



# The new dilemma of plastic surgery and social media: a systematic review

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## Abstract

**Background** There is no doubt we are living in the era of social media, as dealing with the digital platforms on a daily basis has become inevitable. During the last decade, social media was used heavily for advertising and mass marketing purposes. The healthcare industry is a part of the rising trend of social marketing as physicians from different specialties are actively using social media for marketing, self promotion, and patient education and communication. However, we believe that the relation between social media and plastic surgery is much more complicated than we think. This relation is changing the practice of plastic surgery and fundamentally transforming the surgeon's concept as a 'healer' toward someone providing beauty services on demand. As a result, many surgeons are concerned about the ethical and professional consequences of this interaction. We have conducted this review to answer the following research question: how social media is influencing the practice of cosmetic surgery?

**Methods** Two sources of data were searched: PubMed (including MEDLINE), and EMBASE using the following search terms: "plastic surgery," "cosmetic surgery," "aesthetic surgery," "social media," "marketing," and "ethics." We used the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) as our basis of organization.

**Results** Cosmetic surgeons and surgeons with private practice are more likely to seek professional presence on social media, and in general, the social media presence of plastic surgeons is rising. Most of Twitter and Instagram plastic surgery-related content is not posted by certified surgeons. Most YouTube videos demonstrating cosmetic surgery procedures were of low quality, misleading, and biased. The use of social media increased acceptance of cosmetic procedures. Taking and posting selfie photographs significantly increased social anxiety and the desire to undergo cosmetic surgery. Finally, social media lead to unrealistic expectations among patients.

**Conclusions** Despite the failure to produce a solid definition of social media professionalism and the difficulty to control social media content, it is the surgeon's responsibility to understand the motives of each patient undergoing cosmetic surgery. Surgeons should be aware of the influence of social media on their patients. Patients with unrealistic expectations or with psychological disorders should be approached cautiously.

Level of evidence: Not gradable

**Keywords** Plastic surgery · Social media · Marketing · Ethics

## Introduction

The French philosopher and sociologist Jean Baudrillard first crafted the term 'hyperreality' to describe the effect of the media on our lives. Baudrillard argued that people consider what they see on television more accurate than their actual lives and experiences [1]. He thought that the post-modern media — mainly television — dramatically alters our perception of the real world. He believed the effect was enormous that he later declared 'the death of the real' a slogan for the post-modern laden society [1].

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With the skyrocketing of social media in the last ten years, even shocking terms like ‘hyperreal’ or ‘the death of the real’ would seem to underestimate the actual effect of the digital platforms. One could comfortably argue that social media is currently not only altering reality but also continuously and effectively creating it.

The use of the internet and social media in marketing and advertising nearly involved all the services and industries, and the healthcare industry is not an exception. For example, some studies reported that over 90% of patients would use search engines like Google to find a healthcare professional or check the online reviews about another [2]. On the other side, increasing numbers of physicians from different fields use social media for advertising and marketing purposes. This is true for most clinical practices, from psychiatry clinics to surgery clinics. However, the relationship between social media and aesthetic surgery is more complex and profound than advertising and mass marketing.

Giving the heavy visual nature of the internet in general and most social media platforms in specific, it was clear that social media and aesthetic surgery — with its inherently visual nature — are destined for a long-lasting catholic marriage. The role of social media in aesthetic surgery is not limited to marketing purposes: the platforms are actively creating and expanding the industry. Platforms with heavy and sometimes nearly exclusive visual content — Instagram and Snapchat, for example — have created a new version of happiness and self-satisfaction that is strictly linked to extreme and intense experiences. Social media created an extreme and unrealistic image of the ideal woman: a physical image of a woman who is always young and beautiful according to strict and specific market standards and sometimes specific body measurements. This unrealistic image was further enforced by the built-in ‘beauty filters’ in the social media mobile applications, the advances in photo-editing technology, professional photography, and the mainstream culture emerging from it; the ‘selfie’ culture, for example.

As a result, valid ethical and professional questions have been raised by the scientific society. Despite the failure to produce a concrete definition of social media professionalism or an ethical code to determine how plastic surgeons should deal with social media, there have been many thoughtful discussions about this ethical dilemma.

## Materials and methods

### Information sources, search strategy, and eligibility criteria

A PubMed (including MEDLINE) and EMBASE all-time search was conducted using the following search terms: “plastic surgery,” “cosmetic surgery,” “aesthetic surgery,”

“social media,” “marketing,” and “ethics.” We used the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) as our basis of organization (see Figure 1). Boolean expressions were used to create a complex search string that was utilized to conduct our search. We ran our search in May 2021 with the following inclusion criteria: (1) English language, (2) full-text available, (3) studies exploring social media use by plastic surgeons for self-promotion or marketing purposes, or (4) studies investigating any influence of social media on its users that could be related to the field of plastic surgery. We have excluded editorials, reviews, commentaries on previous studies, and letters to the editor unless reporting an observational study.

