Published in final edited form as:

Dermatol Surg. 2019 April ; 45(4): 588–597. doi:10.1097/DSS.0000000000001829.

The Non-Physician Practice of Cosmetic Dermatology: A Patient and Physician Perspective of Outcomes and Adverse Events

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Abstract

Background—Non-physicians are expanding practice into specialty medicine. There are limited studies on patient and physician perspectives as well as safety outcomes regarding the non-physician practice of cosmetic procedures.

Objective—Identify the patient (consumer) and physician perspective on preferences, adverse events and outcomes following cosmetic dermatology procedures performed by physicians and non-physicians.

Materials and Methods—Internet-based surveys were administered to consumers of cosmetic procedures and physician members of the American Society for Dermatologic Surgery (ASDS). Descriptive statistics and graphical methods were used to assess responses. Comparisons between groups were based on contingency chi-square analyses and Fisher's exact tests.

Results—2,116 commenced the patient survey with 401 having had a cosmetic procedure performed. Fifty adverse events were reported. A higher number of burns and discoloration occurred in the non-physician treated group and took place more often in a spa setting. Individuals seeing non-physicians cited motivating factors such as: level of licensure (type) of non-physician, a referral from a friend, price, and the location of the practitioner. Improper technique by the non-physician was cited most as a reason for the adverse event. Both groups agree that more regulation should be placed on who can perform cosmetic procedures.

Limitations—Recall bias associated with survey data.

Conclusion—Patients treated by non-physicians experienced more burns and discoloration compared to physicians, and they are encountering these non-physicians outside a traditional

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medical office, which are important from a patient safety and regulatory standpoint. Motivating factors for patients seeking cosmetic procedures may also factor into the choice of provider.

Keywords

cosmetic dermatology, non-physician; adverse events, survey; burns; discoloration

Introduction

There is an ongoing increase in the demand for medical, surgical, and cosmetic procedures[1]. According to the 2016 American Society for Dermatologic Surgery (ASDS) Survey on Dermatologic Procedures, members saw a significant increase in minimally invasive cosmetic treatments over the prior year. In 2016 there were over 3.3 million injectable neuromodulators and soft-tissue filler procedures performed, and nearly 2.8 million laser/light/energy-based procedures. In the last 5 years, there has been a 48% increase seen in soft-tissue fillers procedures and 2.5 times increase in body contouring procedures performed[2]. Furthermore, the 2017 ASDS Consumer Survey on Cosmetic Dermatologic Procedures found that of the 7,322 people surveyed nearly 7 in 10 are considering a cosmetic procedure. The top 4 of 11 factors influencing the selection of a practitioner included: price (49%), specialty in which the physician is board-certified (41%), referral from a physician (37%), and level of licensure of the practitioner (32%) [3]. This increased demand for cosmetic services has resulted in a substantial influx of non-physicians offering cosmetic procedures and patients turning to non-physicians for aesthetic medical treatments[4]. Non-physicians are also starting to practice medicine independently in some states. Though originally intended for the shortage of primary care physicians, non-physician providers (aestheticians, nurses, physician assistants, and nurse practitioners) are entering into specialty medical fields, even though formal medical training in these areas may be lacking. This is concerning from a patient safety standpoint.

Increasingly, non-physicians are offering cosmetic procedures in a multitude of medical and non-medical arenas. The boundaries between cosmetic surgery and cosmetology are obscured, with procedures being performed on otherwise healthy individuals by non-physicians [5]. While often promoted as a “quick fix”, real risks and complications associated with these procedures may be marginalized.

Studies have also shown that dermatologists and non-dermatologist physicians delegate cosmetic procedures to non-physician providers to keep up with growth in demand [4]. This study seeks to determine the outcomes of cosmetic procedures performed by physicians and non-physicians as well as the patient and physician perspectives of such. We describe the incidence and scope of adverse events as reported by both consumers and physicians. A better understanding of these outcomes will help guide physician oversight of these procedures and the training and regulations required of those who perform these procedures to ensure patient safety.

Methods

With IRB approval, internet-based surveys (Survey Monkey: <http://www.SurveyMonkey.com>) were administered to consumers of cosmetic dermatology procedures and physician members of the ASDS. The consumer survey was web-based and opened by 2,116 consumers nationally via Survey Monkey, which allows surveys to be distributed to a random prescreened population. The English language survey was distributed via email. The survey contained 24 multiple-choice questions related to provider type, setting where services were provided, and adverse events. Based on the question, participants were allowed to choose single or multiple responses and responders were able to skip questions or stop the survey at any time (See Supplemental Digital Content 1, Appendix, <http://links.lww.com/DSS/A131>).

