

# Perception and acceptance of medical photography among Arab dermatology patients: a cross-sectional analysis

Saba AlSuhaymi,<sup>1</sup> Faisal Alghubaywi,<sup>2</sup> Raghad AlHarthi,<sup>2</sup> Afaf Al AlSheikh,<sup>1,2</sup> Mohammed I. AlJasser<sup>1-3</sup>

<sup>1</sup>College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh; <sup>2</sup>Division of Dermatology, King Abdulaziz Medical City, Ministry of National Guard Health Affairs, Riyadh; <sup>3</sup>King Abdullah International Medical Research Center, Riyadh, Saudi Arabia

Correspondence: Faisal Alghubaywi, Division of Dermatology, King Abdulaziz Medical City, Riyadh, Saudi Arabia, P.O. Box 3660, Riyadh 11481, Saudi Arabia.  
E-mail: Faisalalghubaywi@gmail.com

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Informed consent: the authors obtained written consent from patients for their photographs and medical information to be published in print and online and with the understanding that this information may be publicly available. Patient consent forms were not provided to the journal but are retained by the authors.

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## Abstract

Medical photography has been utilized in clinical, academic, and research settings. In conservative countries, such as Saudi Arabia, limited data reflect patients' viewpoints on medical photography. The aim of this paper was to assess patients' opinions on medical photography and the factors influencing its acceptability. A cross-sectional study utilizing a self-distributed paper-based questionnaire was performed in the dermatology clinics at King Abdulaziz Medical City (Riyadh, Saudi Arabia) between February 2020 and January 2021. The response rate is 100% as only willing participants were handed a hard-copy survey and then retrieved once completed. A total of 414 Saudi adults were enrolled. Medical photography was highly acceptable, fairly acceptable, and poorly acceptable in 36.7%, 11.6%, and 14.3% of the patients, respectively. Females were more accepting of medical photography than males ( $p=0.041$ ). Physicians were the most preferred choice as photographers (83%). Stating all intended use of the photographs was favored by most patients. Using a department-owned camera was essential to 84%. Patients who never had their photographs taken previously were more unaccepting of medical photography than those with prior experience ( $p=0.037$ ). The main limitation of the study was that it was conducted at a single center; therefore, it may not represent the entire population. Medical photography is acceptable to the majority of patients. Meeting popular preferences, including physicians as photographers, using department-owned cameras, and stating all possible uses of the photographs may enhance patients' experience. The findings offer insight for developing a standardized framework that is suitable for both patients and physicians.

## Introduction

Medical photography has been practiced in a wide spectrum of medical and surgical specialties.<sup>1</sup> However, the visual nature of dermatology has made photography an increasingly important component of daily practice.<sup>1-3</sup> As technology has rendered digital cameras and smartphones convenient, it has contributed to spreading photography more widely in clinics.<sup>1-6</sup> Moreover, integrating the digital form of medical record systems has enhanced digital photography by facilitating rapid storage and sharing of patient data.<sup>4,7</sup> Medical photography has been utilized in clinical, academic, and research settings. Physicians are increasingly incorporating medical photography as a tool for patient data documentation, monitoring management or disease progression, or consultations with other physicians.<sup>1,2,4-8</sup> Medical photography has also been exploited for educational purposes, as it is used in lectures, books, and websites.<sup>1,2,4-8</sup> As for research, photography plays an essential

role in documentation, case reporting, and analysis by providing reproducible visualization rather than relying on descriptive language.<sup>2,4,6-9</sup> As photography inherently places patient privacy at risk, medical photography's ethical and legal aspects are of critical importance.<sup>3,5,10,11</sup> A major concern related to photography is unapproved dissemination, especially during dynamic and immediate cyber interconnectivity, highlighting the role of well-informed consent and secure data storage. The psychological impact of photographing vulnerability imposed on the person is another aspect that affects the patient's experience and outlook on their healthcare.<sup>10,11</sup> Thus, the focus has been on establishing a standardized framework safe for both patients and physicians by obtaining and documenting informed consent and ensuring the safety of storage devices.<sup>1,2,6,12</sup>

In Europe, organizations like the Institute of Medical Illustrators have developed and implemented guidelines for clinical practices that involve medical photography.<sup>7,13</sup>

Until recently, most guidelines have not weighed patient opinion when developing standards.<sup>7</sup> In other words, while modern medical practice is based on shared decision-making, the patient's end of the equation is not factored in when it comes to medical photography. A relatively recent shift of focus is looking into the patient outlook for updating standards of clinical photography.<sup>3,4,7,8,14</sup> In Saudi Arabia, there are limited data reflective of patient viewpoints on medical photography in clinical practice. Hence, our study aims to assess patients' opinions on medical photography which in turn might help structure more relevant guidelines for medical photography practice.

