

Beyond Aesthetics: How Non-Dermatology Clinicians View Botulinum Toxin: A Cross-Specialty Survey

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Abstract

Background Botulinum toxin (Botox) has become a popular choice for various uses in medicine, with rising acceptance among many different fields of medicine. Even as the use of botulinum toxin is being employed in increasingly diverse medical practices, several misunderstandings and ethical questions related to its use for cosmetic purposes persist. The opinions of non-dermatology practitioners can have a significant impact on public perception; thus, their perceptions of botulinum toxin are vital.

Objective To assess the knowledge, perceptions, and attitudes of the non-dermatological clinicians regarding the medical and cosmetic use of the botulinum toxin.

Methods Four hundred and eight (408) clinicians from various fields were enrolled in the study from October to December 2025. The study sample was selected via non-probability convenience sampling, excluding dermatologists, aesthetic doctors, and plastic surgeons. The data were gathered through a pre-tested Google form, and descriptive statistics were analyzed using IBM SPSS 26.

Results Out of 408 respondents, 70.6% were male. Social media was identified by 83.3% of participants as the primary source of cosmetic myths related to Botox. The majority (67.6%) regarded Botox treatment as a beauty salon-type service rather than a medically based process (9.8%). Conversely, 68.6% perceived the treatment as harmless as it does not necessarily produce an unnatural appearance. 76.5% believed cosmetic Botox use compromises a doctor's professional identity, and 46.1% considered its use unethical in individuals with poor self-esteem.

Conclusion Non-dermatological clinicians exhibit significant gaps in clinical knowledge, accompanied by varied ethical perspectives regarding Botox. The prevailing perception among these participants treats Botox more as a beauty-related service than a legitimate medical procedure.

Keywords Botulinum toxin; Botox; Medical ethics; Aesthetic medicine; Clinician perception.

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Introduction

Botulinum toxin (Botox) is a neurotoxin which is secreted by a bacterium called Clostridium

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botulinum. This is an anaerobic, spore producing bacterium.¹ Botox was originally detected in connection with the disease botulism but eventually it became recognized for its therapeutic benefits. The use of Botox for medical purposes dates back to 1980 when it was initially used for the treatment of strabismus while the possibility of cosmetic use was noticed in 1989.² In 2002, the FDA approved the use of Botox type A in cosmetic procedures.³ Following this approval, Botox became one of the most popular

procedures worldwide because of its application in both therapeutic and cosmetic dermatology.

In terms of pharmacology, Botox leads to the inhibition of acetylcholine release in the synapses between motor and muscles resulting in muscle chemo-denervation and subsequent relaxation of targeted muscles.⁴ In addition to being used in various cosmetic procedures, Botox also helps to manage several neuromuscular and autonomic disorders including cervical dystonia, blepharospasm, chronic migraine, bruxism, temporomandibular disorders, sialorrhea and spasticity in cerebral palsy.⁵ As for dermatology, Botox is used for reducing dynamic facial rhytids (for instance, glabella lines, frown lines, forehead wrinkles, crow's feet), treating hyperhidrosis, eccrine nevus, alopecia, psoriasis, Darier disease, bullous skin disease, pompholyx, Raynaud's phenomenon, rosacea-associated flushing, and hypertrophic scars.⁶ These multiple uses emphasize the importance of having scientific knowledge and clinical expertise among dermatologists and other medical practitioners in utilizing Botox.

The cosmetic utilization of Botox has increased immensely over the years. Millions of non-invasive cosmetic treatments are done each year around the world, with increasing attention being paid to physical appearance and youthful confidence. The same has happened in Asian countries as well, where there is an increasing demand for the cosmetic dermatology market.⁷ Myths associated with Botox are a result of misinformation that people receive via social media and misleading advertisements due to lack of knowledge.⁸

Studies have shown that these misconceptions are not just limited to the layperson, but healthcare professionals also demonstrate shortcomings in knowledge and attitude towards cosmetic use of botulinum toxin.⁹ A survey conducted by Imam *et al.* found significant gaps in knowledge about botulinum toxin among medical students in Karachi, Pakistan.¹⁰ Considering the rising demand of

aesthetic procedures in Pakistan, it is essential to evaluate attitudes and knowledge of practicing clinicians who may influence patient decisions and referral patterns.¹¹ This study has been intentionally carried out on non-dermatologist physicians at Pakistan Railway Hospital, Rawalpindi to assess their knowledge, attitude and perception regarding Botulinum toxin procedure across the domains of clinical legitimacy, ethical concerns, aesthetic outcomes, and media influence. The results from this study can help to identify these gaps in knowledge and guide towards future educational interventions to promote evidence and ethic-based use of botulinum toxin.

