How is Cosmetic Regulation a Root Cause of Occupational Illnesses and Injuries among Discount Nail Salon Workers?

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Rene Nah

Supervisor – Tommy Wu

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**Introduction**

The number of Canadian discount nail salons has been rapidly increasing due to their popularity. Characterized by fast service and walk-in availability, women and young girls can easily access low-cost manicures, pedicures, and acrylic nails. According to Velez et al. (2016), “cosmetology, a profession disproportionately held by women, routinely exposes workers to a wide range of environmental chemicals through inhalation or skin absorption, which can lead to a number of adverse health effects.” (263), nail salon workers[[1]](#footnote-1) also being one of them. Studies on workplace exposures to hazardous chemicals in nail care products have reported adverse effects on respiratory and reproductive health. 80% of the nail industry is represented by women and 80% are immigrants, half being of Vietnamese descent (Dang et al., 2021). Similarly in Toronto, the nail salon industry is predominantly made up of Asian immigrant women, with little diversity (Sanaat et al., 2021). With discount nail salons being dominated by women and Asian immigrants or refugees, these workers disproportionately experience adverse health outcomes.

It is not by chance that nail salon workers are overrepresented by Asian immigrants and women, nor are the patterns of occupational chemical exposure. Precarious work, immigrant or refugee status, ethnicity, and gender are root causes of occupational injuries and illnesses. These factors also contribute to their invisibility. I define invisibility as the lack of agency and control these workers have over their working conditions. In addition, these workers are overlooked by policy measures that fail to protect them from occupational chemical exposures. The lack of government regulations in place to protect these workers from occupational injuries continues to lead them to long-term health problems. The focus of public health is to protect the public from biological hazards and chemical exposure commonly found in cosmetic products and personal service settings. Tools to regulate hazardous chemicals in cosmetics are managed at the federal level, while compliance guidelines are set out provincially. However, research done on Canadian policy measures related to personal service settings and nail salons is sparse.

In this research paper, I will investigate how current Canadian cosmetic legislation is a root cause of occupational injuries and illnesses among nail salon workers. It is important to note that the causes of these occupational injuries come from a combination of social factors, but much has been researched on such factors contributing to poor health and precarious work. My research paper will analyze current cosmetic regulations and various root causes of occupational injuries and illnesses that ultimately result in the adverse health outcomes of nail salon workers, beginning with a brief methodology section. First, I will discuss the adverse health effects chemicals have on worker health. Next, I will review why nail salon workers are being injured. Consideration of gender and occupational health and safety research surrounding women-

dominated occupations will be highlighted. Following that, I will explore the connection between adverse health outcomes and precarious work. In addition, the experience of immigrant and refugee women in precarious work will be connected to why the discount nail salon industry has become an employment pipeline for these marginalized workers. Finally, I will look at the connection between government legislation and the adverse health outcomes for workers. Analyzing how each level of government is responsible for permitting hazardous chemicals into workplaces will reveal that policy is a source of occupational injuries and illnesses. A discussion on why legislation is a root cause of occupational injuries and illnesses will conclude this paper.

**Methodology**

Literature was collected from academic journal articles, news articles, government websites, and community groups. Research articles on the types of chemicals in nail salons and on personal care products, levels of chemical exposure in nail salons and the environment, occupational injuries coming from biological and chemical hazards, and how gender shapes occupational health and safety research were collected. Recent news articles were used to showcase discourse surrounding discount nail salons. Moreover, discourse is an important factor to show how media perpetuates the invisibility of marginalized workers. Finally, data from the Government of Canada, Ontario Public Health, and organization documents were analyzed to uncover what regulations exist for workplaces, chemical exposure levels, and worker safety in nail salon settings.

**Literature Review**

The patterns of chemical exposure and adverse health outcomes of nail salon workers stem from factors of social location. Factors shaping social location are occupation, gender, citizenship status, and age. Many studies have explored the adverse chemical effects nail salon products have on women’s health, yet little research has been done looking at how cosmetic regulation is a cause of occupational injuries. I will investigate existing literature on how social factors contribute to weak policy measures and are the root causes of occupational injuries. Exploring how occupational health and safety are researched will reveal that women-dominated occupations are overlooked in terms of occupational health and safety. The role of gender contributes to the health outcomes of working women due to their domestic roles beyond the workplace. Moreover, reviewing the health outcomes of precarious workers will reveal that marginalized women experience physical and mental strain, exasperating existing occupational injuries. To draw the connection between regulation and injuries, we must analyze how harmful chemicals are permitted in cosmetic products.

In this section, I will identify the adverse health effects common chemicals, like phthalates, have on women’s health. Analyzing where women are exposed to phthalates in their environment and how social factors shape exposure frequencies may reveal how marginalized workers are at a higher risk of adverse health outcomes. Then I will explore how occupational injuries may be exasperated due to reasons beyond workplace exposure. Finally, I will explore Canadian cosmetic regulation at all three levels of government: federal, provincial, and municipal. This paper will focus on the province of Ontario, as it has the largest number of hair and nail businesses in the country (IBISWorld, 2021). Moreover, municipalities of the Greater Toronto Area (GTA) will be focused on due to the previous research done on Toronto nail salons.

*Who is working in the nail salon industry?*

Historically, Asian women have been depicted as passive, nimble, and efficient workers (Gupta, 1993). This stereotype has pipelined them into production line jobs due to their “natural” dextrous abilities while being a “[] cheap and efficient source of labour for western capitalists” (28). Gupta’s analysis of the role ethnicity has on paid labour is seen in current labour market trends. East Asian women dominate the North American nail salon industry, and these workers are at a higher risk of occupational injuries caused by small, fast, and repetitive movements compared to the general working population (Grešner et al., 2017). Adverse health outcomes come from chemical exposures in the workplace while existing injuries stem from domestic and financial responsibilities marginalized women carry.