### Study selection and data collection process

Each author independently performed the search and removed the duplicates using EndNote (Clarivate Analytics). After filtering the studies based on titles, abstracts were then screened according to the aforementioned eligibility criteria. Finally, the remaining studies were screened based on full-text readings.

### Data items and summary measures

We have included all English articles evaluating the effect of social media on cosmetic surgery by studying the influence of digital platforms on surgeons and the public.

## Results

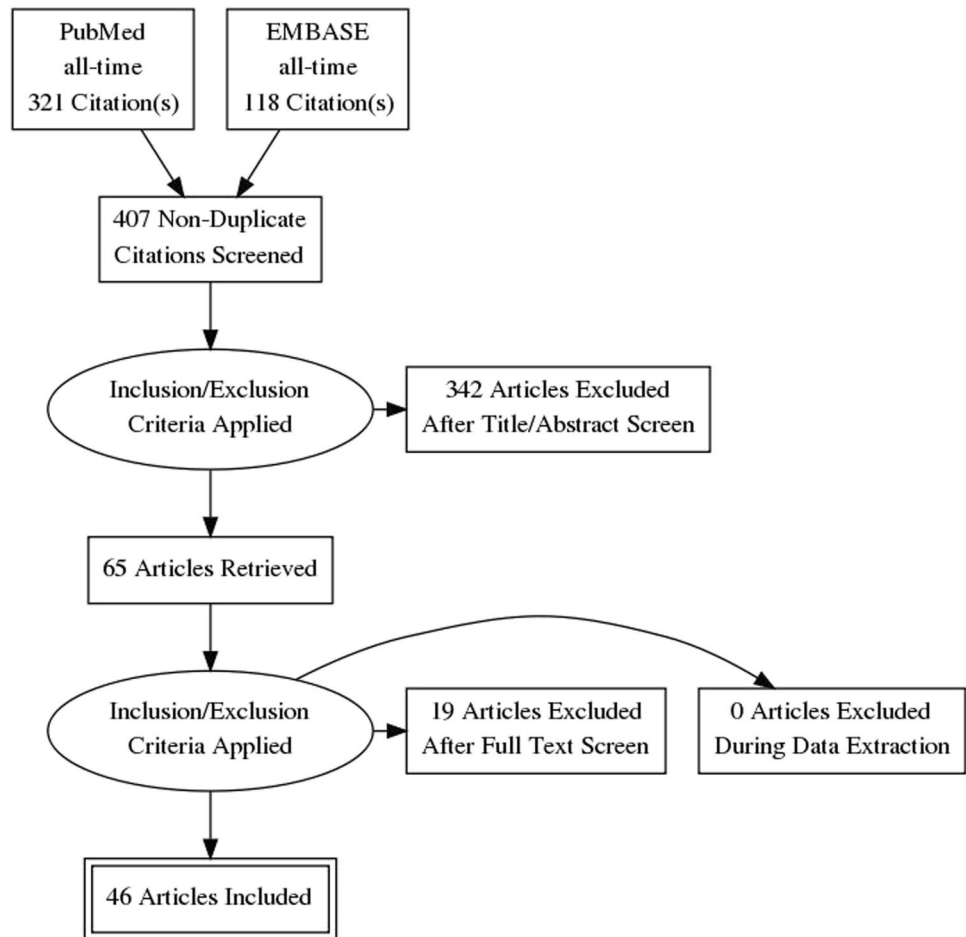
After the initial search yielded 407 results, 124 underwent abstract and full-text screening resulting in 46 studies included in our final analysis.

Table 1 summarizes the included studies chronologically, with the earliest at the top ( $n = 46$ ). For each study in our sample, we have summarized the study design and the conclusion.

### Synthesis of evidence

Upon reviewing the included studies, the authors could recognize three significant types among which several sub-types existed as we will discuss. The studies could be divided according to their focus into three types: patient-centered studies, physician-centered studies, and mixed studies targeting both physicians and patients.

Most of the surgeon-centered studies aimed mainly to quantify and analyze the presence of plastic surgeons on social media [3–11]. At the same time, other studies aimed to estimate the effect of social media on the practice of surgeons [12–14]. An essential subset of studies aimed to

**Fig. 1** PRISMA flow chart diagram

evaluate the plastic surgery-related content on social media. Six studies analyzed tweets [8, 15–19]. Three studies analyzed plastic surgery-related Instagram posts [20–22], and four analyzed YouTube videos [23–26]. In one interesting study, the authors created an Instagram account to monitor the content that attracts the most interaction from the followers [27].

