Unforeseen Dangers in Modern Salons: MMA Acrylic

Shana Ramnarain

New York City College of Technology

BUF 101 Introduction to the Fashion Industry

Dr. Denise Sutton

April 26, 2021

Abstract

This paper examines the concealed issue of Methyl Methacrylate (MMA) usage in modern day salons. Introduced to the industry with the development of artificial nails, Methyl Methacrylate has been known to cause consequential health risks. After banning MMA from use in the nail industry, many businesses still seek this harmful chemical for its inexpensiveness. Without routine inspections or general public knowledge of this chemical, businesses continue to harm consumers with this poisonous substance.

Keywords: Methyl Methacrylate, Ethyl Methacrylate, acrylic nails

Unseeming Dangers in Modern Day Salons: MMA Acrylic.

Nail care is just one of the many ways self-adornment and hygiene are appreciated in society. Ability to care for oneself means well-kept attire, as well as nails, but what happens when nail care involves harmful chemicals? Methyl Methacrylate (MMA) is a chemical compound used in the nail industry since the genesis of artificial nails in the 1950's. After the FDA was prompted to investigation after a series of complaints of fingernail abnormality and cases of dermatitis, Methyl Methacrylate was traced to be the origin cause. Now known for it's extremely damaging effects, modern nail care supply companies are sure to highlight the exclusion of MMA from their products, going as far to include the chemical's exclusion on their packaging, labeling acrylic products as *"non-MMA formula"*. MMA was soon banned from use in artificial nails, with EMA, or Ethyl Methacrylate taking it's place at a more expensive price, but with safer conditions. Although the chemical has been outlawed in many states and countries, MMA is still being used in unsuspecting nail salons for the low, under-market cost, and in products unchecked by the government's health department before hitting shelves. EMA, coming at a higher price, is the standard for health in acrylic nails.

Examples of modern day EMA acrylic nails.

Acrylic Nail History: What is MMA?

Artificial nails and nail enhancements have been used in many ancient cultures as a classification of status. Seen as a luxury only afforded by the upper classes and high-ranking elites, materials like henna, kohl or egg whites were used to dye and decorate fingernails in ancient Egypt and China (Forbes 1957). These practices were only maintainable by the upper classes, as the working laborious classes would not be able to afford the maintenance of beauty practices such as well-kept nails. Nail care became a practice reflecting self-image, used to enhance appearance of the hands. This ancient beauty practice is now available to all and has since given way to modern technologies and inventions of new nail materials, such as gel nail polish for manicuring. Nail enhancements have evolved and expanded throughout the years, keeping their position as status markers while new technologies like acrylic nails, were derived from other industries, eventually taking over the nail enhancement industry.

The materials used for acrylic nails were derived from the medical industry, primarily the dental industry in 1957 when dentist Dr. Fred Slack broke a nail and implemented dental acrylic and aluminum foil to aid the break (Lteif 2020). After discovering his new solution for nail breakages, Fred, accompanied by his brother Tom Slack, experimented with many formulas to patent the first successful acrylic system which they named *Patti Nails.* After this discovery, MMA nail liquid, otherwise known as liquid monomer, was being used in nail salons as the regular ingredient in acrylic nail extensions.

The acrylic used by Dr. Slack was the same material used in many other medical practices. MMA was the choice compound for artificial nails for its strong polymerization properties and was also used in orthopedic practices as fillings and bonding agents during bone surgeries (Sauni 2008). In the nail industry, MMA liquid monomer was glorified in its ability to

polymerize with acrylic powder, creating a moldable, clay-like substance which was shaped by a technician onto the nail. MMA was preferred for its ability to solidify and adhere more quickly and stronger than its safety alternative, Ethyl Methacrylate (EMA). Use of MMA was valuable for nail technicians who needed a material that wouldn't deteriorate easily on the fingernails of modern working women. Technicians also valued MMA's ability to harden rapidly, giving technicians the chance to provide a speedy service for clients.

Health Issues pertaining to MMA use.

MMA was used in the nail industry for it's quick setting properties and it's strong ability to withstand day to day activities without breakage for regular clientele. Issues can be seen within the salon when the process of application is magnified. MMA requires a very ridged, textured nail plate for the strong material to adhere. When using MMA, nail technicians need to compensate by over filing the natural nail plate, damaging and creating ridges in customer's natural nail in order for the MMA to adhere. This differs from EMA, which only requires a light buff of the nail plate, sustaining the nail's natural layered strength. This is just the beginning of MMA's harmful effects.

Overfiled nailbeds: MMA prep revealed.