The nail salon industry is made up of young, immigrant or refugee, Asian women. Sanaat et al.’s (2021) study represented over 200 nail salons in Toronto and results showed that over half of the workers were aged between 20 to 40 years old, while 44% were between 20 to 30 years old. These women are of childbearing age and more vulnerable to reproductive health problems. Additionally, the majority of this precarious industry are immigrant or refugee women. immigrant women are often found in precarious work due to social determinants like – citizenship status, education, domestic and family responsibilities, and limited English ability (Ford, 2020 and Premji et al., 2014). Kang (2010), Quach et al. 2013, White et al. (2015), Seo (2019), and Dang (2021) all note that entering the nail salon industry is attractive to new immigrants due to the low barriers to entry: minimal English proficiency, no prior experience is required, training can occur on the job, and employers often hire family and friends. Systemic discrimination also channels these women into precarious work. Professional deskilling and Canadian education or experience requirements prevent new immigrants to find equivalent Canadian careers (Premji et al., 2014). These factors contribute to pipelining a disproportionate number of new Asian immigrants to work in this industry.

*What adverse health outcomes are they experiencing?*

Having established that nail salon workers are marginalized women, this subset of workers disproportionately experience injuries and illnesses coming from hazardous chemical exposure (Quach et al. 2013 and Grešner et al., 2017). Creating beautiful manicures and pedicures is achieved through various volatile organic compounds (VOCs), phthalates, and organophosphate plasticizers (OPEs) used in nail care products. VOCS are a group of toxic and hazardous chemicals that create dangerous workplace environments – due to their gas form – as toxins are absorbed through the skin or inhaled through the mouth or nose. Phthalates are a type of VOC used as plasticizers in nail care products. Plasticizers soften plastic and increase its flexibility (Government of Canada, n.d.). Low-dose but long exposures to these chemicals pose a threat to the health and safety of nail salon workers. Exposure to some phthalates and OPEs are linked to being endocrine disruptors that directly affect reproductive hormones and increase risks to reproductive health and fetal health (Scott & Lewis 2016). Other adverse health outcomes are respiratory damage and increased risks of cancer. Physical injuries have been linked to the poor ergonomics of this occupation. This section will outline the occupational injuries and illnesses linked to common chemicals found in nail care products.

Studies done by Ma et al. (2019), Nguyen et al. (2022), and Craig et al. (2019), collected air concentration samples of plasticizers via passive samplers – wristbands and brooches – worn by nail salon workers on shift. Additionally, the study by Craig et al. (2019) used pre-work and post-work urine samples of workers. Results revealed that concentrations of VOCs were higher in post-work samples, proving that workers are exposed to chemicals and workers absorbed chemicals during their shifts (Craig et al, 2019). Within an eight-hour shift up to 19 phthalates and OPEs were traced, but levels of VOCs, OPEs, and phthalates vary depending on the method of sampling and vary amongst salons (Nguyen et al., 2022). Little research has been done on the interactions of various phthalates and OPEs, and the adverse effects it has once workers are exposed to chemical combinations.

*Phthalate Exposure*

The overrepresentation of Asian immigrant women in the occupation has led to immigrant women being disproportionately exposed to phthalates compared to non-immigrant males (Ford & Scott, 2017; Seo et al., 2019; Sanaat et al., 2021 and Nguyen et al., 2022). Some phthalates are known endocrine disruptors commonly used in North American cosmetics and are unmonitored in discount nail salons (Velez et al., 2016). Nail salon workers are routinely exposed to phthalates due to the common use of these chemicals in nail care products. Although phthalates naturally exist within the environment, long-term and low-dose exposure have shown to have adverse health effects on women, pregnant women, and developing fetuses (Scott & Lewis, 2016).

Moreover, other social factors beyond the workplace expose women to phthalates more frequently than men like traditional domestic responsibilities, personal cosmetic use, age, and sex (Velez et al. 2016). First, traditional domestic responsibilities like household cleaning expose women to chemicals more frequently than men, since women continue to take on domestic roles within the household (Messing et al., 2003 and Velez et al., 2016). Second, common cosmetic products that are applied directly to the skin contain phthalates. Both household cleaning products and personal cosmetics products are marketed toward women and used by women, increasing the frequency of exposure (Scott & Lewis 2016). Women with lower socioeconomic status are more likely to use cheaper cosmetics containing higher levels of phthalates (Velez et al., 2016). Third, chemicals affect human health during different times of development and differ based on age and sex. Phillips (2016) describes puberty, pregnancy, and menopause as “critical windows of vulnerability”, where exposure to chemicals can cause irreversible harm to health. Adverse health can happen on the developing brain during puberty, the health of the fetus during pregnancy, and the central nervous system of adult women (Phillips, 2016).

*Other workplace exposures*

Ford (2015) states “Endocrine-disrupting chemicals (EDCs), by interfering with normal processes, can have developmental, carcinogenic, mutagenic, immunotoxicological, and neurotoxical effects” (7) and evidence of infertility and miscarriages have been found amongst nail salon workers (Grešner et al, 2017 and White et al., 2015). EDCs found in nail salon products can directly affect hormones once exposed and cause damage to the reproductive system (Messing, 2021). Nail salon workers have reported themselves or other coworkers experiencing miscarriages, and miscarriage rates among these workers are higher than rates among other Asian women (Ma et al., 2019). Small gestational age and other adverse effects on fetal health have been linked to nail salon workers due to due to higher levels of phthalates found in their bodies (Quach et al., 2014). Unfortunately, Ford and Scott (2017) state “preventing future harm to a child would require parents to begin mediating their exposure before conception” (57), alluding to the link between nail salon work and poor fetal health. Pregnant nail salon workers have not been heavily researched, but children born to women exposed to VOCs tested poorly on auditory memory, general verbal information, and attention (Ford & Scott, 2017). These studies reveal that occupational chemical hazards put nail salon workers at higher risk of reproductive health damage than other working women.