Most of the patient-centered studies used surveys to evaluate the influence of social media on their behavior and decisions [14, 28–34]. Two studies used Google Trends to analyze what affects the public interest in cosmetic surgery [35, 36]. One study used Instagram photos to study the self photographs “selfies,” while another evaluated the facial features among famous Instagram models [37, 38]. A unique study from India extensively studies the effect of posting selfies on self-esteem, social anxiety, and the likelihood of undergoing cosmetic surgery [39]. Online reviews were also evaluated in three studies to understand the online influence on the public [13, 40, 41].

Surgeons heavily use social media for self-promotion purposes. Younger surgeons and surgeons with private practice are more likely to seek professional presence on social media, and in general, the social media presence of plastic

surgeons is rising [3, 4, 7, 9–11, 13, 42]. Most surgeons believe that social media positively influences their practice [4, 6, 28], and a return on investment analysis has proved this belief [43]. Online reviews were also found to influence the practice of cosmetic surgery [12]. Most surgeons thought it was appropriate to post perioperative photos and videos for marketing purposes [44]. Academic achievements or years of practice did not correlate with the surgeon’s popularity on the social platforms or Google front page placement [9]. The number of followers, however, significantly correlated with Google’s first page appearance [9]. Public figures significantly influenced the public toward or away from cosmetic surgery [36]. The public reach to cosmetic surgery-related online materials markedly increased over the past few years [45]. Scientific content fails to attract public attention on social media, while visual content is more rewarded and appreciated by users [27]. Most YouTube videos demonstrating or discussing cosmetic surgery procedures were of low quality, misleading, and biased when discussing benefits against risks of a procedure [23–26].

Moreover, most of the videos did not present a health care professional to verify the accuracy of the information presented to the public [23, 25]. Most of Twitter and

**Table 1** Summary of the studies included in our analysis

Author and date	Study design	Conclusion/comments
Wong and Gupta [1] (2011)	Seven cosmetic surgeons' (from seven US cities) web sites were compared and searched for the existence of Facebook, Twitter, or MySpace links and promotions	Cosmetic surgeons from Miami, Florida favored social media more the most with 50% promoting Facebook page and 46% promoting Twitter. Cosmetic surgeons from Beverly Hills promoted their television appearance more than others. The increase in Facebook memberships among cosmetic surgeons started in October 2008 and peaked in October, November, and December 2009 and stabilized afterwards. Twitter memberships started to increase in July 2008 and remained steady with 15 new memberships/3 months
Domanski and Cavale [2] (2012)	The "worth it" percentage for each aesthetic procedure was evaluated on aesthetic surgery website <a href="http://www.realself.com">www.realself.com</a>	Abdominoplasty scored the highest among other cosmetic surgery procedures
Vardanian et al. [3] (2013)	An anonymous survey on the use of social media among members of American Society of Plastic Surgeons	Surgeons with a primary cosmetic surgery practice were more likely to use social media. 33.8% reported a positive impact of social media on their private practice, while 1.5% reported a negative impact
Workmann and Gupta [4] (2013)	Analysis of smartphone applications for various factors including popularity, ease of use, and ethical compatibility with plastic surgery societies advertising guidelines	56.7% believed that the incorporation of social media into their practice is inevitable, and 52.1% considered social media an effective marketing tool
Mabvuure et al. [5] (2013)	Cross sectional study to evaluate the use of social media among consultant plastic surgeons in the United Kingdom (UK)	The most popular applications were those of visual nature allowing consumers to upload and edit their photos
Chang et al. [6] (2015)	A survey on Facebook use was distributed to plastic surgeons with and without professional Facebook pages	There has been an increase of social media use among UK plastic surgeons especially those with cosmetic surgery interest
Matera et al. [7] (2015)	A survey evaluating the impact of self-awareness, self-monitoring, media pressure, and peer attributions on the consideration of breast cosmetic surgery among women	Most Facebook users believed the platform had a positive influence on their practice
Montemurro et al. [8] (2015)	One survey directed to plastic surgeons from different countries. Another survey was directed to patients visiting plastic surgery clinics	Media pressure, self-monitoring, and peer attributions influenced women's interest in breast modification surgery through internalization of thin ideals
Ross et al. [9] (2015)	An anonymous survey was directed to patients during their initial cosmetic visit	95% of patients used internet to collect information prior to consultation. 46% of patients used social media to choose a specific doctor
Schlichte et al. [10] (2015)	The top ten most-commonly reviewed non-surgical treatments, top ten most-commonly reviewed surgical procedures, and top 5 most-commonly reviewed dental treatments, along with documented satisfaction rates in the medical literature for each treatment or procedure were recorded in table format and ranked by RealSelf "worth it" rating	85% of plastic surgeons thought that social media lead to unrealistic expectations. 45% of plastic surgeons thought their consultations became easier in the era of social media
Wen et al. [11] (2015)	Analysis of cosmetic surgery videos on YouTube.com	Most patients were highly active on social media using it for physician referrals, support groups, and self-education. Patient often shared their own experiences through social media platforms
Bramford et al. [12] (2016)	Prospective analysis of 2880 tweets containing the words "plastic surgery"	Social media sites such as RealSelf may offer information helpful to decision-making as well enable cosmetic treatment providers to build reputations and expand practices. "Worth it" ratings on RealSelf may, in fact, represent a more transparent view of cosmetic treatment or procedural outcomes relative to the high satisfaction rates documented in medical literature
		Most videos focused on the benefits of cosmetic surgery without addressing the potential risks associated with surgery. Tactics of persuasive communication (message sensation value) were used to attract viewers' attention
		70.6% of the tweets were posted by the public and only 6% by plastic surgeons. 61.3% of the tweets by plastic surgeons were about cosmetic surgery. 37% of plastic surgeons tweets were self-promotional