Methods

A descriptive cross-sectional survey was conducted by the Department of Dermatology, Pakistan Railway Hospital, from October to December 2025, after obtaining ethical approval from the Institutional Review Board (IRB No. 25/1042 dated 10.09.2025). Participation was voluntary, anonymous, and based on informed consent.

Inclusion criteria were clinicians, including consultants from different specialties (including internal medicine, surgery, pediatrics, gynecology, ophthalmology, and family medicine), medical officers, house officers and residents. Dermatologists, aesthetic physicians, and plastic surgeons were excluded to avoid professional bias.

A non-probability purposive convenience sampling method was used. The sample size was calculated using Cochran's formula, yielding a minimum of 384 participants; thus, data were collected from 408 doctors.

$$n = Z^2 \times p \times (1-p) / d^2$$

Where Z = 1.96 (at 95% confidence level), P=.50 (expected proportion), and d=0.05 (margin of error)

$$n = (1.96)^2 \times 0.50 \times 0.50 / (0.05)^2 = 384.16$$

An original, structured, self-administered questionnaire was designed in Google Forms comprising 18 items to assess perceptions, attitudes, and ethical viewpoints of clinicians regarding the use of Botox. The tool was designed based on extensive literature review of relevant articles. The questionnaire was then refined through a structured process assessing the content validity by expert dermatologists, purposively selected based on their clinical and academic experience in aesthetic medicine. A panel of three dermatologists reviewed the questionnaire to assess content validity, relevance and clarity. The iterative process was repeated for two rounds till consensus was achieved among the panel. Based on their consensus, ambiguous or redundant stems were removed from the questionnaire. Then the refined questionnaire was pilot tested on five physicians, selected through convenience sampling from the hospital setting (excluded from the final sample), to assess ease of understanding, and based on their feedback, minor changes in wording and formatting of questions were done. Both these steps together ensured face and content validity of the instrument.

Four key domains were assessed to explore non-dermatologist doctors' views about Botox treatment: (I) clinical legitimacy and professional identity, (II) ethical concerns, (III) aesthetic outcomes and perceptions of natural appearance, and (IV) media influence and commercialism related to Botox use.

Survey responses included multiple-choice, true/false, and yes/no based questions. The Google Form was distributed electronically via institutional emails and WhatsApp groups. Responses were manually entered and analyzed in IBM SPSS Statistics version 26.0 (IBM Corp; Armonk, NY, USA). Descriptive statistics summarized the data. Some items had missing responses; percentages were calculated on total respondents for each question. Since the study was designed as an exploratory descriptive survey, inferential statistics assessing association of outcomes with variables were not performed. Informed consent was taken prior to the start of the

study informing participants about the objectives of the study.

Result

Four hundred and eight non-dermatologist doctors took part in the study, the majority of whom were male (70.6%), while 29.4% were female doctors. Age of the participating doctors ranged from 23 to 70 years with a mean of 38.56 years (SD ±11.684). The participants from various specialties are shown in **Figure 1**. In the domain of clinical legitimacy and professional identity, most respondents (67.6%) recognized Botox as a beauty salon service, and 90.2% did not recognize it as a medical procedure. A significant proportion (72.5%) felt Botox is not a cosmetic luxury. There were 76.5% of respondents who believed a doctor's professional identity as a medical caregiver is compromised while offering Botox as a cosmetic procedure (**Table 1**). Nearly 40% of respondents thought Botox should be part of medical practice.