Coughing, wheezing, skin irritation and headaches are symptoms of respiratory damage (Grešner et al., 2017 & Ma et al., 2019). Long-term respiratory illnesses like asthma and rhinitis stem from direct contact with chemicals and poor ventilation (White et al., 2015). Inhaling dust particles from filing acrylic nails can result in inflammation of the inside of the nose, increased coughing, and increased phlegm production (PQWCHC n.d.). Mitigating respiratory illnesses would require removing chemicals from nail care products. Short-term solutions to VOC exposure include switching to safer products and adapting practices like closing all nail products when not in use. General shop ventilation is required for all nail salons, but local sources of ventilation are most effective in collecting fumes and dust (PQWCHC, n.d.). Ma et al. (2019) reported that 96% of participating salons use ventilation but did not provide detail on the type of ventilation. White et al’s (2015) study reported that 49% of salons used a general ventilation system. Costs of installing local or general ventilation may be a deterrent for owners but other alternatives should be considered. A study by Lamplugh et al. (2020) tested the efficacy of VOC absorption with low-cost absorbents, and low-cost ventilators, as an alternative method to costly ventilation installment. Activated carbon had the highest absorption rate with and without the use of a synthetic jet actuator (SJA) (Lamplugh et al., 2020). The SJA was used to create an airflow directed at the absorbent. Activated carbon significantly decreased VOC levels throughout a 22-hour test period and can mitigate VOC emissions when coupled with active airflow within indoor spaces (Lamplugh et al., 2020). Effective ventilation quickly removing VOCs is key to keeping indoor air quality clean, especially in nail salons.

Physical injuries like musculoskeletal (MSKs) injuries and repetitive strain injuries (RSI) are inherent due to the poor ergonomics of nail salon work. Workers commonly work eight hours a day doing small, repetitive motions with no breaks or designated break times (Sanaat et al., 2021). Thus, greater opportunities for work-related injuries and strain to the upper extremities (like shoulders and arms) exist. Neck, back, wrist, and hand strain are most reported amongst nail salon workers due to “[…] sitting for prolonged periods, bending, and holding awkward postures, as well as repetitive and fine hand, wrist and arm motions” (Sanaat et al., 2021, 226). Awkward positions combined with static positions can result in severe physical injury. Workers are encouraged to work quickly to reduce customer wait times while engaging in conversation with customers during the service (Ford, 2020). Demands to work faster and increase service output hinders the ability of nail salon workers to take appropriate breaks to stretch and get fresh air. Ford (2014) recommends employers impose mandatory breaks during shifts to reduce prolonged exposure to chemicals in the workplace and to give strained muscles rest.

This section illustrated the occupational injuries associated with nail salon work. Yet root causes of adverse health outcomes stem from social factors like occupation and citizenship status. Immigrant women are often found in precarious work due to social determinants like – citizenship status, education, domestic and family responsibilities, and limited English ability (Ford, 2020 and Premji et al., 2014). Features of precarious work include low pay, part-time or shift work, low job security and dangerous working conditions (Premji et al., 2014 and Ng et al., 2016). Many immigrants and refugee women are found in nail salon work due to the low barriers of entry. Precarious work and family responsibilities have been linked to poorer physical and mental health outcomes (Ng et al. 2016 and Cranford et al., 2003). The disposability of this subset of workers is perpetuated by social barriers stunting their ability to find better work. Research on marginalized women and precarious work is limited and dated, but social determinants and experiences are consistent among the findings. We see that nail salon workers are experiencing adverse health outcomes for reasons beyond workplace exposure.

Ford (2020) and Ng et al. (2016) analyze how social reproduction, unrecognized education credentials, citizenship status, and discrimination contribute to immigrant and refugee women being pushed into a cycle of precarious work. This cycle has been referred to as “precarity capture” (Ng et al., 2016). Social reproduction refers to unpaid caregiving, household, and domestic responsibilities, that women traditionally take on and amplifies the impact of precarious work (Ford, 2020 and Vosko et al., 2009). These domestic and household responsibilities have been referred to as the “double shift” or “double workday” and push women into low-wage part-time work (Cranford et al. 2003 and Premji et al. 2014). Due to the “double workday”, women may be at a higher risk of strain injuries or experience slower recovery from physical injuries (Biswas et al., 2022 and Messing, 2003). Toronto women felt an additional layer of mental and physical stress from social reproduction as they contribute long hours to wage work and contribute long hours to unpaid domestic work (Ng et al., 2016). Mental stress coming from financial pressure has been common in interviews with immigrant and refugee women (Premji et al., 2014 and Ng et al., 2016).

Earning low wages creates economic insecurity and is heightened for women who have children as their financial position is unstable (Ng et al., 2016). Low earnings combined with employment status creates a precarious employment situation for nail salon workers. Research has shown that nail salon workers make low wages and are vulnerable to financial exploitation from salon owners. According to Indeed (n.d.), nail salon technicians in Toronto make an average of $19.20 per hour, and an average of $47 919 per year. This average wage between salons may vary as some nail salon workers are paid per service, and some are paid by the hour. Indeed did not provide a detailed breakdown of the hourly or yearly salary, making it difficult to factor in the tips that salon workers may earn. These results were limited to 56 respondents but were the highest number of respondents among other cities including Mississauga, Scarborough, Burlington, Hamilton, and Oakville. Additionally, the demographics of respondents were not captured. Citizenship status may shape how some workers are compensated, since undocumented workers may be earning unreported cash payments. Capturing an accurate picture of average compensation is unclear, but low wages can be concluded. Income is closely related to health outcomes since the ability to afford shelter, food, and childcare contributes to stress-related health problems (Velez et al., 2016). Moreover, how owners categorize and hire nail salon workers can shape the legal protections these workers are entitled to.