**Table 1** (continued)

Author and date	Study design	Conclusion/comments
McEvenue et al. [13] (2016)	A Google search was performed using publicly available lists of all plastic surgeons registered with the Royal College of Physicians and Surgeons of Canada (RCPSC) and the Canadian Society for Aesthetic Plastic Surgery (CSAPS)	85% of plastic surgeons had a social media profile. Young age and cosmetic surgery interest were significantly associated with higher likelihood of using social media
Chandwarker et al. [14] (2018)	Twitter influence scores for the topic search "plastic surgery" were collected in July 2017 using Right Relevance software	77% of top influencers were either plastic surgeons or facial plastic surgeons. 61% of influencers were either board certified or board-eligible surgeons. Most influencers were US based plastic surgeons
Dorfman et al. [15] (2018)	Analysis of 21 Instagram plastic surgery related hashtags	Plastic surgeons eligible for membership in American Society for Aesthetic Plastic Surgery (ASAPS) accounted for only 17.8% of top posts, whereas non-eligible physicians accounted for 26.4%. All non-plastic surgery trained physicians marketed themselves as "cosmetic surgeons."
Gould et al. [16] (2018)	A new practice without pre-existing clients was profiled	Social media has high return on investment
Montemurro et al. [17] (2018)	A questionnaire was directed to patients who sought consultation for primary breast augmentation Another questionnaire was answered by plastic surgeons	91.4% of patients said that they searched online and 61.4% searched in specific online groups for information on breast augmentation 72.5% of surgeons thought that over three quarters of patients gather information on the internet while only 20.3% thought that over three quarters of patients use social media for their information
Ward et al. [18] (2018)	Google Trends was used to access search data histories for three separate areas of interest: Kylie Jenner and lip fillers, Joan Rivers and plastic surgery, and rhinoplasty	The interest level in fillers increased by 30.3 points after Kylie Jenner received lip injections The interest level in plastic surgery decreased by 21.3% after Joan River's death
Wilson et al. [19] (2018)	Google Trends was used to analyze data associated with breast augmentation and associated search terms	There is a statistically significant correlation between Google search volume of "breast augmentation" and the annual volume of breast augmentations performed in the US
Aldosari et al. [20]s (2019)	Questionnaire directed to patients attending cosmetic clinics in Saudi Arabia	60.4% of patients agreed that surgeons' self promotion popularized cosmetic surgery. 65.7% agreed that before and after photos on social media made cosmetic surgery trendy. 54.1% sought cosmetic surgery because they wanted to look better in selfies
Alexander [21] (2019)	Analysis of tweets by male and female authors	45.8% and 43.9% of female and male authors promoted their work on Twitter
Chen et al. [22] (2019)	A web-based survey	The use of social media and photo editing applications may be associated with increased acceptance of cosmetic surgery
Chopan et al. [23] (2019)	Analysis of one million tweets with the keywords "plastic," "cosmetic," "aesthetic," and "reconstruction" surgery	Tweets containing the term "plastic" surgery trended toward negativity, while "aesthetic," "cosmetic," and "reconstruction" were more favorably regarded
Dorfman et al. [24] (2019)	A Google.com search was used to identify the top 20 websites of board-certified plastic surgeons. Social media presence of those surgeons was then quantified according to the number of followers	The number of followers on social media significantly correlated with Google front-page placement, while medical school ranking and years of practice did not correlate with Google front-page placement
Economides et al. [25] (2019)	An online survey was directed to board-certified plastic surgeons to evaluate their professional social media use and perceptions	Younger surgeons with private practice are more likely to consider social media an acceptable method of reaching patients
Kalandar et al. [26] (2019)	Analysis of tweets containing "#PlasticSurgery" or "Plastic Surgery"	Most tweets about cosmetic surgery were posted by the public. The majority of the tweets contained inaccurate information that could lead to misperception among potential consumers

Table 1 (continued)

