-72.*
4. *Tomlinson-Leah K, Sweatman J. Investigating the supply and use of medical photographs in medical education. J Vis Commun Med. 2019;42:169-181.*
5. *Nguyen TT, VanderWalde L, Bellavance E, Eisenhauer T, Hieken T, Johnson N, et al. Ethical considerations of medical photography in the management of breast disease. Ann Surg Oncol. 2018;25:2801-2806.*
6. *Arimany Manso J, Taberner Ferrer R, Pidevall I, Mascaró Ballester JM, Martin-Fumadó C. Use of photography in dermatology: ethical and legal implications. Actas Dermosifiliogr (Engl Ed). 2020;111:107-114. English, Spanish.*
7. *Bennett KG, Bonawitz SC, Vercler CJ. Guidelines for the ethical publication of facial photographs and review of the literature. Cleft Palate Craniofac J. 2019;56:7-14.*
8. *Teven CM, Goldman JJ, Rebecca AM. Ethical considerations in clinical photography: an updated perspective. Plast Reconstr Surg. 2021;147:366e-368e.*
9. *Alvarado SM, Flessland P, Grant-Kels JM, McFarlane M, Feng H. Practical strategies for improving clinical photography of dark skin. J Am Acad Dermatol. 2022;86:e21-e23.*
10. *Sadler D. Better clinical and post mortem photography: a crash course in ten technical tips. J Forensic Leg Med. 2019;67:49-60.*
11. *Golinko MS, Abou-Ghanem O, Simard M, Caudill M, Pontell ME, O'Sick N, et al. ImageAssist: a novel smartphone application for standardized clinical photography that implements and automates American Society of plastic surgery/plastic surgery foundation photographic guidelines with background deletion. Ann Plast Surg. 2024;92:367-372.*
12. *Zargaran A, Ash J, Kerry G, Rasasingam D, Gokani S, Mittal A, et al. Ethics of smartphone usage for medical image sharing. Indian J Surg. 2018;80:300-301.*
13. *Brinkworth S, Kenny A, Knights C. Managing out of hours clinical photography at the University Hospitals Bristol. J Vis Commun Med. 2018;41:85-89.*