Further problems arise when health issues related to MMA caught the attention of the FDA. Both employees and customers face serious health risks while dealing with MMA. Employees undergoing prolonged exposure to MMA experience increasing amounts of

irritability in the nose, throat, eyes and skin. Prolonged exposure to MMA can lead to more serious issues such as breathing problems, and chronic nausea for employees using this material daily. For customers, the effects are worse. MMA acrylic is normally used in dental labs to make crowns for teeth; the chemical being handled with protective gloves and eyewear, in a laboratory setting away from the patient. This precaution is to eliminate the chance of contact with live skin. For customers of acrylic nails, the MMA liquid monomer is applied directly to the nail bed, leading to allergic reactions that can cause damage and deformity of the fingernail, contact dermatitis, and in some cases entire nailbeds detaching from the finger and falling off in attempt to rid the body of detected harm or infection. Other serious results of MMA have been inability for nails to regrow after MMA damages the nail matrix within the finger (origin of nail growth) (Ma 2019). Milder risks customers may face when using MMA acrylic can be drowsiness, lightheadedness, itching of the nail beds, dizzy spells or trembling hands. All symptoms of poisoning, MMA was banned after many complaints were made to the FDA. With the increasing complaints of adverse health issues stemming from MMA use, the FDA has declared MMA a poisonous and deleterious substance.

Contact dermatitis.

As MMA has come to be known as poisonous and unsafe for use on live skin, EMA was recognized for it's more practical features and implemented in the acrylic system after MMA was banned. Ethyl Methacrylate is the chemical which took MMA's place in acrylic nails,

replacing the chemical in liquid monomer sales. EMA, a close relative to MMA, is a safer chemical approved for use in artificial nails. Needing more time to cure, and being sold at a higher price, EMA allows artificial nails to be applied and removed with ease. EMA has not been known to cause any health effects compared to its sister molecule, MMA, but does come at a much higher price and requires more time during an appointment to set.

Effects on the Industry of Fashion

Use of MMA in servicing salons and nail product companies can affect the nail and beauty industry as a whole. Aside from employees and customers dealing direct and obvious health experience when in contact with MMA, products containing MMA must also be recalled and reformulated. In the nail industry, this applies to liquid monomer, the liquid component of an acrylic system. Other products that contain MMA would be bonders like nail glue, or certain nail lacquers. The nail suppliers who distribute products containing the harmful chemical face the risk of lawsuits detrimental to the financial health of the company, and its overall stance in the beauty market.

In the early 1970's, the FDA received numerous complaints of damage and deformity related to nail extensions made with MMA acrylic. The FDA has since removed MMA from the available market and attempted to remove all MMA containing products by means of various court proceedings, banning its use in products and salons (FDA 2020). Manufacturers of MMA based products are affected by this ban, as well as salons and working nail technicians. Although MMA was banned by the FDA in the 1970's, no formal FDA regulation was implemented for all states in the United States, as the chemical is only banned in 30 states, nor were further regulations put in place to check for evidence of this chemical in salon settings.

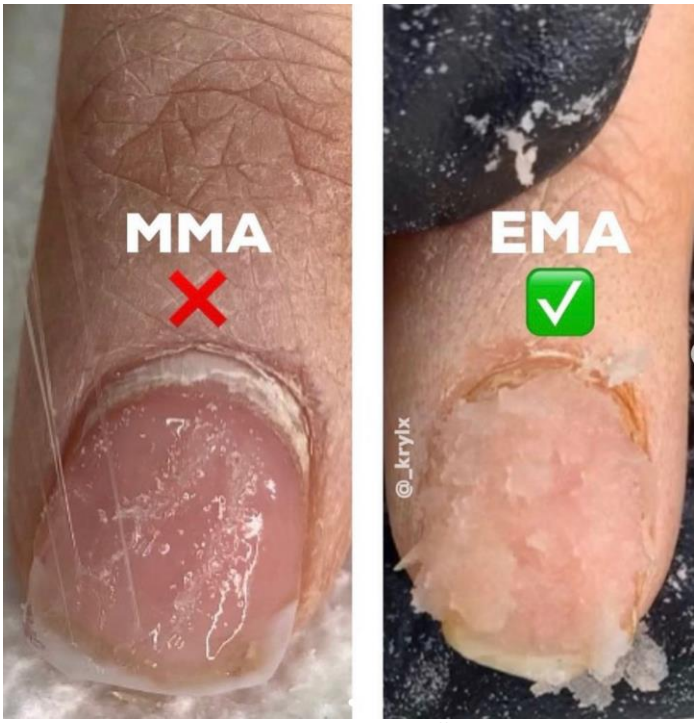
Many salons still use MMA acrylic in their services and purchase products containing MMA for the lower cost. This business practice will turn away many potential clients until the business changes this aspect of its operations. Salons, only requiring inspection every 5-6 years in New York, continue operations unregulated for MMA usage in their acrylic nail services. Because of MMA's cheap cost and quick setting properties, many salons still opt to use MMA acrylic on their customers as there is no annual inspection to deter the usage of this chemical. This allows for cheap, quick nail services, at the cost of the client's health. Since reports of this misuse is entirely dependent on complaints logged against the salon for their acrylic sets, combined with a general lack of knowledge from consumers about the effects of MMA, most salons go unnoticed in this dangerous practice. Businesses producing nail products containing MMA face the risk of lawsuits as seen after 1970, many firms voluntarily recalled items containing MMA to avoid legal discrepancies. Although action was taken in the 1970's, without regulation many manufacturers continue to sell products containing MMA to salons at a cheap price.