## Materials and Methods

This is a cross-sectional study conducted in the waiting areas of the dermatology clinics at King Abdulaziz Medical City in Riyadh, Saudi Arabia, between February 2nd, 2020, and January 31st, 2021. The study was performed according to the declaration of Helsinki principles and was approved by the institutional ethics committee at King Abdullah International Medical Research Center (IRBC/2200/19).

All adults (*i.e.*, age 18 or older) attending the dermatology clinics who were happy to partake were involved in the study after obtaining informed consent. A pre-validated English questionnaire was adapted, modified, translated, and revalidated.<sup>4</sup> The translation was achieved according to the World Health Organization (WHO) standard steps.<sup>15</sup> The forward translation was performed by two independent medical students, producing two separate Arabic versions of the questionnaire, which then was reviewed and edited by one of the investigators of this study to produce a finalized Arabic version. The back-translation was completed by two other independent medical students, producing two separate English versions, which were reviewed by the same investigator and combined to produce a final English version. The original and back-translated English versions were compared, and no significant discrepancy was noted. The pretesting and cognitive interviewing were established using a pilot questionnaire on 46 participants and yielded a Cronbach's alpha score of 0.731. The survey was then revised for content validity, readability, and clarity by two dermatologists leading to its finalization. The questionnaire is composed of twenty-one questions that focus on three domains: patients' demographic characteristics (3 questions), previous experience with medical photography (3 questions), and acceptability and photography preferences (15 questions). Overall, twenty questions were close-ended, and one was open-ended. The questionnaire required approximately 10 minutes to complete.

The estimated sample size was 377. It was calculated assuming that 50% of the subjects positively perceived medical photography, with a 95% confidence level and a 5% margin of error. Convenience sampling was employed, and an additional 10% was added to the original sample size to compensate for potentially excluded questionnaires. The response rate is 100% as only willing participants were handed a hard-copy survey and then retrieved once completed.

Statistical analyses were performed with SPSS 25.0 software (SPSS, IL, USA). The descriptive statistics were presented as frequencies and percentages for the categorical variables and as means and standard deviations for the numerical variables. The chi-square test was utilized for the proportional correlations. A *p*-value of <0.05 was considered statistically significant for all statistical tests.

## Results

A total of 414 patients, who had fully answered the questionnaire, or only had 1-2 missing answers were enrolled. Females comprised 289 (69.8%) of the participants (Table 1). The mean age was 32.9 ( $\pm 12$  years). The most prevalent level of education among the subjects was a bachelor's degree (175 [42.3%]), followed by a high school degree or a diploma [139 (33.6%)].

The study included 105 (25.4%) patients who had been photographed at the dermatology clinics before (Table 2). Among them, digital cameras were used the most (13.3%). Verbal consent was obtained more frequently than written consent, 19.6%, and 3.1%, respectively. Consent was not obtained in 3.1%.

Physicians, as photographers, scored the highest acceptance rate among all photographer preferences (83%), while professors or teachers followed with 80% (Figure 1). Fifty-nine percent of participants were indifferent to the photographer's gender (Table 3). The most preferred camera type was department-owned cameras (58.4%); also, the most preferred storage method was department files (36.2%). When asked about their acceptability to the possible uses of the photographs, the most acceptable use was sharing the photographs with other physicians involved in their management (20.2%); followed by 14.1% of participants who found presenting the photographs at medical conferences acceptable. The lowest acceptability rates were noted with the display of photographs on medical web articles and medical television programs, 6% and 5.5%, respectively. Participants were asked about their opinion on several statements regarding medical photogra-

**Table 1.** Patients' demographics.

Characteristic	N. (tot 414)	%
Gender		
Female	289	69.8
Male	122	29.5
No answer	3	0.7
Age		
20 years and less	61	14.7
From 21 to 40	252	60.9
From 41 to 60	94	22.7
More than 60 years	7	1.7
Education level		
Less than high school	72	17.4
High school degree/diploma	139	33.6
Bachelor's degree	175	42.3
Higher degrees	25	6.0
No answer	3	0.7

phy (Table 3, Question No. 7). The most agreed-upon statement was: “[medical photography] can improve the diagnosis” (25.7%). The following are the preference patterns regarding consent for medical photography: Verbal consent was upheld as means of consent taking by 52.2%, compared to written consent (47.8%). Ninety percent of participants agreed that the consent document should mention all potential utilizations of the photographs. Similarly, the need to educate patients on all possible utilizations of the photographs was the most voted suggestion (40.2%) to improve the experience of medical photography.

