



Integrating Nail Esthetics with Clinical Knowledge: A Contemporary Perspective

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Abstract: The article considers the integration of aesthetic practices of nail care with clinical knowledge in order to avoid risks to the health of the nails by their growing popularity within the beauty industry. This paper identifies the principal issues connected with modern practices such as gel polishes, acrylic extensions, and nail art and argues for an interdisciplinary concept combining Dermatology and Aesthetics. The relevance is based on how fast the market for nail services is growing, and more complications such as onycholysis allergic reactions and infections are due to improperly performed procedures. The scientific novelty consists of a systematic analysis of aesthetic tendencies and clinical risks that lead to recommendations for safe practice. This was gleaned from analyzing eight sources comprising market reports, clinical studies, and technology reviews. The key results show that the addition of clinical knowledge to nail beauty requires; 1) the creation of strict guidelines for instrument sterilization; 2) training of practitioners in safe practices, thinking about the structure of the nail part; 3) developing composite materials with reduced toxicity (for example, acrylates). It has been found that even "soft" ways, like taking off gel polish, make microcracks if done badly. Customers need to pick licensed shops that follow clean rules and do not use fake coats in a way that stops the nail plate from getting thin. The outlook for the industry's growth lies in dermatologists and manicurists working together to diagnose systemic diseases early based on manifestations through nail changes. This should serve the needs of podiatrists, dermatologists, nail service specialists, cosmetic product developers, and clients

who want a safe mix of aesthetics and health for their nails.

Keywords: nail aesthetics, nail health, gel polishes, acrylic extensions, nail art, onycholysis, nail infections, allergic reactions.

INTRODUCTION: Nail aesthetics include manicures, pedicures, gel polishes, and acrylic extensions. The reason for the trend of nail art design becoming popular is mostly the advent of social networks like Instagram and TikTok, where fashion trends spread like wildfire and users get inspired to try different things in their looks. Besides, nail aesthetics gives quite a meaningful opportunity for rather symbolic self-expression so that people can highlight their individuality meets modern criteria of style and looks well-groomed. Among all these options, gel polish tends to be the most requested due to its durability and creativity. If statistics mean anything, industry measures prove that global manicure markets will grow from USD 25.76 billion in 2025 to USD 36.27 billion by 2032 [1]. The popularity of aesthetic procedures is closely linked to general health issues since nails have a dual role as both ornaments and protectors of the distal phalanges against mechanical injuries. Conditions affecting the nail plate, matrix, bed, and surrounding tissues are generally associated with systemic disorders in an individual. Respiratory system disease will lead to yellow nails; chronic obstructive lung disease will give yellow nails. The aesthetic practice does very much for nail health, though appealing to many. Poor application of gel polishes or removal not done by the book can cause onycholysis - separation of the nail from the bed. High-quality material prevents infection and allergy possibilities. Nail aesthetics, therefore, need clinical input to make sure that the procedures are safe and to mitigate any associated health risks, which in turn reinforces the balance that ought to exist between unaesthetic beauty and physiological well-being.

MATERIALS AND METHODOLOGY

In preparing this article, eight sources were reviewed, which show the link between aesthetic nail care practices and clinical knowledge. Specifically, the Fortune Business Insights market report [1] indicated the worldwide expansion of the nail services industry, underlining the hybrid product needs like NeoNail gel

polishes [3] that show both durability and low impact on the nail plate. The work by S. Soliman [2] stressed new protocols of specialized nail clinics that should highlight the integration of cosmetic procedures into diagnostic algorithms for treating onychomycosis and trauma.

Practical guidelines, including Bonaza's recommendations for acrylic gel nail extensions [4], have demonstrated the technical nuances of the procedures, requiring consideration of the nail anatomy [6] to prevent delamination and inflammation. The work of D.M. Ceballos et al. [5] has identified the risks of exposure to toxic pigments in varnishes, which contrasts with marketing claims of the "safety" of the products [3], emphasizing the importance of clinical monitoring. The study of S.A. Saleah et al. [8] has introduced the method of optical coherence tomography to assess structural changes of the nail after nail art, bridging aesthetics and evidence-based medicine.