A separate physician survey was sent to members of the ASDS via email. This survey assessed members' opinions and experiences with cosmetic procedures performed by non-physicians (See Supplemental Digital Content 1, Appendix, <http://links.lww.com/DSS/A131>).

After acquiring completed surveys, each was assessed individually by the investigators. Participants were allowed to stop the survey at any point and were allowed to skip questions. Statistical analysis and comparisons between groups were based on contingency chi-square analyses and Fisher's exact tests.

Results

Consumer survey (N = 2,116)

Demographics (Table 1)—Of the 2,116 surveys commenced by consumers, over half (55.9%) indicated that they either had a cosmetic procedure (19.1%, 401 / 2,098) or were considering having a cosmetic procedure (36.8%, 773 / 2,098). Of the patients who received cosmetic procedures, 145 went to a physician, 144 saw non-physicians, and 97 have had procedures done by both physicians and non-physicians. The remaining responders did not know the level of training of the individual who performed the procedure.

Scope of Procedures and Providers—The most common procedures consumers received were laser hair removal, injectable wrinkle-relaxing treatments, microdermabrasion, chemical peels, and injectable filler treatments (Table 2). Table 2 includes the breakdown of procedures reported to be done by non-physicians as well as the percent of adverse events per procedure. Of the respondents who had a cosmetic procedure done by only a non physician, the top procedures performed included: laser hair removal, 49% (71); microdermabrasion, 35.9% (52); chemical peels, 23.4% (34); laser and light devices for facial problems, 13.8% (20), and injectable wrinkle relaxing treatments, 13.1% (19). The majority of procedures performed by physicians were done by either a plastic surgeon (33.1%) or a dermatologist (32.3%). Other types of physicians included family practitioners, otolaryngologists, and vascular specialists (responders were able to choose more than one if applicable). Of the procedures performed by non-physicians, the majority

was performed by an aesthetician (43.5%) followed by a nurse (21.9%) (Table 3). Other non-physician providers included: nurse practitioners, and laser technician.

Location of Cosmetic Procedures—The vast majority of consumer respondents who had their procedure performed by a physician identified the location as the physician's office (87.6%) ($p < 0.0001$). This was followed by a spa location (4.1%), or an aesthetician's office. In contrast, for patients who had their procedures performed by non-physicians, this most often took place in a spa (36.8%, $p < 0.001$), followed by an aesthetician's office (25.7%, $p < 0.001$), and physician's office (22.2%). (Table 4) (Figure 1).

Adverse Events (Table 5, Figure 2 and 3)—Fifty out of the 404 respondents who had cosmetic procedures reported an adverse event. A total of 54% ($n = 27$) occurred in patients who saw physicians and 46% ($n = 23$) in patients who saw non-physicians. The most common adverse events occurring in procedures performed by physicians were: "bruising" (40.7%, $n = 11$), "discoloration" (14.8%, $n = 4$), "scarring" (14.8%, $n = 4$), and "nerve damage" (14.8%, $n = 4$). In procedures performed by non-physicians, the most common adverse events were "discoloration" (43.4%, $n = 10$), "burn" (34.7%, $n = 8$), and "bruising" (26.1%, $n = 6$) (See Table 5). The difference in rates of discoloration and burns was significantly higher in procedures performed by non-physicians compared to physicians ($p < 0.03$) (Figure 2). The occurrence of nerve damage after procedures performed was cited in 4 cases by the responders. All 4 physicians performing these were cited as non-dermatologist physicians and the procedures performed included neurotoxin (1), body sculpting (2), and varicose vein treatment (1). When adverse events are further sorted between dermatologists, plastic surgeons, other physicians, and non-physicians, the rates of discolorations and burns are still higher for non-physicians (Figure 3).

Consumer Viewpoint of Provider Qualifications—Consumers were asked which non-physician providers were qualified to perform cosmetic procedures. A majority of respondents felt physician assistants (68.0%) and nurses (57.3%) were qualified to perform cosmetic medical procedures. Conversely, a majority felt that medical assistants (70.7%), aestheticians (57.9%), and spa staff other than aestheticians (90.8%) were not qualified (multiple responses were accepted).

If consumers selected "no," indicating that a particular group was not qualified to perform cosmetic medical procedures, 34.1% said it was because the individual was not a physician. Greater percentages of respondents said it was due to a lack of training (47.5%) or an inadequate level of training (75.4%). Responses under "other" included a "lack of accountability", "lack of experience handling difficult cases", and "no certifying or supervisory agency".