The level of acceptance was computed by categorizing the number of participants’ choices of acceptable photographers. Zero choices were considered unacceptable, one poorly acceptable, and up to five highly acceptable (Table 4). The highest acceptance level was observed among females, ages 21-40 years, and holders of bachelor’s degrees. The association between the acceptability level and demographic factors was only statistically significant in relation to patients’ gender ( $p=0.041$ ). Patients who never had pictures taken previously were more unaccepting of medical photography, as the association between the acceptability level and previous experience (Figure 2) was statistically significant ( $p=0.037$ ).

## Discussion

With the evolution of digital medical photography, an equilibrium between technological advancements and ethical acceptability is imperative. Currently, it is common for patients attending the dermatology clinic to have their photographs taken as part of their care in a highly visual field. The best method of optimizing patients’ care through photography without enduring discomfort or harm is to establish standardized regulations in photography-rich specialties. Empirical data on patients’ perceptions and preferences can guide those regulations to a safe haven for both patients and physicians. So far, few studies have assessed patients’ opinions on medical photography worldwide. Studies are especially lacking among Arab patients whose culture may be considered on the more conservative side. Moreover, Lager *et al.* concluded in their study that different races and ethnicities perceive medical photography disparately, with Latinos and African Americans having less favorable views, emphasizing the importance of a local point of view.<sup>7</sup>

In our study, most patients had a favorable view of medical photography, agreeing to be photographed by multiple photographers of different backgrounds within the medical field. This is consistent with previous studies that show an overall accepting

attitude toward medical photography.<sup>4,7,8,14</sup> Interestingly, females were more accepting of medical photography than males ( $p=0.041$ ). This may be explained by the heightened aesthetic perception among females assuming photography will lead to a timely diagnosis and resolution of her bothersome visible symptoms.<sup>16</sup> Nonetheless, most participants (94%), males and females, believe that photography enhances their diagnosis and management. This percentage is higher than reported with American patients by

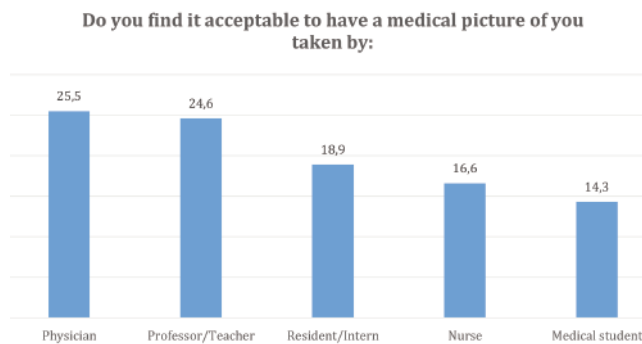


Figure 1. The photographer title preferences.

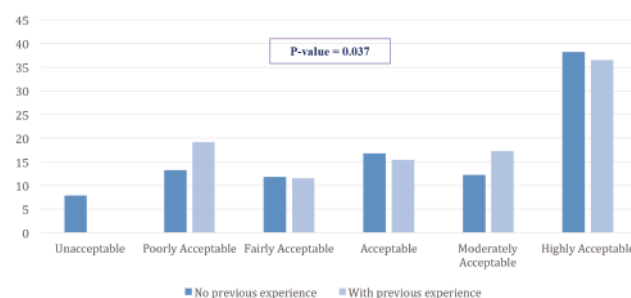


Figure 2. The relation between the patients’ acceptability and previous experience.

Table 2. Previous experience of Saudi patients with medical photography in dermatology clinics.