In Ontario over 9000 personal care establishments[[2]](#footnote-2) are considered “non-employers” since they do not have employees (Government of Canada, n.d.). However, this group may employ independent contractors, which legally differ from employees. Mojtehedzadeh (2018) and Lee (2021) report that many Toronto nail technicians are hired as independent contractors. In Ontario, the Employment Standards Act (ESA) does not apply to independent contractors, which excludes them from minimum wage, employment insurance, and T4s (Ontario, n.d.). Unfortunately, some workers are unknowingly classified as independent contractors instead of employees which presents greater problems as these workers may not be aware of their workplace rights (Mojtehedzadeh, 2018). WSIB coverage for independent contractors are limited to those that pay premiums for coverage. But due to low earnings many nail salon workers may not opt into paying premiums, thus excluding them from financial support. Being excluded from the ESA heightens precarious situations for employees as they cannot access government-supported benefits during times of unemployment, thus exasperating their precarity.

Research factoring in the social location of racialized, immigrant women in precarious work is limited, but a clear connection to poor health outcomes can be seen. Gender, ethnicity, and citizenship status shape the occupations that these women are streamed into. Physical and mental strain stemming from being a marginalized worker are exaggerated by occupational characteristics. Immigrant or refugee women face challenges in finding stable employment and are caught in a cycle of precarious labour.

*Occupational health and safety research*

In addition to how gender and citizenship status contribute to occupational injuries, occupational health and safety research must be considered. Messing et al. (2003) note, “The mission of occupational health research is to prevent disease and suffering among workers.” (625), yet research that considers how gender and sex differences affect occupational illness and injury outcomes is limited. Gender contributes to how occupational health and safety research is shaped. Much of occupational health and safety research has surrounded male-dominated occupations and the health outcomes of male workers (Ford & Scott, 2017 and Biswas et al., 2021). The imbalance of research surrounding male-dominated occupations has emphasized the dangers inherent in occupations like manufacturing, mining, and forestry (Messing et al., 2003 and Biswas et al., 2021). While leaving occupations that are dominated by women under-researched and assumed to be less dangerous. This section will explore different classifications of work and their relation to gender. The injuries experienced by nail salon workers are typical injuries arising from women-dominated occupations.

For example, research on phthalates and their adverse effects on the reproductive system has been focused on the adverse effects on men’s health, reinforcing that research on chemical exposure has been skewed to address the health outcomes of men (Velez et al. 2016). Women are more likely to experience phthalate exposure in the nail salon industry, which poses a large threat to their reproductive health. Such exposure can adversely affect the long-term health of women and their children. The mental health of women can be negatively impacted by the adverse effects of chemical exposure. Problems like infertility and endometriosis may cause unfortunate social and psychological consequences for women (Velez et al., 2016). Occupational injuries like stress and psychological strain are common in women’s occupations and are less visible than physical injuries more commonly seen in men’s occupations. Health outcomes of women are overlooked due to their less visible injuries and occupational exposures.

Messing (2021) explores work and occupational health and safety through a gendered lens while challenging assumptions that women’s work is safer or not as dangerous as men’s work. Biswas et al. (2021) scoping review of gender and occupation found that women are exposed to less visible and less recognized occupational hazards. Research done by Vezina et al. (1992), Messing et al. (1998), Biswas et al. (2021), and Biswas et al. (2022) note the common misconception that women-dominated jobs are safer due to their higher representation in “light work” jobs, that are not commonly perceived as hazardous occupations. Occupations that have been classified as “light work” or “heavy work” has segregated workers based on gender. Occupations classified as “heavy work” are perceived as more dangerous due to their more visible occupational hazards (Vezina et al., 1992 and Messing et al., 1998). Further, the majority of men are found working in “heavy work” industries such as manufacturing or forestry while a majority of women are employed in the service sector (Messing, 2003). The characteristics of “light work” and “heavy work” differ in occupational tasks but both result in occupational injuries and injured workers.

Characteristics of heavy work include more physically demanding tasks, lifting heavy objects, dynamic movements, and less repetitive tasks (Vezina et al., 1992 and Messing et al., 1998). Occupations associated with heavy work tend to be dominated by men and occupational health research has heavily focused on the occupational dangers associated with heavy work. Common occupational hazards men are exposed to include more physical hazards like heavy lifting, and higher exposures to radiation and ultraviolet rays (Biswas et al. 2021). Due to the apparent hazards in primary and secondary industries, plenty of occupational health research has been done to address the associated adverse health outcomes. But research does not address the adverse health outcomes and experiences of women in these occupations. Occupational injuries experienced by women in male-dominated jobs differ from the expected injuries men typically incur. This supports the assumption that “heavy work” or male-dominated occupations are more dangerous than “light work” or female-dominated occupations, thus the focus remains on male health outcomes.

Generally, “light work” tasks are assigned to women due to their assumed natural capability to be more dexterous than men (Gupta, 1993). A common characteristic of “light work” includes repetitive movements involving little force. Two studies of hospital workers and garment workers analyzed the “light work” performed by workers (Messing et al., 1998 and Vezina et al., 1992). Results revealed that “light work” tasks resulted in more musculoskeletal (MSK) injuries in upper extremities, and back pain, caused by reaching movements and holding static positions (Messing, 1998). More recently, studies show that women are more likely to develop chronic MSK injuries or stress-related illnesses (Messing, 2003). And finally, Biswas et al. (2022) reveal that women are at higher exposure to repetitive work and MSKs than men. Job strain exists in “light work” occupations disproportionately held by women. Vezina et al (1992) state “[] "light work" requires an enormous amount of exertion in a constrained position. It is possible that other typical women's jobs classed as light work also require this kind of effort.” (275). Meaning that “light work” occupations require similar force exertion as “heavy work” since workers are putting in high amounts of physical effort.