Author and date	Study design	Conclusion/comments
Fan et al. [27] (2019)	Analysis of recent tweets by top 100 plastic surgery influencers on Twitter	68% of top plastic surgery tweeters were private practice surgeons. Non-physician tweeters are more likely to have promotional and less likely to have educational posts than board certified surgeons
Fan et al. [28] (2019)	An anonymous survey distributed by means of MTurk	33% of respondents follow plastic surgeons on social media. Social media ranked first as the most influential method for selecting a surgeon. Respondents considering a cosmetic procedure are five times more likely to follow a plastic surgeon
Janik et al. [29] (2019)	A two cohort study was conducted in aesthetic plastic surgery clinic and public department of plastic and surgery by surveying consecutive first-time patients	The use of social media can attract patients to cosmetic surgery practice
Mess et al. [30] (2019)	Analysis of how social media are used by plastic surgeons	Plastic surgeons preferred to focus their marketing efforts on Web sites rather than social media
Montemurro et al. [31] (2019)	All active members of the Swedish national aesthetic plastic surgery society were identified. Web pages, professional (LinkedIn), social media (Facebook, Twitter, Instagram) and video-sharing (YouTube) accounts as well as online patient forum (Plastikoperationsforum) mentions of the surgeons and their clinics were identified, and corresponding platform-specific metrics were analyzed	Younger surgeons were more likely to have a Facebook or Instagram account and to use two or more social media platforms
Nayyar et al. [32] (2019)	A survey to analyze the preferences of patients seeking common cosmetic procedures	The patients preferred medical information to be delivered by the surgeon through a live video on Facebook
Ward et al. [33] (2019)	Analysis of video quality and creator qualification of YouTube videos about facial plastic surgery procedures	Most videos did not include medical professionals to verify the discussed topics. The videos can be misleading and biased when discussing risks against benefits of the procedures
Bustos et al. [34] (2020)	Analysis of online reviews of plastic surgeons performing gender confirming surgery to assess the influence of social media on online reviews	92.9% of surgeons had at least one social media account. Surgeons with no academic affiliations and those in private practice had higher number of social media followers. A significant negative correlation was detected between years of practice and overall online ratings
Gray et al. [35] (2020)	Analysis of YouTube videos of 12 most common cosmetic surgical procedures using Quality Information for Patients score	The information presented in the video is low quality. The mean modified Ensuring Quality Information for Patients score for all videos was 13.1 of a possible 27, and 'nose reshaping' had the lowest score among all procedures
Cho et al. [36] (2020)	An online survey directed to plastic surgeons to evaluate social media use patterns, and their views on social media use	Plastic surgeons with a private practice are more likely to use social media for self promotion and branding compared to salaried surgeons (74.3% versus 28.3). Before-and-after photos, video testimonials, and patient reviews were accepted among most users
Eggerstedt et al. [37] (2020)	Analysis of cephalometric measurements of Instagram models	Cephalometric measurements of social media models were in agreement with historical ideals of beauty for Nostril axis (120.7°), Goode's ratio (0.6), Nasofacial angle (35.7°), Nasofrontal angle (130.9°), and the horizontal thirds
Eggerstedt et al. [38] (2020)	Analysis of selfie photos posted on Instagram	The study recommends implementation of a selfie photograph to the standard perioperative photographs to evaluate the effect of the intervention in the context of selfie photography

**Table 1** (continued)

Author and date	Study design	Conclusion/comments
Klietz et al. [39] (2020)	An Instagram account called “doctor.aesthetics” was created to evaluate the public’s interaction with different categories of posts	Scientific posts failed to attract attention, while “aesthetic” and “disease” posts showed high responses from the followers
Mehrizy et al. [40] (2020)	A retrospective study to evaluate the effect of a single positive review on a social website on the volume of cosmetic surgery cases in a clinic	After the review, the clinic has witnessed a growth rate of 30% compared to 10% annual growth before the review
Shome et al. [41] (2020)	An experimental study in India to evaluate the effect of selfie on the desire to undergo cosmetic surgery	Taking and posting selfie photographs significantly increased social anxiety and the desire to undergo cosmetic surgery
Siegel et al. [42] (2020)	Analysis of Instagram plastic surgery related hashtags	Of the physician posters, 51% were trained in plastic surgery, 30% in otolaryngology, and 19% in other specialties. Facial rejuvenation content was more likely to be posted by otolaryngologists rather than plastic surgeons, whereas body-contouring procedures were more likely to be posted by plastic surgeons. Nonsurgical procedures and injectables were more likely to be posted by non-physicians. Physicians without training in plastic surgery or otolaryngology were also more likely to post nonsurgical procedure-related hashtags
Ward et al. [43] (2020)	Analysis of YouTube videos discussing the most common cosmetic procedures on Google Trends	The videos showed high bias and low quality
Basa and Spiegel. [44] (2021)	Analysis of content on top 33 plastic surgery related Instagram accounts	Clinical pictures and patient posts were 42.78% and 41.94% of those sampled, respectively
Montemurro et al.[45] (2021)	A survey directed to patients consulting for primary breast augmentation	Over 5 years, patients who read about aesthetic surgery on social media increased by 29.1%
Othman et al. [46] (2021)	A survey was administered, including questions about demographics, familiarity, and utilization of face-editing applications, motivations in utilization and influences towards pursuing cosmetic procedures, and attitudes towards applications	Face editing applications influences the patient decision on undergoing a cosmetic surgery