Characteristic	N. (tot 414)	%
Have you ever had a medical picture taken in a dermatology clinic before?		
No	307	74.2
Yes	105	25.4
No answer	2	0.5
If yes, what type of camera was used?		
No answer because never been photographed	307	74.2
Digital camera	55	13.3
Camera phone	47	11.4
No answer	5	1.2
Were you asked for your consent before the picture was taken?		
No answer because never been photographed	307	74.2
Yes, verbal consent	81	19.6
Yes, written consent	13	3.1
None	13	3.1

**Table 3.** The perception of Saudi patients towards medical photography in dermatology clinics.

Characteristic	N. (tot 414)	%
1. Would you rather have your picture taken by:		
Female	145	35.0
Male	21	5.1
No difference	246	59.4
No answer	2	0.5
2. Do you believe that it is necessary for the person taking the picture to be wearing an identification badge that states that he/she is authorized to take medical pictures?		
No	59	14.3
Yes	353	85.3
No answer	2	0.5
3. Do you find it acceptable to have your picture taken by:		
The Department's camera	348	58.4
The Physician's camera	159	26.7
The Physician's phone camera	89	14.9
4. Which way do you find acceptable to save the pictures:		
In the department's archive/files	318	36.2
In the physician's personal computer	247	28.1
In a computer that is accessed via a password	246	28.0
In a computer that is accessed without a password	68	7.7
5. At the end of your doctor's office visit, would you prefer to:		
See the pictures after your consultation/stay in the hospital	308	57.5
Get a copy of the picture	228	42.5
6. Do you find the use of your pictures (in which you cannot be identified) is acceptable in:		
Sharing the pictures with other physicians involved in your management	373	20.2
Display the pictures in medical conference	259	14.1
Use the pictures for the education of medical students	249	13.5
Use the pictures to assess in the consultation of other patients	244	13.2
Publish the pictures in medical journals	123	6.7
Distribute the pictures to medical television programs	102	5.5
Distribute the pictures to medical websites on the internet	110	6.0
Sharing the pictures with specialized physicians through e-mail	251	13.6
7. In regard to pictures taken for medical purposes, do you agree with the following?		
Medical photography is a procedure	373	24.6
Contribute to improving diagnosis and follow up of dermatology cases	389	25.7
Contribute to the education of dermatology cases	376	24.8
Possible to be misused	117	7.7
Feels like a violation of your privacy	105	6.9
Makes feel uncomfortable	156	10.3
8. In regard to pictures taken for medical purposes, do you agree with the following?		
It is medical procedure, like an X-ray or a CT scan	312	54.8
It is possible that it involves a paying a fee	46	8.1
It is possible to cover the expense through health insurance	211	37.1
9. In regard to pictures taken for medical purposes, you feel:		
Must have verbal consent	298	52.2
Must have written consent	273	47.8
10. Do you think that all the utilizations (mentioned in question 6) should be stated in the consent form for medical photography?		
No	32	7.7
Yes	373	90.1
No answer	9	2.2
11. In regard to the utilizations of the pictures (mentioned in question 6), do you prefer:		
Specifically, where you decide which kind of utilizations you agree on	262	63.3
Generally, for all possible utilizations	145	35.0
No answer	7	1.7
12. In regard to repetitive utilizations, would you prefer:		
Consent is obtained only once, remains valid for each new use	214	51.7
Consent is asked for each purpose the pictures are used for	195	47.1
No answer	5	1.2
13. How can medical photography be improved in dermatology?		
Requires improvement	296	33.1
Requires more information and awareness about its utilization	359	40.2
Requires a more detailed written consent form	239	26.7



**Table 4.** The relation between patients' demographics and acceptability level.

Demographics	Acceptability level						p
	Unacceptable, n (%)	Poorly acceptable, n (%)	Fairly acceptable, n (%)	Acceptable, n (%)	Moderately acceptable, n (%)	Highly acceptable, n (%)	
Gender							
Female	15 (62.5)	39 (66.1)	38 (79.2)	55 (82.1)	41 (74.5)	96 (63.2)	0.041*
Male	9 (37.5)	20 (33.9)	10 (20.8)	12 (17.9)	14 (25.5)	56 (36.8)	
Age							
20 years and less	1 (4.2)	8 (13.3)	5 (10.4)	13 (19.4)	9 (16.4)	25 (16.2)	0.535
From 21 to 40	18 (75.0)	37 (61.7)	27 (56.3)	42 (62.7)	35 (63.6)	88 (57.1)	
From 41 to 60	5 (20.8)	14 (23.3)	16 (33.3)	10 (14.9)	10 (18.2)	38 (24.7)	
More than 60 years	0 (0.0)	1 (1.7)	0 (0.0)	2 (3.0)	1 (1.8)	3 (1.9)	
Education level							
Less than high school	3 (12.5)	11 (18.3)	9 (18.8)	18 (27.3)	6 (10.9)	25 (16.4)	0.503
High school degree/diploma	9 (37.5)	20 (33.3)	11 (22.9)	20 (30.3)	23 (41.8)	52 (34.2)	
Bachelor's degree	11 (45.8)	25 (41.7)	24 (50.0)	27 (40.9)	24 (43.6)	63 (41.4)	
Higher degrees	1 (4.2)	4 (6.7)	4 (8.3)	1 (1.5)	2 (3.6)	12 (7.9)	