The methods used were comparative analyses of market trends [1] and clinical data [2, 7], systematic reviews of technological innovations [8], and practical guidelines [4]. Content analysis of scientific articles [5, 7] helped us to determine the main contradictions between aesthetic demands and biosafety requirements; therefore, a critical synthesis of recommendations [2, 6] proved the need for educational programs for masters on the basics of dermatology.

RESULTS AND DISCUSSION

Modern trends in nail aesthetics show stable interest growth in this area due to social networks and fashion trends that ensure desired self-expression along with care for appearance. Among the most popular techniques are gel polishes, acrylic nails, extensions, and complex artistic designs. Figures 1 and 2 show examples of nails using gel polishes and acrylic nails. These methods became mainstream because of their aesthetic appeal, durability, and the possibility of individualization, which make them a preference between professionals and customers.

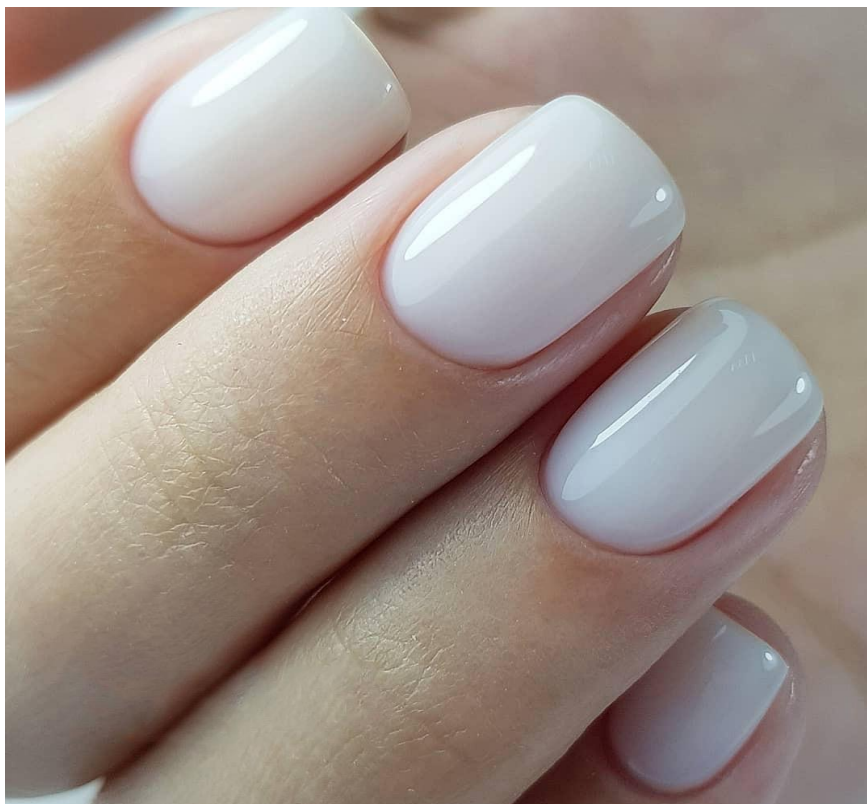


Fig. 1. Nails with usage of gel polish [3]



Fig. 2. Nails with acrylic extensions [4]

Gel polishes rule the domain of nail polishes within the nail industry because they stay to hold rich color and shine for about 2-3 weeks without chipping and retaining quality value. This process attracts people who like practicality and prefer to spend little time on the upkeep of a well-groomed look for nails. Acrylic nails and extensions, by consequence, give you a possibility

to change the length and shape of the nail plate; this holds special meaning in the trend's context that is promoted by influencers, celebrities, Instagram, and TikTok all together. These techniques give strength as well as durability; hence, these techniques are opted for expressive, long-lasting results.