According to the responses regarding ethical concerns and patient vulnerability related to Botox use, 74.5% of participants felt Botox use in young adults is medically and ethically not questionable. There were 39.2% participants who agreed to the need for Botox as psychological help, while 35.3% disagreed. 69.6% of respondents did not believe there were any ethical concerns when physicians

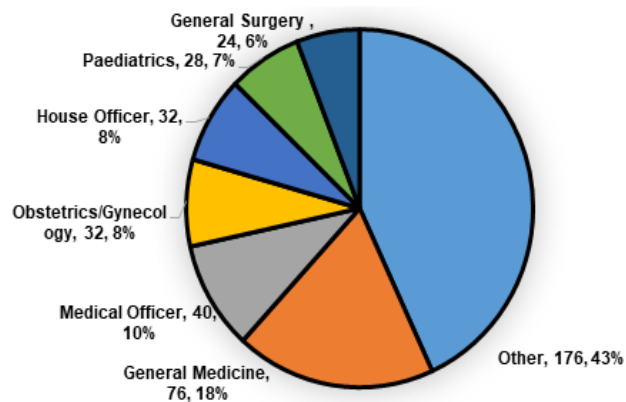


Figure 1 Distribution of study participants by medical specialty (n=408).

offered Botox, although 46.1% of the participants considered it ethically questionable. 84.3% denied the growing demand for Botox discourages the acceptance of natural aging.

In assessing perceptions related to aesthetic outcomes and natural appearance, most participants (68.6%) did not associate Botox with an unnatural or “plastic” look. Similarly, 66.7% stated that Botox does not hamper natural facial expressiveness. About 31.4% of respondents believed that Botox diminishes natural beauty. 38.2% felt it interferes with preserving individuality. Only a small proportion (12.7%) perceived that repeated Botox treatments disturb facial appearance or symmetry.

Most participants (83.3%) believed that cosmetic Botox popularity was due to social media trends, while 76.5% agreed that myths surrounding Botox

also stem from misinformed influencers.

Discussion

This study explored physicians’ perspectives regarding the therapeutic, aesthetic, ethical, and sociocultural dimensions of Botox use. The findings highlighted substantial variability in attitudes toward the legitimacy of Botox as a medical procedure and its ethical implications. A key finding in our study is that despite increasing global acceptance of botulinum toxin cosmetic use, the misconceptions identified in earlier studies in medical students of Pakistan still persist among practicing clinicians.

Participants in our study demonstrated doubt regarding the medical legitimacy of Botox, which raises concerns regarding the subsequent impact on professional identity by performing this procedure.

Table 1 Responses related to the four domains of study

| <i>Outcomes Related to Botulinum Toxin Perceptions</i> | <i>Response</i> | <i>No of Participants</i> | <i>%age</i> |
|---|-----------------|---------------------------|-------------|
| <i>I. Clinical legitimacy and professional identity</i> | | | |
| Injecting Botox is a beauty salon service | True | 276 | 67.6 |
| Injecting Botox is a cosmetic luxury | True | 100 | 24.5 |
| Injecting Botox is a medical procedure | True | 40 | 9.8 |
| Does offering cosmetic Botox compromise a doctor’s professional identity as a medical caregiver? | Yes | 312 | 76.5 |
| Botox treatment should be part of mainstream medical practice: | True | 156 | 38.2 |
| <i>II. Responses related to ethical concerns and patient vulnerability</i> | | | |
| Botox use in young adults (under 30) is medically and ethically questionable | True | 104 | 25.5 |
| Patients who seek Botox often suffer from body image disorders that need psychological help | True | 160 | 39.2 |
| Ethical concerns arise when physicians offer Botox purely for cosmetic enhancement | True | 124 | 30.4 |
| Is Botox use in a patient who has low self-esteem due to their appearance ethically questionable? | Yes | 188 | 46.1 |
| Does a growing demand for Botox discourage acceptance of natural aging? | Yes | 64 | 15.7 |
| <i>III. Aesthetic outcomes and natural appearance</i> | | | |
| Can Botox make people look “plastic” or unnatural? | Yes | 88 | 21.6 |
| Does Botox treatment hamper the maintenance of natural facial expressiveness? | Yes | 80 | 19.6 |
| Does Botox diminish a person’s natural beauty? | Yes | 128 | 31.4 |
| Does Botox interfere with preserving individuality? | Yes | 156 | 38.2 |
| Do repeated Botox treatments disturb facial looks and symmetry? | Yes | 52 | 12.7 |
| <i>IV. Media influence, trends, and commercialism</i> | | | |
| Cosmetic Botox is a trend driven more by social media than genuine clinical need | Yes | 340 | 83.3 |
| Are the myths about Botox a result of its promotion mostly by influencers and people without medical expertise? | Yes | 312 | 76.5 |
| Do you think that Aesthetic clinics prioritize profit over patient well-being in the promotion of Botox? | Yes | 260 | 63.7 |