Consumer Motivation to Choose Provider (Figure 4)—Consumers were asked what factors were important when choosing a provider for their cosmetic procedure. Of individuals who responded to this question and saw a physician ($n = 140$), the most important factors were board certification of physician (66.4%, $n = 93$, $p < 0.0001$), referral from a physician (59.3%, $n = 83$), number of procedures performed (37.1%, $n = 52$), and level of licensure of physician (36.4%, $n = 51$). For those who responded to this question and

saw non-physicians ($n = 137$), the most important factors were level of licensure (59.1%, $n = 81$, $p < 0.0001$), referral from a physician (48.2%, $n = 66$) and referral from a friend (41.6%, $n = 57$, $p < 0.05$). Price ($p = 0.053$), and the location of the practitioner ($p < 0.005$) were also important for those seeing non-physicians. Consumers who responded with the “other” option cited patient reviews, websites, and the complexity of the procedure as motivating factors for choosing a practitioner.

Physician survey (N = 118 responses)

Dermatologic Surgeon Treatment of Cosmetic Complications—This survey assessed the types of complications that physicians have encountered with cosmetic procedures performed by non-physicians. Of the 118 ASDS members who responded to the survey, 65 (55%) stated that they treated a complication from a cosmetic procedure performed by a non-physician. Most respondents (43.1%) reported treating 1–3 complications, while 24.6% treated 4–6 complications, and 7.7% treated complications 7–9 times. Nearly a quarter of respondents (24.6%) reported treating 10 or more cases of complications resulting from cosmetic procedures performed by non-physicians (Figure 5).

ASDS members were then asked to select which types of complications they observed following cosmetic procedures performed by non-physicians. The most common adverse event was a burn (67.2%) followed by misplacement of filler product (53.1%). Other common complications included facial drooping (34.4%), tissue deformity (29.7%), and bruising (28.1%). “Other” responses included hypo- or hyperpigmentation, leg ulcers, and scarring (Figure 5).

Physicians were then asked to evaluate the most likely contributing factors for the adverse events that were encountered. The most common response was improper technique (43.8%) followed by improper settings (12.5%). Less than 10% of complications were considered an expected adverse event (Figure 6).

Regulation of Cosmetic Procedures—Both physician and consumers were polled as to whether there should be stricter regulations on who can perform cosmetic procedures. The majority of ASDS members (86.3%) said there should be stricter regulation. Of the consumers surveyed, a majority (85.8%) also said there should be stricter regulations. There was no difference between the physician group and consumers group ($p = 0.88$).

Discussion

The demand for cosmetic medical procedures continues to rise and patients are seeking treatment in a variety of settings by both physicians and non-physicians. This undersupply of board certified dermatologists has had a significant impact on patient access to care and has resulted in long wait times with patients seeking alternative providers for their care [1, 6]. The performance of cosmetic procedures warrants close inspection and a survey of the current landscape of procedures being performed; as it is important to understand who is performing these procedures, the adverse event profiles, and outcomes. A major finding of this study was that the majority of cosmetic procedures being performed by non-physicians took place outside of a traditional medical office setting. Procedures occurring in other

settings may raise concerns regarding oversight, standards, and regulations that are in place to protect patients and ensure safety. Additionally, burns and discolorations were cited as the most common adverse events encountered by patients treated by non-physicians.

Adverse events

Overall, numbers of adverse events were quite low in this study, with only 50 adverse events reported by consumers, the nature of which is in line with reports regarding the safety of dermatologic cosmetic procedures[7]. While our study looks at both physicians and non-physicians, this number may underestimate the actual prevalence, as reporting of adverse events is not mandatory, especially for procedures that take place outside of a physician's office. Of the specific adverse events, there was a statistically significant greater difference in the rates of discoloration and burns in the non-physician group compared to the physician group. This echoes previous published reports by Jalian et al. of a higher rate of litigation for laser burns when performed by non-physicians [8]. The burns and discoloration experienced by patients after procedures performed by non-physicians may result from inadequate training in how the skin responds to cosmetic procedures (such as lasers) or from insufficient training in selecting the ideal patient and appropriate laser parameters. The majority of adverse events reported by consumers who saw physicians was bruising, and bruising can be an expected part of certain procedures. Of note, was the prevalence of nerve damage reported by consumers, which approached significance in the physician treated group. None of the nerve damage was cited as permanent, and the procedures performed included neurotoxin (1), body sculpting (2), and varicose vein treatment (1). It was not gauged as to what type of, sensory or motor, impairment occurred in these 4 cases.