Instagram plastic surgery-related content is not posted by certified surgeons [15, 19]. The vast majority of patients used the internet when searching for a specific doctor or cosmetic procedure [28]. Most of those patients prefer social platforms when looking for a cosmetic surgeon [46]. Furthermore, most patients reported that sharing perioperative photos and videos is appropriate and desirable [30, 32]. Additionally, most patients reported that before and after photos on social media made cosmetic surgery trendy [32].

The use of social media increased acceptance of cosmetic procedures [14, 47]. Taking and posting selfie photographs significantly increased social anxiety and the desire to undergo cosmetic surgery [32, 39]. Photo editing applications significantly influenced patients' decision to undergo cosmetic surgery [29, 47]. Half of the patients reported "looking better in selfies" as a cause for seeking facial cosmetic surgery [32]. Selfie photographs were suggested to be added to the standard pre and post-photography by one study [38]. Finally, social media lead to unrealistic expectations and misperceptions among cosmetic surgery patients [2].

## Discussion

### How it all started?

Plastic and reconstructive surgery covers a broad and diverse spectrum of clinical expertise, including hand surgery, burn surgery, microsurgery, and aesthetic surgery. This diversity is often misunderstood by the public as well as the primary healthcare providers. A survey conducted by Tanna et al. [48] revealed that a considerable percentage of internal medicine, family medicine, and pediatrics residents in the USA need further education in the scope of plastic surgery practice [48]. Another challenge for plastic surgeons is the overlap between their practice and other surgical specialties like orthopedic surgery, maxillofacial surgery, pediatric surgery and head, and neck surgery. Due to this overlap with other specialties and the misunderstanding of the practice by primary healthcare providers, plastic surgeons face the risk of being excluded as providers for many plastic surgery procedures.

Considering the aforementioned factors, besides the fierce competition in the market, many plastic surgeons were urged to engage with patients online using social media as a convenient method to achieve such a goal [49]. Since more patients increasingly rely on social media platforms for decision-making regarding plastic surgery procedures [50], it seems like it is a win–win situation.

However, this extensive interaction between social media and the aesthetic industry resulted in many ethical and professional concerns starting from 'What to post and what not to post?' question to 'How far should I fulfill my patient's

wishes?' and finally 'Is it ethical to operate on a patient heavily influenced by social media?'. The debate is complex and has reached a point where the plastic surgeon is facing an identity crisis where the concept of the surgeon as a 'healer' is shifting toward someone who is providing beauty services according to the market demands [51].

When coming to choosing a plastic surgeon for either a surgical or non-invasive procedure, social media platforms are the public's preferred choice, according to a survey conducted by Fan et al. [31]. The total number of followers on social media platforms is associated with higher Google first page placement of the surgeon while the medical school or years of practice are not, meaning that the private practice is becoming more dependent on social media influencing rather than the actual expertise of the surgeon [9]. The same study conducted in 2018 revealed that only 19.6% of plastic surgeons have no presence on social media platforms [9].

Before exploring what is acceptable to post on social media, an important question needs to be answered: who is posting about plastic surgery and what is posted?

Board-certified plastic surgeons posted only 6% of the "tweets" related to plastic surgery according to prospective analysis of 2880 'tweets,' while the rest of the posts were either by the public or non-board certified surgeons [19]. Another analysis by Kalandar et al. [15] revealed that most tweets about cosmetic surgery are posted by the public. Moreover, most of the analyzed tweets contained inaccurate information that could lead to misperceptions among the potential consumers [15].

A prospective analysis of Instagram, Youtube, and Facebook using key phrases 'Plastic surgery' and '#Plastic\_Surgery' revealed that 68% of posts contained images of attractive women and 22% contained videos; only 16% of these posts were for educational purposes, while shaming was seen in 21% of posts and was mainly related to public figures [52]. Photo and video content were highly rewarded with likes, shares, comments, and views, and in general, the ten most potent attention-drawing motives were jokes, attractive female plastic surgeons, celebrities, personal stories, provocative surgeries, videos or photos of surgery, sex, shaming, and patient education [52]. In contrast, educational and scientific content consistently failed to draw public attention [16].