Building upon the assumptions that women’s work is less dangerous than men’s “heavy work”, the dangers in settings like nail salons remain invisible and are overlooked. Biswas et al’s (2022) study revealed that women are at risk of physical injury and are at a higher risk of occupational chemical exposures. Occupational illnesses like skin irritation and gastrointestinal sensitivity occur, relating to common symptoms nail salon workers experience from chemical exposure (White et al., 2015). Health and safety regulations are understudied in women’s occupations thus women in those occupations are more vulnerable than their male counterparts (Ford, 2015). The lack of regulation in women-dominated occupations contributes to this population being overlooked in research and policy creation.

Moreover, research methods and tools focus on occupations that are dominated by men and overlook the long-term implications women may experience from the same chemical exposure (Scott & Lewis, 2016 and Biswas et al., 2021). According to Scott & Lewis (2016) health studies that focus on diseases more prevalent amongst women use male rats as test subjects. Studies have neglected to use female-test subjects in animal studies thus the lack of research on women’s health has resulted in women bearing unexpected occupational injuries due to the lack of gender-specific research (Messing, 2021). Biological differences in metabolizing chemicals and different hormonal responses to chemical exposure result in different health outcomes amongst men and women (Messing, 2003 and Scott & Lewis, 2016). Shaping occupational health policies and programs that consider occupations that are dominated by women and have common yet less visible occupational hazards will ultimately lead to better-suited prevention programs (Messing et al., 2003 and Biswas et al. 2022).

Understanding why occupational injuries and illnesses are occurring in nail salons can be traced back to how research is framed around women’s occupational health and safety. Women-dominated occupations are overlooked by policy measures due to assumptions that they are “less dangerous” and the dangers in these occupations are less visible. Nail salon workers and women are inherently more exposed to toxic phthalates in their environment than men, yet their use of them in cosmetic products is legal. Protecting the health of marginalized workers and women, depends on developing better prevention policies that consider biological differences to chemical exposure is needed. Without addressing the negative impacts chemical exposure has on human health, the health of marginalized women will continue to be compromised in the workplace. Chemical exposure is invisible, as well as small, fast, and repetitive movements incur injuries over time. Due to this, we can see that chemicals being used in cosmetics may not pose a large visible danger, but on a micro-scale, nail salon workers are disproportionately experiencing adverse health problems.

*Canadian cosmetic regulation*

This section will explore the current Canadian cosmetic regulation, beginning with a brief history of how women have borne the responsibility of cosmetic risk. A pattern of loose regulation has resulted in a normalization of chemicals in cosmetics. According to Tassero (2020) women have regulated their cosmetic risks since the mid-1900s. Government policy legally allowed the use of estrogen in facial creams, despite its harmful effects on the female reproductive system (Tassero, 2020). Cosmetic products are targeted toward women, thus exposure to toxins from cosmetics is more likely. Women have been responsible to protect themselves from chemical exposure. The federal government has banned the use of estrogen in cosmetics but continues to allow other harmful chemicals into cosmetics that adversely affect women’s health.

At the federal level, “Health Canada defines and communicates requirements concerning the manufacturing, labelling, distribution and sale of cosmetic products in Canada.” (Health Canada, 2006). Additionally, the labelling and testing of internationally manufactured cosmetics standards are set out by Health Canada. At the provincial level, Public Health Ontario uses its Guide on Infection Prevention and Control (IPAC) in Personal Service Settings (PSS) as a tool to inform PSS owners and workers of the expected public health standards. PSS are businesses that offer one or more of these services: manicures and pedicures, hairstyling or barbering, tattooing, body piercings, aesthetics, electrolysis, and injectable personal services. At the municipal level, municipal regions are responsible for licensing and inspecting PSS for IPAC and occupational standard compliance.

At the federal level cosmetic regulation falls under the jurisdiction of the Food and Drug Act, which defines cosmetics as:

"Any substance or mixture of substances, manufactured, sold or represented for use in cleansing, improving or altering the complexion, skin, hair or teeth and includes deodorants and perfumes." (Government of Canada, 2021)

Jurisdiction at the federal level is limited to controlling chemicals entering the country and levels of chemical content allowed in consumer products. These levels are set out by the Canadian Environmental Protection Act, 1999 (EPA) which specifically limits the content levels of VOC and manages toxic chemical risk in consumer products (EPA, n.d. and Scott & Lewis, 2016). According to EPA the legal VOC content for nail polish remover is 85%, being on the higher end of the range – 3% to 90% (EPA, n.d.). The focus will be placed on VOCs as they are commonly found in nail care products and PSS (Grešner et al., 2017; Ma et al., 2019 and Nguyen et al., 2022).

Significant changes to cosmetic regulation began in the early 2000s. The creation of the Cosmetic Ingredient Hotlist (Hotlist) and changes to cosmetic labelling aimed to align Canadian cosmetic regulation to the standards of the European Union (EU) (Lambros 2005). The Hotlist was created as a tool to inform the public of prohibited or restricted chemicals in cosmetic products. Following the creation of the Hotlist over five hundred ingredients were added due to their adverse effects on human health, creating a surplus of controlled ingredients (Gaffken, 2005). The European Chemical Agency (ECHA) uses a similar tool but offers a more comprehensive list of chemicals and organizes prohibited or restricted chemicals based on characteristics – one being endocrine disrupters which are particularly harmful to reproductive health (ECHA, n.d.). A particular chemical of concern is a VOC called dibutyl phthalate. The EU has prohibited the use of dibutyl phthalate in cosmetic and children’s products (Linor & Gordon, 2014). Canada has not banned the use the dibutyl phthalate in cosmetic products but has restricted its use in children’s products to 0.01% in 2009 (Sharma et al. 2014 and Nguyen et al. 2022). This chemical is a known toxin to reproductive health, yet nail care manufacturers continue to use it in their products.