Lager *et al.* (88.7%) and with Chinese patients by Wang *et al.* (79%).<sup>7,8</sup> As photography renders the patient vulnerable, choosing the most responsible physician (MRP) may bring comfort to the patients; perhaps that is why physicians were our participants' most accepted choice of photographers (83%). This is comparable to a study by Hacard *et al.* among French adult and pediatric patients that found a preference towards physician photographers by 91%.<sup>4</sup> In addition, their study concluded that the gender of the photographer did not matter to 59.9% of French patients, which is strikingly consistent with the findings among Saudi patients (59.4%).

In alignment with the previous studies, the majority of our patients preferred the department-owned camera and archives as tools to capture and store photographs.<sup>4,7,8,14</sup> The belief of proper storage limited to in-clinic use assures the patients that their privacy will not be violated or used unethically. Unfortunately, a clinic-owned camera or digital storage system may not always be feasible in clinical practice as resources vary substantially between hospitals and healthcare centers. The physician-owned professional cameras were more tolerable to our population (38.4%) than reported by Hacard *et al.* (26.8%), but mobile phone cameras were widely unacceptable in both studies (78.5% and 75.7%).<sup>4</sup>

Although unidentifiable, publishing the pictures in medical journals was only acceptable to 30% of our patients. This is significantly lower than the percentages reported among British patients by Lau *et al.* (87%) and Chinese patients by Wang *et al.* (92.8%). On the other hand, sharing photographs at conferences was acceptable more than two-fold (63%) when compared to publishing in medical journals. The discrepancy of acceptability between journal publication and conference display may be influenced by the notion that open-access journals permit easy viewing of their photographs by the general public, while conferences are mainly sought by healthcare personnel. Previous studies discovered medical photography could bring psychological agony to patients in their most vulnerable state.<sup>6,16,17</sup> We found that one-fourth of our participants concur with the statement "medical photography feels like a privacy violation"; fueling the purpose of this study to identify factors associated with improving the process of medical photography for all patients.<sup>18</sup>

Resembling any diagnostic or therapeutic procedure, medical photography should only be carried out after informed consent. Legal counsel is advised when drafting the consent form as medico-legal concerns differ according to specific institutional policies. However, in our survey, verbal informed consent was

slightly favored over the written form. Nevertheless, though it may be less convenient, written consent is the optimal way of practice as it can be retrieved in the future to protect both patient and physician. Regarding improving medical photography, an overwhelming agreement voiced by our participants (87%) was the need for further elaboration and education on the utilization of the photographs, emphasizing the importance of a well-designed consent pathway. Notably, those without previous experience with medical photography (75%) were more unaccepting than those with prior exposure ( $p=0.037$ ). Perhaps participants with a previous encounter with medical photography may have seen for themselves the benefits of keeping photographic documents of their condition; however, this aspect was not explored in our analysis. Overall, this study was limited by the definition that was used for photography acceptability which might have low accuracy. In addition, the study was conducted at a single center; therefore, it may not represent the entire population.

## Conclusions

In conclusion, the perception of medical photography was positive among most of our participants, who preferred to be photographed by physicians via department-owned cameras. Patients' preferences for the type and storage of the department's photographic equipment are synonymous with the assurance of proper privacy safekeeping; however, concerns about data protection and patient confidentiality should be addressed. It has been revealed that a well-written consent form detailing all possible utilizations of the photographs is of the utmost importance. As healthcare centers, academic institutions, and medical journals seek to establish best practices for medical photography, we encourage using this empirical data to design those policies into a safe framework for both patients and physicians, enhancing the healthcare experience.

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