### What do plastic surgeons think?

The vast majority of plastic surgeons advertise; however, the most predicting factor of social media advertising is solo practice with a cosmetic focus [53]. Academic affiliations appear to play a role; one study reported that 71.4% of non-academic surgeons used social media compared to 41.4% and 29.5% for university-affiliated and academic surgeons, respectively [31]. Cosmetic surgery is the primary,



and sometimes the only, practice for many plastic surgeons [4]. The visual nature of both cosmetic surgery and social media makes the combination between them very tempting, natural, and sometimes unavoidable. Half of the plastic surgeons use digital platforms to promote their professional practice. Although other primary visual social platforms like Instagram and Snapchat may seem more suitable for cosmetic surgery marketing purposes, Facebook is the preferred platform for plastic surgeons [4]. This professional preference is probably a result of the unparalleled popularity of Facebook, with a striking 2.8 billion active users compared to 1.4 billion users for Instagram and only 0.5 billion users for Snapchat [54]. On the other hand, Twitter, another popular platform, is also used frequently by plastic surgeons for academic rather than marketing purposes [55, 56].

When asked about the motives behind using the social platforms in marketing, over half of the plastic surgeons believe that the social platforms provide them with practical marketing tools that are inevitable in today's practice, while only 21% said that the platforms provide them with an effective tool to communicate with their patients [4]. In another study, 73.1% of cosmetic surgeons reported using social platforms for patient acquisition, and 60% used the platforms for branding [42]. Reasons for nonuse include concern about time consumption and patient privacy, and institutional prohibition [42]. Becoming too accessible and having doubts about maintaining professionalism on social media are other causes for nonuse [4].

Most plastic surgeons believe that their professional presence on social media positively influences their career [4, 53]. In one study, 33.8% of cosmetic surgeons believed social marketing positively impacted their private practice, while only 1.5% thought that the social platforms negatively influenced their practice [4]. In another study, 89% of cosmetic surgeons believed that the social platforms helped them “practice development” [53]. As the industry expands on social media, it is becoming hard, if not impossible, to control what goes online. Live broadcasts of aesthetic plastic surgery are becoming more ‘trendy’ on Youtube, Instagram, and Snapchat. Most of those videos carry no educational value about the standard patient care or the procedure but instead are used as entertaining or commercial material [57]. Patient confidentiality is also rising as an essential issue in the era of digital marketing. Even with the patient consenting to use their photos for marketing, we could never know if the patients understand the implications of these photos on their lives in the future because it is impossible to tell if the patients were genuinely educated before consenting. Even with censoring the patient's face, the patient's identity is still at risk of being exposed since the surgeon is known and possibly the approximate time and place where the procedure took place. Despite that, an online survey targeting plastic surgery trainees and members of the American

Plastic Surgery Association revealed that most plastic surgeons validated the use of before-and-after photos, video tutorials, and patients' reviews on social media for marketing purposes [42].

Establishing a universal code of online professionalism for the plastic surgery society seems to be challenging. The published guidelines of the American Medical Association in 2011 and the Federation of State Medical Boards define professionalism as “the ability to communicate and interact in a respectful and productive manner” [49]. However, there are considerable differences in understanding what is respectful and productive from one individual to another and from one culture to another. Moreover, labeling online content as inappropriate is quite challenging, even for straightforward cases. Social media has created an illusion that the whole world has the same values, beliefs, and standards, which is doubtful, and this is a great challenge to create such a valid universal code of conduct.

### **What do patients/consumers think?**

Nevertheless, what do the users of social media — and the potential consumer of the aesthetic industry — actually think? Do they agree to the current trends on the digital platforms? Moreover, how do they estimate the influence of social media on the industry?

A cross-sectional study conducted in Saudi Arabia — a conservative Muslim country — revealed that over 65% of the study participants agreed to post before-and-after photos on social media, and over 50% agreed that cosmetic television programs impact the trend of plastic surgeries [32]. Another cross-sectional study surveying 100 patients in an aesthetic surgery practice in the USA reported that most patients expressed interest in seeing posts on social media platforms related to before-and-after photos. On the other hand, articles about plastic surgery held the slightest interest among patients [58]. Thus, there seems to be an agreement among both patients and surgeons on using social media platforms to post visual materials about the practice.

### **What are the patients' motives, and how to address them?**

As it seems to be complicated or even impossible to control what the surgeons post on social media, can we control the practice? Is there an ethical code that determines when to operate on the patient and when not to do it?

The American Society of Plastic and Reconstructive Surgeons defines aesthetic surgery as ‘any surgical procedure in which the primary goal is beautification or improvement of appearance above and beyond what might be considered average or normal’ [59]. This definition differentiates between plastic and reconstructive surgery and aesthetic or

cosmetic surgery: plastic and reconstructive surgery aim to restore what is normal, as in scar revision for a patient with a scar in his face, while cosmetic surgery aims to what is beyond ordinary. There are two reasons for performing aesthetic surgery: to satisfy the patient's desire and the other reason is to correct or prevent psychological disturbance in the patient [59].