In 2004 Health Canada proposed and implemented mandatory labelling of the exterior and interior of cosmetic products (Geffken, 2004). Changes to labelling included shifting labelling language to International Nomenclature Cosmetic Ingredient (INCI) names, which were already implemented by the EU, Japan, and the United States (Health Canada, 2006). A driving force for this change was to ensure that consumers[[3]](#footnote-3) can make informed choices about cosmetic products and mitigate health risks (Health Canada, 2006). Mandatory labelling allowed consumers to access ingredient lists, yet it is framed around consumers educating themselves on chemicals present in their cosmetics. The onus and responsibility of managing chemical exposure are on consumers instead of Health Canada banning known harmful chemicals from entering cosmetic products. This change pushed consumers to bear the responsibility to reduce their chemical exposure. Cosmetic regulation has enforced labelling but continues to permit toxic chemicals into products.

At the provincial level, all PSS must follow Ontario Regulation 136/18 Personal Service Settings and Public Health Ontario’s IPAC guide. IPAC addresses seven key issues found in PSS: Chain of transmission, routine practices, managing the environment, reprocessing of equipment and instruments, client safety, worker health and safety, and record keeping. Standards surrounding biological and chemical hazards, environmental controls, and personal protective equipment are established but are not specific to nail salons. Only three of the 61 pages in the guide address worker health and safety, reinforcing the focus on public safety over worker safety.

IPAC addresses the biological risks and hazards associated with manicures and pedicures. To mitigate the risk of transmitting or spreading viral, fungal, or bacterial infections strict guidelines around sterilization and single-use equipment must be followed. This is framed around protecting customers from infections carried by unsanitary tools. Unfortunately, the risks of chemical exposure and its adverse effects from nail care products are not available in the guide. Instead, information on chemical exposure is related to chemicals in cleaning and sanitation supplies. Section 2.1 Risk Assessment, IPAC lists “exposure to chemicals used in the cleaning and disinfection of equipment and environmental surfaces.” (9) as a contributing risk factor to worker health. This implies that chemical exposure is rooted in cleaning supplies and not cosmetic products.

Environmental controls and personal protective equipment (PPE) focus on mitigating infection risks to clients from workers (IPAC 2019). PPE such as single-use gloves is required to reduce bacterial, fungal, or viral infections between tools, workers, and clients (IPAC 2019). But PPE to protect workers from chemical hazards coming from nail care products was not discussed. Engineering controls like local ventilation and physical barriers are required in nail salons to reduce nail dust and fumes from entering the air. No specific requirements of ventilation regarding ventilation minimums to the square footage of PSS are outlined.

Finally, at the municipal level, each business must comply with local municipal guidelines. The GTA is made up of five municipalities: the City of Toronto, York Region, Halton Region, Region of Peel, and Region of Durham. All municipalities have inspection reporting and disclosure programs aligned with IPAC and Ontario Regulation 136/18 Personal Service Settings. These programs are relatively new, with the City of Toronto’s BodySafe program being the oldest, established in 2013 (OPHA 2013). The basis of municipal reporting systems requires establishments to present a “pass” sign visible to customers. The three outcomes of a PSS inspection are “pass”, “conditional pass”, or “closed”, based on satisfactory compliance with health and safety standards. Inspections of PSS are sparsely done once a year, and additional inspections are completed on a complaint basis (City of Toronto, 2022). Inspection results are disclosed online, and these inspection programs encourage customers to search their intended PSS before their visit.

Infractions are publicly posted on municipal websites offering consumers information on infractions and the ability to make more informed choices. These tools aim to protect the public from any biological infections that can be contracted in PSS like Hepatitis B, Hepatitis C, HIV and skin and nail fungus (York Region n.d.). Common steps customers are encouraged to take are to ask questions regarding the sanitation of tools during visits, look for the inspection “pass” sign, and report concerns to public health (York Region n.d. and City of Toronto 2022). Regulation of spas at the municipal level appears to be a joint effort with inspection programs and customers[[4]](#footnote-4). Customers play a role in raising complaints to the municipality and educating themselves on what appropriate levels of compliance are. With provincial and municipal legislation focused on the protection of the public rather than the workers, tools like raising complaints and self-education about toxic chemicals remain with consumers and customers. Inspection programs are weak due to their focus on PSS cleanliness and not on worker education or training. With consumers and customers holding power, occupational hazards coming from chemicals or ergonomics are overlooked, and workers remain vulnerable.

Moreover, language accessibility to municipal regulations surrounding IPAC guides is limited to English in some municipalities. The majority of nail salon owners and workers are not native English speakers, making language a barrier to resource and information access. Offering materials in Vietnamese, Korean, and Chinese will increase understanding of inspection requirements for more nail salon owners. The City of Toronto offers “Eight Steps to Pass BodySafe Inspections” in English, Vietnamese, Chinese, Korean and more. The Region of Peel provides the “PSS Operator Information Guide” in English and Vietnamese. York Region, Halton Region, and Region of Durham provide PSS information in English. PSS operators, owners, and workers share responsibility for controlling infection outbreaks in their workplace, yet language barriers limit the majority of this industry from accessing public health information. The IPAC guide addresses the public health standards workers and owners must follow to pass an inspection. However, the guide does not address the occupational illnesses or injuries coming from nail salon products or workplace ergonomics.