Complex artistic designs, including hand painting,

appliques, rhinestone, and other decorative elements, represent the highest possible level of creativity in nail aesthetics. Such techniques are mostly sought after by the youth, which uses manicures as a means to express individuality and stay tuned to the latest trends. Gel polishes, acrylic nails, extensions, and complex artistic creations have become extremely mainstream because of strong social media influence coupled with fashion waves. Instagram, TikTok, and Pinterest are major places for technique hype where visually pleasing designs and methods can be showcased. Users share their photos and videos of nails with enthusiasm, which gives ideas and inspires others to try the same type of style. It shows how social media helps in the quick spread of nail trends for more reach. Fashion trends are mostly a play of celebrities and influencers, which greatly trickles down to the popularity of nail aesthetic techniques. Most times, when celebrities like Kylie Jenner or Cardi B flaunt their nails with a particular design, an upsurge in interest about the style follows. Such occurrences add up to the expansion of the nail services market, as per the data [1]. It indicates that growth not only puts into perspective more professional service demand but also stimulates interest in DIY nail care through social media.

Social media shares in the popularization of nail aesthetics as it spreads information on new techniques and products. Applying techniques by having various DIY tutorials shared on platforms such as TikTok makes the practice of nail aesthetics much more spreadable

among people. They can learn and practice things like applying gel polishes or making acrylic nails at home. All this leads to an emerging interest in professional nail care services and products and the desire of most individuals to get salon-type work done at home. Thus, social media, along with fashion trends, has an important contribution to the popularization of nail aesthetics, making them visible, accessible, and sought after in modern society. Clinical aspects of nail health are an important element to understanding what effect aesthetic practices have on their condition, linked to the rest of the article, discussing the popularity and trends in nail aesthetics. The basics of the anatomy of the unit are necessary to be understood to know how various procedures can affect its structures. The nail unit includes the nail plate, matrix, and nail bed [2]. The nail plate, which represents the actual nail, is made of keratin and covers the distal phalanges of the fingers. It is made inside the matrix, an area located at the base of the nail under the skin where the cells that form the plate are produced. The plate is then firmly attached to a “bed” that lies just underneath it. This bed contains a lot of blood vessels as well as nerve endings, thus providing nutrition and sensitivity, respectively, to this structure, which is shown in Figure 3. These structures can get affected by cosmetic procedures like nail extensions or gel polish. If these procedures are not performed well, then they may cause pathological conditions, such as damage to the matrical or bed, leading to some clinical disorder.