Consumer viewpoint of qualified providers

Consumer motivation is a major factor in aesthetic medicine. A further understanding of the motivating factors that drive patients to certain practitioners is important for comprehending the role of non-physicians. Regarding provider qualification, consumers favored nurses and physician assistants to perform cosmetic medical procedures over other non-physicians. However, this is interesting because a majority of patients in this survey treated by non-physicians were treated by an aesthetician. This suggests that there are competing factors, such as location, affordability, and persuasive marketing strategies in place that effectively entice patients into having cosmetic procedures in non-medical settings by those that they perceive as less qualified. This could also echo previous American Medical Association surveys showing that patients may not understand the different levels of licensure or types of non-physician providers [9].

ASDS members' responses

Almost a quarter of ASDS members reported treating 10 or more complications from procedures performed by non-physicians. This number is higher than consumer-reported complications, and could underscore the notion that most complications go unreported by patients or providers. From the complications that ASDS members reported treating, a laser burn was the most common adverse event, which reinforces recent literature and our own results from this study. Interestingly, misplacement of filler product was the second most common event, and "improper technique" was cited as the most common reason. Anatomy

knowledge, injection technique, and selecting appropriate patient cases to perform are all factors that could contribute to this. Other physician surveys have shown that, while the majority of physicians feel nurses are capable of administering vaccines, they are not as capable as physicians at administering injectable cosmetic procedures [10]. This could be because of the nature of the procedures, a physician's in depth knowledge and hands on training in anatomy, and the complexity involved. In this study, over 85% of dermatologic surgeons and consumers alike said there should be stricter regulation over who can perform cosmetic procedures. Clarification on training requirements and scope of practice guidelines might help ensure standards are upheld and patient safety is preserved.

Limitations

This study has limitations due to the nature of survey based research and inherent response bias. This was an email-based survey which also may not fully capture the complete demographic of consumers and patients were not asked how times they had a procedure done. Also, as previous American Medical Association surveys have shown, patients may not know the exact degree or title of the treating practitioner which may have influenced their ability to accurately respond to questions. Physician members of the ASDS were not asked specifically about adverse events that resulted from cosmetic procedures performed by other physicians. Other studies have shown that cosmetic procedures are performed by various specialties outside of dermatology, including: general surgery, otolaryngology ophthalmology, facial plastic surgery, family medicine, pediatrics, and internal medicine [12]. Future studies are warranted to better characterize adverse events following physician-performed cosmetic procedures, as this may call into question scope of practice of various providers.

Conclusion

Adverse events reported by consumers following cosmetic procedures are infrequent, but still occur. The most common types of adverse events reported with cosmetic procedures performed by non-physicians are burns and discoloration. This contrasts the reported those from procedures performed by physicians in this study, which consisted mainly of bruising, which does not imply an adverse event per se. A majority of patients seeing non-physicians are encountering them outside the traditional medical office, including spas. This could reflect the growing number of "medispas," that are being operated by non-physicians and could represent a potential concern for safety and regulation. Attention should be given to this alarming trend, as these untraditional settings may not be held to medical practice standards and have inadequate oversight from qualified physicians. Moving forward, we need improved data collection on adverse events, and outcomes, which may help guide regulations and oversight necessary for providing quality care and ensuring patient safety.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgement:

We are grateful to the American Society for Dermatologic Surgery Future Leaders' Network and staff for contributing to this project, including Tamika Walton, Jolene Kremer, Debra Kennedy, and Katherine Duerdoth.

Thank you to Stephen Dusza, DrPH for his work on the statistical analysis of this project.

This research was funded through the American Society for Dermatologic Surgery – Future Leaders' Network as well as in part through the **NIH/NCI Cancer Center Support Grant P30 CA008748**.

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Key Points

Both patients and physicians think more regulation should be in place on who can perform cosmetic procedures. More adverse events such as burns and discolorations occurred with patients seeing non-physicians compared to those seeing physicians. Additionally, for those seeing non-physicians, a majority of these encounters took place in spa settings.

Patient safety is of utmost concern when it comes to elective cosmetic medical procedures. More adverse events and encounters occurring outside traditional medical settings when non-physicians performed these procedures call into question the required training and oversight needed for such procedures.