As discussed above chemicals used in cosmetic products are controlled by Health Canada, while the Hotlist informs manufacturers of prohibited or restricted chemicals. A recent research study from the University of Toronto on discount nail salons in Toronto found high levels of (VOCs) and phthalates in personal care products (Singer, 2022). According to Arrandale, “Chemicals are getting into workplaces that weren’t used in these places, are being used in these places”, highlighting the loose regulation of chemical controls in nail salons (Jones, 2022). Without industry-specific legislation on chemical handling, and exposure levels, nail salons will continue to be inherently dangerous. Seo et al. (2019) state “[] the estimated 10, 000 chemicals found in nail products, only 10% have been tested for safety.” (2), showing how policy measures overlook the safety requirements within nail salons, nail salon products and the safety of nail salons workers. Broad federal and provincial legislation focuses on consumer protection, yet worker protection is pushed to the sidelines. Weak provincial regulations on hazardous chemicals found in personal products contribute to these illnesses and injuries. Workers are invisible to occupational health throughout the three levels of government, and adverse health outcomes are inevitable. It is clear that toxic chemicals are entering workplaces and are uncontrolled in PSS.

**Discussion**

In the section above I examined the existing research on how factors of citizenship status, gender, and how occupational health and safety is researched contribute to occupational injuries and illnesses. Moreover, I examined the current regulation surrounding the cosmetic industry. Weak points in legislation have trickled down into workplaces and have created environments where marginalized women are experiencing long-term adverse health effects. Prior research has addressed social factors as root causes of occupational injuries, but not much research exists on how cosmetic regulation, or the lack thereof, is another root cause of these adverse health outcomes.

Current cosmetic regulation has put risk management on consumers. At provincial and municipal levels, biological and chemical exposures to customers are prioritized over worker health and safety. With gaps in legislation failing to address the illnesses and injuries arising from nail salon products, a better policy cannot be created to mitigate occupational injuries in this industry. Implementing regulations has proven to be successful since manufacturers must comply with federal restrictions. For example, Health Canada has banned the use of bis(2-Ethylhexyl) phthalate and recent reports by the University of Toronto show that bis(2-Ethylhexyl) phthalate was found at low levels in nail salons (Singer, 2022). Strict enforcement combined with “green” products has had positive results in the United States, with toluene being found at extremely low levels (Ma et al., 2019). However, changing one’s social location is a larger challenge than pushing for stronger controls over an uncontrolled industry.

Government regulation of chemicals contributes to inequitable chemical exposure amongst these workers. The lack of chemical regulation in nail salons disproportionately affects Asian immigrant women, as they are overrepresented in the occupation. Regulated occupations and workplace settings like e-waste facilities have lower levels of chemical exposures showing that more regulatory intervention is needed to keep workers safe in workplace settings where hazards are invisible (Jones, 2022). A common theme in provincial legislation surrounding PSS was to protect customers, and “Workers are to ensure that their illness does not in any way endanger the health of clients” (IPAC, 2019, 56). But the industry depends on precarious workers, many immigrants, and part-time workers. Many may not have the means to take a day off and recover from an illness before returning to work. Understanding occupational health and safety beyond the micro-level is critical in understanding the root causes of occupational injuries and illnesses. Ford (2020) recognizes that efforts to reduce occupational injuries and illnesses are working, but they are short-term solutions like PPE and ventilation. Addressing the systemic causes of occupational illness must begin with addressing the overrepresentation of marginalized women in the industry. Stronger legislation surrounding the health and safety of these workers is critical and will be supported by occupational health and safety research that is focused on gender differences.

Federal legislation overseas the chemicals used in cosmetics and the labelling of products. Provincial and municipal levels set standards to mitigate and control infections in PSS. Protecting customers from biological and chemical illnesses seems to be the main concern, neglecting to address the occupational illnesses in nail salons. Community groups like the Parkdale Queen West Community Health Centre (PQWCHC) focus on addressing the lack of education given to workers on chemical hazards stemming from nail care products and how to mitigate adverse health effects. Although customers and workers are exposed to the same chemicals, workers experience prolonged exposure (Young et al. 2018). CTVNews reports that outreach partners are the PQWCHC are calling upon governments to establish standards around chemical exposure in nail salon settings (Jones, 2022). Demands for manufacturers to create safer products will inevitably contribute to a safer workplace, yet federal legislation must lead the effort to ban known toxic chemicals. CBC News, CTVNews, and CityNews use words like “unexpected” or “surprisingly high” when addressing the high levels of chemicals found in Toronto nail salons. Some chemicals found were “[…]30 times higher among nail salon workers relative to exposures in homes, and up to 10 times higher than in e-waste handling facilities,” (Singer, 2022). This discourse shows the lack of federal regulation, contributing to an inherently dangerous workplace that is overrepresented by marginalized workers. The weak regulation of cosmetics allows workers and consumers to be exposed to unpredictable levels of the chemicals.

But federal controls of prohibiting or restricting chemicals used in cosmetics can be effective, and it has been an effective measure in controlling the levels of some VOCs in nail salons. Stricter regulations and compliance from manufacturers will control chemical exposure to levels where occupational illnesses can be reduced. Government regulation must remain diligent in its enforcement and testing of cosmetics to ensure the occupational safety of nail salon workers. More ingredients that pose a risk to human health continue to be added to the Hotlist. In the nail salon industry, the push toward adding chemicals that are known as toxins continue. Worker safety in the nail salon industry has been overlooked. However, manufacturers and community organizations have stepped up to address the safety of workers at least for the short term.

Manufacturers have taken on some responsibility to create fewer toxic products, while community groups advocate for workers in the nail salon industry. Manufacturers have taken on the responsibility to omit toxic chemicals from their products, specifically the “Toxic Trio”. The “Toxic Trio” – made up of formaldehyde, toluene and dibutyl phthalate – is a common combination of chemicals found in nail products and exposure has known adverse health effects (White et al., 2019). Ford & Scott (2017) state, “Exposure to chemicals from the toxic trio and beyond can occur through dust and vapours; routes of exposure can be via skin, lungs, blood.” (55). These common routes of entry target specific parts of the body, resulting in symptoms like asthma and skin irritation. Young et al. (2018), Seo et al. (2019), and White et al. (2019) found causal relationships between exposure to the toxic trio and adverse health problems like asthma, cancer, and infertility. Exposure to dibutyl phthalate is toxic to the reproductive and development system, toluene is toxic to the development and nervous system, and formaldehyde is a human carcinogenic (White et al., 2015 and Young et al., 2018). Consistent exposure to these chemicals contributes to the inevitable occupational illnesses that nail salon workers face.