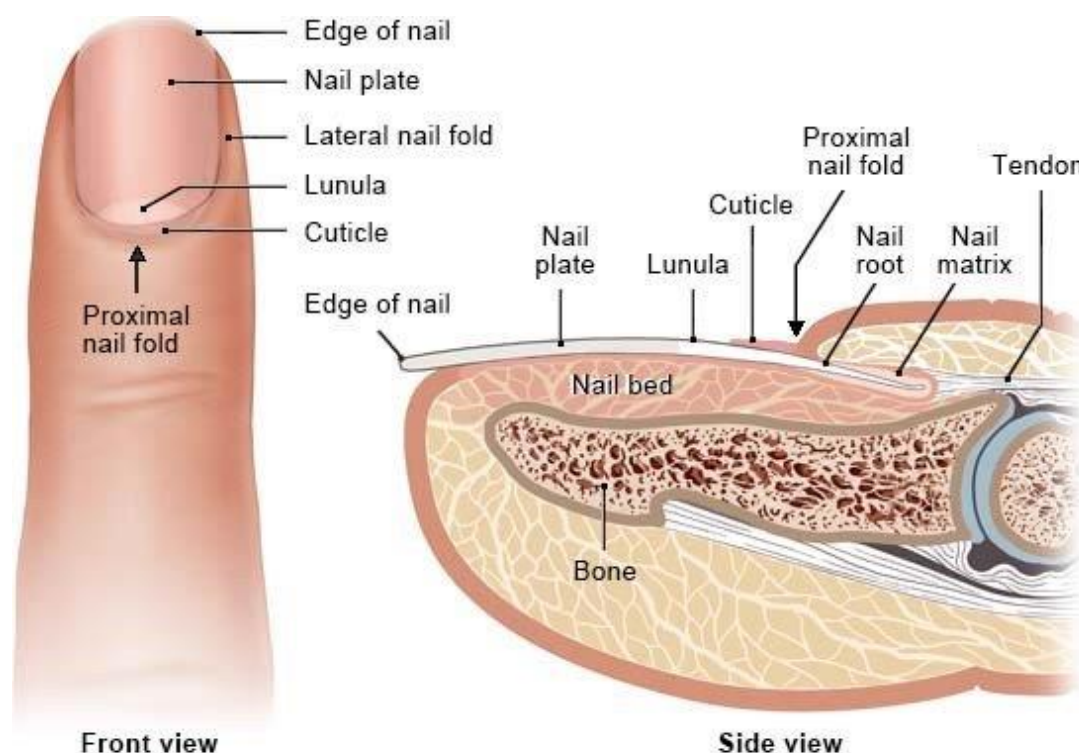


Fig. 3. Structure of the nails [6]

Problems related to nail health are typically onychomycosis, psoriasis, paronychia, and onycholysis; these issues will depend both on intrinsic factors and the effects of some cosmetic practices. Onychomycosis is the most prevalent condition concerning a nail plate, as seen here [7]. Psoriatic nails may present with psoriatic disease, causing pitted indentations, thickening, or discoloration of the plate—that must be differentiated from similar-appearing damage for proper treatment. Aesthetic procedures cause microtraumas that result in bungled fold inflammation or paronychia by allowing bacterial or fungal entry. Manual trauma, in addition to chemical allergic reactions to nail polish, could also cause separation between a nail plate and its bed due to improper artificial material removal. Many medical conditions can affect the nails; however, it is primarily their involvement that causes pain and loss of aesthetics that leads to medical treatment.

Nails hold value as signs of systemic diseases, stressing their clinical importance and linking this with the next part of the article dealing with how aesthetic care helps health. Changes in nail conditions may reflect body pathologies: for instance, yellow nails may show a

disorder in the respiratory system, chronic obstructive pulmonary disease comes to mind; white spots normally associate with a deficiency of zinc. Koilonychia or concave shape may typically denote iron deficiency anemia. These examples prove that nails are not just an area of aesthetic concern but a key diagnostic landmark that requires clinical consideration. Aesthetic practices for nails, specifically gel polish and acrylics, as well as their application and methods of extension, mainly contribute to nail health the best way, provided that hygiene standards and clinical recommendations are compatible. This, therefore, links up the discussion below about the popularity of these methods along with anatomical features regarding the nail unit. A high risk due to poor salon hygiene is infection. Bacterial and fungal infections like onychomycosis or paronychia may result from unsterile tools or shared materials. This emphasizes cross-sterilization care when one comes into contact with multiple items. In addition, allergic reactions to chemicals in nail products pose another serious hazard. Many polishes, glues, and other manicure supplies contain chemicals such as acrylates, formaldehyde, and toluene, known sensitizers that cause contact dermatitis in sensitive users. There is another serious issue, which is mechanical damage to

the nail plate, that comes from the improper removal of coatings. Improper removal of gel polish nails or acrylic nails- say, with aggressive methods like scraping- can cause onycholysis, the condition where the separation occurs between the nail and the nail bed. It not only makes the appearance of the nails worse but also brings a risk of infection as it provides an entrance for pathogens. In a study conducted with optical coherence tomography, most people who removed gel polish nails by themselves without any professional help faced issues like microcracks and thinning of the nail plate within just 72 hours post-procedure [8]. These factors highlight how important correct removal techniques are in minimizing damage.

Clinical knowledge should be factored into nail beauty for successful applications that ensure the safety and health of the clients and nail artists. This relates to previous discussions on how beauty practices affect the health of nails- in addition to needing to comply with hygiene standards. Key among them are rigorous sterilization and hygienic measures of instruments in salons. Poor processing of instruments may aid infection transmission- like nail infections and reveal the importance attached to disinfection protocols.

Basic nail anatomy and safe work practices should also be imparted to nail technicians. With an understanding of the structure of the nail unit, a technician can ensure that there is no matrix or nail bed damage during coating services, extensions, or other related procedures. Safe practices include the correct use of instruments and materials to ensure that mechanical injuries and allergic reactions do not occur.