Some patients would request an aesthetic surgery simply to look more beautiful, attractive, and appealing. Others may undergo cosmetic surgery for purely economic reasons as specific jobs are biased toward people with above-average looks. Moreover, some patients would choose to undergo cosmetic surgery. They are afraid of losing their jobs because they look older [59, 60].

However, a large percentage of patients are derived from deep psychological needs; most of these patients feel that they have an anatomic deformity that needs to be treated even if they are considered 'normal' by others [59]. Many of them could even be suffering from major psychiatric disorders that could not be treated by surgery [61]. Therefore, a competent plastic surgeon is expected to identify the signs of body dysmorphic disorder, polysurgical addiction, personality disorders, dysmorphophobia, or heightened narcissism not remediable with surgery [61]. Patients suffering from such disorders are doubtful to be happy or satisfied with the outcomes because they have unrealistic goals in the first place [62]. Moreover, patients with such psychological disturbances could have impaired judgment as their derives push aside any possible risks of complications or interactions of the surgery making their ability to consent to surgery questionable [63].

The decision to request cosmetic surgery is emotional and is strongly linked to body image [59]. Patients differ in their ability to control emotions; those capable of achieving a high degree of 'self-monitoring' have reasonable control over their body image thoughts, while patients with low self-monitoring were found to have a lower rating of body image [64]. Even those with psychological disorders could form some ego defenses [59], and they will not seek cosmetic surgery until those defenses fall.

Social media affect patients' self-esteem [47] and continuously attack their ego defenses, putting more pressure on emotional patients to request cosmetic surgery. In addition, visual platforms like Snapchat and Instagram have created and normalized unrealistic beauty standards through built-in filters and photograph (photo) editing features that allow users to soften wrinkles or alter the size of their eyes, lips, nose, and many other physical features before sharing self-images ("selfies") throughout social media [47].

As selfies are spreading rapidly, not only on social media but also in cosmetic surgery clinics, the rising phenomenon has come to the focus of attention of cosmetic surgery. Photographs taken from shorter distances "selfies" have a

natural tendency to distort the facial features [65]. One study compared facial and nasal indexes for selfies against third person photos to quantify the differences. The facial and nasal indexes were calculated by dividing the length over the width. The results confirmed that selfies significantly magnified both facial and nasal indexes. Moreover, facial nasal index (facial width/nasal width) was significantly lower in selfies than in third person photos, indicating that selfies selectively enlarge the nose relative to the face [65]. This distortion aberration was confirmed in another study, as selfies were found to increase the nasal size by 30% in males and 29 percent in females compared to orthographic projection camera [66].

The behavioral consequences of the selfie pandemic were evaluated by McLean et al., who found that adolescent girls who regularly shared self-images on social media, relative to those who did not, reported significantly higher overvaluation of shape and weight, body dissatisfaction, dietary restraint, and internalization of the thin ideal [67]. Another study revealed that social media might lead to lower self-esteem and higher acceptance of cosmetic surgery [47]. A third study reported that posting selfies on social media was also associated with a significant increase in the level of social anxiety, feeling of decreased physical attractiveness, and as in the previous studies, increases the desire to undergo cosmetic surgery [39].

Many plastic surgeons have recently reported clients requesting changes, which corresponded to what filters on social media applications could provide [68]. Furthermore, over 42% of plastic surgeons reported encountering patients willing to undergo cosmetic surgery to improve how they look in selfies posted on social platforms [66]. Thus, 'Snapchat Dysmorphia' is now used to describe patients who aim to look like their filtered selfies through cosmetic surgery. Although it could be early to validate such a term, the rising phenomenon has attracted the attention of plastic surgeons and psychiatrists [68].

## Conclusions

Although it seems complicated, if not impossible, to control the impact of social media on aesthetic surgery, the practice itself could be controlled. It is the surgeon's responsibility to understand the motives of each patient undergoing cosmetic surgery. Selecting patients is for the good of the patient and the surgeon. Patients with psychological disorders or patients undergoing many cosmetic procedures should be considered for psychiatric counseling. Patients willing to undergo such procedures should receive appropriate education about the procedures and their potential complications and consequences. Finally, the surgeon should never forget

the basic principle of ‘do no harm’ while selecting his/her patients for surgery.

**Author contribution** SMM searched the literature for relative publications. ASE was the major contributor in writing the manuscript. Both authors read and approved the manuscript.

**Data availability** Not applicable.

## Declarations

**Ethics approval** This is a review of literature. Tanta University Research Ethics Committee has confirmed that no ethical approval is required.

**Consent to participate** This is a review of literature. No consent is required.

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**Conflict of interest** Abdullah Sami Eldaly and Sarah Magdy Mashaly declare no competing interests.

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