Marketing products as “3-free” has created a market for perceived healthier and safer alternatives for personal care products. However, manufacturers hold the decision-making power of which chemicals to phase out or omit. Young et al.’s (2018) study on 3-free nail products concluded that the market for “n-free” products is growing and manufacturers are eliminating chemicals one by one. “N-free” products are products that omit a variable number of hazardous chemicals. However, the elimination of select chemicals remains self-regulated by the manufacturer, thus products promoted as “n-free” are self-regulated (Young et al., 2019). The lack of government enforcement in totally banning the toxic trio from all cosmetics has allowed manufacturers to market themselves as a “safer alternative” or “green”. Substituting chemicals for “safer” alternatives pose a risk since product performance is important, and one harmful chemical may displace the previous harmful one (Young et al., 2019). Moreover, a strong business case motivates manufacturers to be “green”. With no legal requirement to omit toxic chemicals manufacturers hold the power to create cleaner products and use them as a method to increase profits. Beyond the toxic trio, other VOCs and phthalates continue to be used in nail salon products with minimal regulation.

The Nail Salon Workers Project based out of the PQWCHC stems from the California and New York Healthy Nail Salon Collaborative. PQWCHC (n.d.) states, “This program aims to learn about and reduce the negative health impacts of working in nail salons, and advocate for healthy and just work environments for nail technicians.”, as they address the occupational gaps left behind by federal and provincial legislation. This grassroots organization focuses on educating and protecting the marginalized and vulnerable nail salon workers in Toronto through training workshops executed by community outreach partners. Collaboration with nail salon workers and owners, and public health researchers has allowed the organization to provide research-based guides on mitigating chemical exposure leading to reproductive and respiratory injuries. Creating safer nail salons involves addressing how workers are exposed to hazards. Information brochures regarding occupational health hazards, illnesses (respiratory and reproductive), and ergonomics have been created and are accessible in English, Vietnamese, Chinese, and Korean. In the PQWCHC Training and Workshop Guide, ways to mitigate physical and chemical injuries are addressed. These measures are worker-centred, and workplace centred. Worker-centred strategies are frequent stretching, regular breaks, and training (proper positioning within work areas and proper positioning of customers during services). Workplace-centred measures include better ventilation and using physical barriers to reduce fumes and dust from staying in the air.

The nail salon workers project uses outreach programs led by local nail technicians to run training workshops to educate workers on how to protect themselves from the toxic chemicals found in their workplace. Nail salon workers enjoy their job yet protecting themselves from eminent hazards is inevitable due to the lack of chemical education and training in this industry (Griffin & Jordan, 2017 and Linor & Gordon, 2014). Angela Robertson (Linor & Gordon, 2014) states “we don’t want people to stop getting their nails done, but rather be aware of the dangers to the workers doing the nails”. Due to the lack of training and chemical handling regulation in this industry, salon owners bear the onus of worker safety training. PQWCHC outreach program coupled with collaboration with salon owners has led to more nail salon workers being educated about their occupational health and safety. This framework is worker-centred rather than the provincial and municipal consumer-centred approach.

**Conclusion**

It is not the fault of nail salon owners or workers that occupational injuries and illnesses are occurring. Instead, a broader perspective that includes social factors and government policy can explain how to nail salon workers are disproportionately experiencing adverse health outcomes in PSS. The invisibility of these workers is perpetuated by current policy measures due to their social location. The disposability of these workers is heightened due to the loose protections in the nail salon industry. The research done on occupational health and safety has historically neglected to look at the experience of working women due to the assumptions that they are doing “light work”. The thousands of small businesses employing an overwhelming amount of Asian immigrant or refugee women act as the final destination of this precarious pipeline. Adverse health outcomes are inherent in this occupation and marginalized women bear the cost of injuries and illnesses to their bodies.

Although adverse health outcomes of nail salon workers can be traced back to social factors as root causes, legislation as a root cause has been overlooked. The weak cosmetic regulation in Canada has resulted in a disproportionate number of Asian women experiencing occupational illnesses and injuries. As Health Canada permits toxic chemicals in cosmetic products, the onus is unfairly put on consumers to regulate their risk. Toxic chemicals that are not on the Hotlist continue to be used by manufacturers, despite the research that has correlated adverse health outcomes to VOC and OPE exposure. In the end, these toxic chemicals end up in nail salons, and workers are exposed to uncontrolled levels of chemicals. This toxic air is enclosed in small businesses supplied with marginalized workers who lack agency over their work environment. The legislation does not consider the various social factors that contribute to the occupational injuries and illnesses these women experience. The focus on the public has overlooked protection for these vulnerable workers. These workers are vulnerable on many levels since occupational health and safety research overlooks occupations dominated by women, and regulations to address mental stress from financial or family responsibilities are not measured. Legislation is a root cause of these occupational injuries and illnesses, but it cannot be seen in isolation. The outcomes of these policy measures are injured workers, while government legislation and social factors have pipelined marginalized women into this line of precarious work.

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1. Nail salon workers and nail salon technicians will be used interchangeably [↑](#footnote-ref-1)
2. Personal Care establishments include nail salons (Government of Canada, n.d.) [↑](#footnote-ref-2)
3. Consumers will be defined as any person using cosmetic products [↑](#footnote-ref-3)
4. Customers will be defined as any person who uses services from PSS [↑](#footnote-ref-4)