Figure 1:
Graph of Location of Cosmetic Procedure by Provider (responders were able to choose more than one)

Figure 2:

Graph of Consumer Survey: Adverse Events by Provider (responders were able to choose more than one)

Figure 3:

Graph of Consumer Survey: Percent of Adverse Events Stratified by Dermatologists, Plastic Surgeons, and Non-Physicians (Responders able to choose more than one)

Figure 4:
Consumer Motivating Factors for Choosing a Physician versus Non-Physician

Figure 5:
Physician Survey: Types of Complications Following Procedures Performed by Non-Physician

Figure 6:
Physician Survey: Suspected Reason for the Adverse Event When Performed by a Non-Physician

Table 1.

Demographics of Consumers

Descriptor	Percent
Gender	
• Female	• 95.4%
• Male	• 4.6%
Age	
• Under 30	• 0.1%
• 30–40	• 21.1%
• 41–50	• 24.4%
• 51–60	• 37.7%
• Over 60	• 16.6%
Employment Status	
• Full-time	• 69.0%
• Part-time	• 10.9%
• Unemployed	• 1.9%
• Homemaker/Retired/Other	• 18.1%

Table 2.

Consumer Survey: Scope of Cosmetic Procedures and Adverse Events

Procedure	Total Number N= 401	Non- physician Procedures N answered = 144	Physician Procedures N answered = 149	<i>n= total number of participants that experienced a complication</i>	<i>Percentage of total complications</i>
Laser hair removal	132 (33.0%)	71 (49%)	21 (14.1%)	20	12.58%
Injectable wrinkle-relaxing treatments	121 (30.3%)	19 (13.1%)	49 (32.9%)	26	16.35%
Microdermabrasion	120 (30.0%)	52 (35.9%)	120 (30.0%)	21	13.21%
Chemical peels	98 (24.5%)	34 (23.4%)	98 (24.5%)	12	7.55%
Laser and light treatment to reduce redness, improve skin tone, or improve scars	85 (21.3%)	20 (13.8%)	85 (21.3%)	19	11.95%
Injectable filler treatments	75 (18.8%)	11 (7.6%)	75 (18.8%)	22	13.84%
Varicose or spider vein treatments	72 (18.0%)	8 (5.5%)	72 (18.0%)	15	9.43%
Body sculpting (e.g. cryolipolysis, laserlipolysis, tumescent liposuction, ultrasound fat reduction)	60 (15.0%)	3 (2.1%)	60 (15.0%)	9	5.66%
Ultrasound, laser, light, and radiofrequency treatments for skin tightening and wrinkle-smoothing	50 (12.5%)	10 (15.3%)	50 (12.5%)	11	6.92%
Laser tattoo removal	6 (1.5%)	2 (1.4%)	6 (1.5%)	3	1.89%
Hair transplantation	3 (0.8%)	1 (0.7%)	3 (0.8%)	1	0.63%

Respondent can select multiple responses

Table 3.

Consumer Survey: Provider Performing Cosmetic Procedure (responders were able to choose more than one)

Provider	Number (%)
<i>Physician</i>	
• Plastic Surgeon	• N = 82 (33.1%)
• Dermatologist	• N = 80 (32.3%)
• Facial Plastic Surgeon	• N = 21 (8.5%)
• Oculoplastic Surgeon	• N = 2 (0.8%)
• I don't know	• N = 27 (10.9%)
• Other type of physician	• N = 36 (14.5%)
<i>Non-physician</i>	
• Aesthetician	• N = 117 (43.5%)
• Nurse	• N = 59 (21.9%)
• Spa staff (other than aesthetician)	• N = 32 (11.9%)
• Physician assistant	• N = 17 (6.3%)
• I don't know	• N = 27 (10.0%)
• Other type of non-physician	• N = 10 (3.7%)

Table 4.

Consumer Survey: Location of Cosmetic Procedure by Provider (responders were able to choose more than one)

Location	Physician Provider	Non-physician provider	Fisher's exact P-value *
Physician's office	127	32	<0.0001 *
Dental office	1	1	0.749
Nurse's office	0	9	0.002 *
Aesthetician's office	6	37	<0.001 *
Physician assistance's office	1	2	0.497
Spa	6	53	<0.001 *
I don't know	4	10	0.082

* statistically significant between the two groups compared

Table 5.

Consumer Survey: Statistically Significant Adverse Events by Provider (responders were able to choose more than one)

Adverse Event	Physician provider (N = 27 responded)	Non-physician provider (N = 23 responded)	Fisher's exact P-value
Discoloration	4 (14.8%)	10 (43.5%)	0.031 *
Burn	2 (7.4%)	8 (34.8%)	0.03 *

* statistically significant between groups