The relationship with dermatologists and podiatrists is very important in bringing clinical know-how into nail aesthetics. Dermatologists help pick safe products and techniques and help fix issues like allergies or infections. Podiatrists focus on how to stop and fix problems that come from pedicures, like nails growing into the skin and foot infections.

Clients who want to keep their nails healthy, along with aesthetic procedures, can take some recommendations, which should be based on the clinical knowledge and research discussed in the above

sections. These pointers will help minimize risks related to infections, allergic reactions, and mechanical damage that may occur due to a lack of hygiene or improper nail care.

Salons should be licensed and maintain high standards of hygiene. Only licensed salons are obligated to ensure the strict sterilization of instruments as well as a clean working area; this reduces the risk of infections like onychomycosis and paronychia. Clients should look for licenses and certificates, above which general cleanliness in the salon plays a major role, including the tools' condition and disposability. All these will help in picking establishments that further reduce cross-infection and other complication possibilities.

Nail care tips include not using gels and acrylics excessively so that the nails can regain strength. Long-term use of artificial nails can weaken the actual nails by thinning the plate and making it more prone to breaking, something proved by studies conducted using optical coherence tomography [8]. It is advised that clients take breaks between applications—for instance, after 2-3 weeks of applying gel polish, a week should be given for the restoration of the nails to their original state—this helps in avoiding chronic damage and keeps the nail unit healthy. Proper removal of gel polishes and acrylic nails by professionals helps in reducing mechanical damage leading to onycholysis. Coatings removed improperly by self-scraping or aggressive solvents can lead to microcracks and thinning of the plate. Safe methods, like soaking in special solutions and the use of milling machines operated under controlled pressure, are ways in which professionals carry out the work that also minimizes the risk of injury.

An important part of prevention is monitoring the condition of the nails and contacting a doctor as soon as there is trouble, such as redness, swelling, pain, or discoloration. These symptoms will help pick up infections, allergies, or even systemic diseases that need medical treatment. For instance, constant redness may indicate a need for paronychia, and yellow coloration of the nails may indicate some problem with the respiratory system. Early referral to a dermatologist or podiatrist will facilitate timely disease diagnosis and treatment before it progresses.

These suggestions, based on clinical studies and info, help clients make smart choices and keep their nails healthy, adding to the details on risks and clinical parts shared earlier. Following these tips gives a mix of style choices and worry for physical well-being.

CONCLUSION

Nail beauty, now trending on social media and engaged by fashion, has become a major tool in the pursuit of individual expression and self-care. Gel polish techniques, acrylic long nails, and elaborate designs continue to grow in popularity but come with risks to nail health when used. The client's inappropriate treatment, low-quality products used, and violations of hygiene regulations can lead to infections (onychomycosis, paronychia), allergic reactions, or mechanical damages (onycholysis, plate thinning). This victimization should serve as an eye-opener for bringing clinical knowledge into the domain of beauty to ensure customer safety. An important aspect of risk reduction is the stringent implementation of instrument sterilization procedures as well as training the technicians in basic nail anatomy. Knowledge about nail unit structures, such as matrix and bed, would help avoid accidents during therapies. Working together with skin and foot doctors helps spot health issues early that show up as changes in the nails (like yellowing with breathing problems) and make ways to fix them safely. Research using clear images shows that even "soft" methods, like taking off gel polish, need a pro's care to avoid small cracks.

Clients should actively choose licensed salons to meet hygiene standards and moderate the use of artificial coatings. Regular breaks between the procedures and the professional removal of the materials help reduce the load on the nail plate, keeping its physiological integrity. Keeping an eye on the condition of the nails and referring to specialists in time once symptoms start appearing (redness, pain, peeling) is slowly becoming one of the key elements in preventing complications.

The Industry can be developed through a cross-disciplinary approach that integrates innovations in aesthetics with dermatological achievements. The development of hybrid products, such as gel polishes with low toxic component content, along with non-

invasive diagnostic methods (like optical tomography) would probably minimize risks while maintaining creative potential in nail art. Material long-term effects on nail structure should be investigated further, and educational programs for masters emphasizing the clinical aspects of their work should be created. The integration of Aesthetics and Medicine allows the path toward sustainable development within this industry, where beauty and health elements for nails become mutually complementary.

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