Although Botox is medically classified as a pharmacological intervention,¹² many respondents (67.6%) in the present study perceived injecting Botox as a beauty service rather than a medical procedure (90.2%). These findings are consistent with physician surveys from Turkey and Australia, where clinicians demonstrated similar uncertainty and frustration about the overlap between cosmetic procedures and core medicine, potentially raising doubts about its medical legitimacy.^{13,14}

A similar study conducted among female medical students from different universities in Karachi, Pakistan, in 2018 showed mixed attitudes toward cosmetic Botox: while 70% supported beauty consciousness, nearly half (49.7%) still viewed Botox as unacceptable.¹⁰ Although students demonstrated partial acceptance of aesthetic enhancement, their views reflected limited clinical exposure. In contrast, our findings among experienced clinicians show even stronger reservations. Despite the several years since the 2018 study and increased global acceptance of aesthetic procedures, most doctors in our sample still viewed cosmetic Botox negatively. The majority of the participants in our study also did not consider botulinum toxin injections a legitimate medical procedure and viewed them as compromising to the professional identity of a doctor (90.2% and 76.5%, respectively). This suggests that the negative perception and mistrust regarding botulinum toxin injections seem persistent and deeply rooted among professionals early in their careers to even more seasoned ones and need further reforms to change this mindset among the healthcare community.

Only about a third of the participants (38.2%) showed willingness to incorporate botulinum toxin into mainstream clinical practice, showing a lack of knowledge about the application of botulinum toxin outside cosmetology. This could be a direct result of limited exposure during training, as studies show that comprehensive Botox information is rarely taught at the undergraduate level and is usually restricted to postgraduate dermatology and plastic

surgery curricula.¹¹ Formal aesthetic medicine teaching is still unstructured at the undergraduate as well as postgraduate level, and most clinicians rely on workshops and short courses for hands-on training, which creates a variability in knowledge and attitudes. This underscores the need to develop formalized aesthetic medicine curricula to improve the understanding and perception of cosmetic procedures throughout the medical education system.

Despite the negative perceptions about Botox as a medical procedure, a majority (74.5%) consider administering Botox to patients younger than 30 years of age as ethically sound. Multiple studies have shown Botox's increasing role in preventing early facial aging, where long-lasting reduction of crow's feet, especially in younger individuals, can be achieved by introducing Botox for early, pre-symptomatic benefits.¹⁵ Participants' acceptance of Botox may reflect its increasing recognition in preventative medicine.

In our study, 39.2% of participants were of the view that patients opting for Botox often have a history of body-image disorders, while 46.1% agreed that Botox use by individuals facing social pressure is a common ethical concern. In contrast, a cross-sectional study from Iran showed a contrasting perspective, where people receiving Botox treatments had lower levels of neuroticism, higher conscientiousness, and fewer symptoms of body dysmorphic disorder, disputing the common misperception.¹⁶ They also described an improved physical and psychological state of life following the Botox treatment. This is also corroborated in an umbrella review by Hemsworth *et al*, which highlighted that aesthetic medicine aims to improve both quality of life and self-esteem of patients.¹⁷ In support of our studies' findings, another study found that people with low self-esteem do seek cosmetic procedures.¹⁸ While doctors in our study show concern about the psychological vulnerability of Botox seekers, these studies suggest that these concerns are perhaps not universally applicable, and

careful psychological assessment of patients opting for Botox should be tailored to individual needs.