Standing against MMA

Although action was taken in the 1970's, MMA is only banned in 30 states. There are no modern or continuous regulations or inspections in salons or companies selling nail products to screen for MMA use. These mistakes are what allow MMA poisoning to continue to affect consumers, and workers without their knowledge. The harmful affects of MMA acrylic are concealed to the public by nail salons using this material. Customer inquiries about MMA usage usually result in refusal of service, in attempt to silence and avoid customers who may report the business. Not many consumers are aware of the effects of this chemical still being illegally used

in salons, so not many reports are submitted, making it extremely hard to trace an infection back to the origin salon using MMA.

To combat the use of MMA, consumers can become informed of the signs that MMA acrylic has been used during a service. The most common tell for MMA acrylic is found during removal. Normally, customers will soak their nails in acetone. This is a substance used to dissolve nail enhancements, leaving a clean natural nail afterward. With EMA acrylic, this is done seamlessly with easy removal. With MMA acrylic, the result is a gooey like texture that rehardens quickly after attempts to remove the enhancement. The MMA is extremely strong, so removal is almost impossible. Removal of MMA acrylic can be dangerous to the nail technician, damaging to the equipment used and to the client. Once customers identify the salon using MMA, reports of health violation can be made to the Occupational Safety and Health Administration (OSHA) to shut down business until fines are paid and ethical practices are upheld.



MMA vs EMA soak off

Other alternatives to stop the misuse of illegal chemicals in service-based beauty businesses is the implication of health grades in salons. In 2010, restaurants in New York City were required by law to meet certain circumstances in order to have an appealing health grade. This was implemented to prevent foodborne illnesses in restaurants. Within the first year of this requirement, with continuous routine inspections done on restaurant businesses, 30% of restaurants who scored a “C” or lower have improved their grades to “A” or “B” status (Wong 2015).

I firmly believe nail, hair and beauty salons should be subject to the same treatment. Border lining medical care of human beings, clientele being treated almost like patients, salons of all types should be subject to routine inspection to rid the industry of laziness, greed and careless beauty business practices. With the application of regular inspection screening for unsafe chemicals capable of infection or illness, many salons will be forced to increase their concern around health and safety procedures within their businesses, keeping MMA away from consumers of the nail industry and ensuring safe work conditions for nail specialist across the country.

References

FDA Center for Food Safety and Applied Nutrition, U. S. F. and D. A. (2020, August 8). *Nail Care Products*. U.S. Food and Drug Administration. https://www.fda.gov/cosmetics/cosmetic-products/nail-care-products#reg.

Forbes, R. J. (1957). *Studies in ancient technology* (Vol. 1). Brill Archive.

Lteif, M., El Hayek, M. S., Azouri, H., & Antonios, D. (2020). Knowledge and Attitude Among Lebanese Women Toward Hazardous Chemicals Used in Nail Cosmetics. *Journal of community health*, 1-10.

Ma, G. X., Wei, Z., Husni, R., Do, P., Zhou, K., Rhee, J., ... & Yeh, M. C. (2019). Characterizing occupational health risks and chemical exposures among Asian nail salon workers on the East Coast of the United States. *Journal of community health*, *44*(6), 1168-1179.

Sauni, R., Kauppi, P., Alanko, K., Henriks-Eckerman, M. L., Tuppurainen, M., & Hannu, T. (2008). Occupational asthma caused by sculptured nails containing methacrylates. *American journal of industrial medicine*, *51*(12), 968-974.

Wong, M. R., McKelvey, W., Ito, K., Schiff, C., Jacobson, J. B., & Kass, D. (2015). Impact of a letter-grade program on restaurant sanitary conditions and diner behavior in New York City. *American journal of public health*, *105*(3), e81-e87.