Most participants had a positive view about Botox aesthetic outcomes. The majority (68.6%) believed that it does not create an unnatural appearance, while 66.7% mentioned that it does not decrease facial expressions. A global survey across 28 countries also showed similar findings, where 63% of respondents and 76% of physicians included in the study did not consider unnatural-looking results to be a hurdle to acquiring the treatment.¹⁹ Despite this predominant perception of our study participants, some participants expressed that Botox can sometimes decrease natural beauty (31.4% of participants), may change individuality (38.2%), and repeated treatments can alter facial symmetry (12.7%). These concerns align with findings in another global survey, which highlights participants' doubts about aesthetic authenticity after treatment with botulinum toxins.²⁰ Modern aesthetics, however, is now taking a turn and focusing more on preserving natural expressions along with natural beauty by personalized botulinum toxin treatment plans and individualized dosing.²¹ The majority of our participants (84.3%) agreed that using neuromodulators does not undermine appreciation for natural aging, suggesting that despite Botox's popularity and societal pressure for beautification, aging naturally remains important for most.

Most of our study participants (83.3%) agreed that the increase in botulinum toxin popularity among the masses has primarily been achieved through social media clout rather than true clinical advice and need, while 76.5% believed that myths about Botox are also a result of social media influence. Digital marketing has reshaped the narrative around cosmetic procedures, normalizing the use of botulinum toxin, especially among younger populations.²² While social media enhances awareness about medical issues and procedures, it can also sometimes lead to unrealistic expectations and distorted beauty standards in society.²³ To minimize these negative influences and to close the

gap between medical knowledge and public understanding about botulinum toxin, there is a need for collaborative efforts between professional healthcare organizations and credible influencers to promote accurate, evidence-based content so the portrayal of Botox remains ethical and accurate.²⁴ Similarly, due to social media stigma, some medical caregivers also believe that offering aesthetic procedures might compromise their legitimacy.²⁵ This underscores the need to reframe aesthetic dermatology and the use of neuromodulators as an extension of holistic regenerative medicine.²⁶

Conclusion

This study assessed the knowledge, perceptions, and attitudes of clinicians other than dermatologists towards the medical and cosmetic uses of botulinum toxin. From the results obtained, there have been significant gaps in the knowledge of some clinicians about the medical acceptance and use of botulinum toxin for cosmetic purposes. While most clinicians had ethical concerns, others acknowledged the advantages of using botulinum toxin for therapeutic and cosmetic reasons. Some of the misconceptions associated with the use of botulinum toxin arise from the influence of social media which creates myths and biases about it. These findings highlight the need for educational interventions to bridge knowledge gaps and ensure ethical and evidence-based use of botulinum toxin among non-dermatologist clinicians.

Strengths and Limitations

To the best of our knowledge, this is one of the first studies assessing perceptions of non-dermatologist physicians across multiple specialties in Pakistan, providing a unique perspective on the knowledge attitude gap among clinicians. The diverse sample of 408 physicians provides a broad and representative overview of attitudes across different levels of clinical experience. Additionally, perception of botulinum toxin was assessed through multiple angles such as clinical legitimacy, ethical concerns,

aesthetic outcomes, and media influence to gain a holistic comprehensive view rather than knowledge alone.

This study was limited to a single location, and the clinicians reported their own attitudes, which could introduce bias. The study analyzed only descriptive statistics, associations between demographic variables (such as specialty, years of experience or gender) and perceptions were not explored. Additionally, the questionnaire was not developed using a formal Delphi technique, which may limit the strength of the content validation process. Future research could include multiple centers and analyses of different specialties to allow for in-depth analysis.

Recommendations

The misconceptions related to cosmetic use of botulinum toxin can be addressed by introducing a structured aesthetic medicine curriculum into undergraduate and postgraduate training. Additionally, we recommend reframing the use of neuromodulators as an extension of holistic and regenerative medicine in the healthcare community. Dissemination of accurate social media information among the public can also help improve the negative biases. This approach can help bring together cosmetic and clinical practices, ensuring that patient care is based on medical evidence instead of assumptions spread through social media.

Declaration of participant consent Authors certify that they have obtained all appropriate participant's consent.

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Author's contribution

NG: Substantial contribution to study design, acquisition of data, questionnaire development and drafting/writing the manuscript.

LRF: Substantial contribution to conception and methodology, critical review of the manuscript.

FS: Substantial contribution to analysis and interpretation of data, manuscript writing and critical review it..

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