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A qualitative assessment of attitudes toward environmental-health concerns in Vietnamese -owned and -operated salons in the Greater Seattle Area

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A qualitative assessment of attitudes toward environmental-
health concerns in Vietnamese -owned and -operated salons in
the Greater Seattle Area

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May 18th, 2020

A thesis submitted to the faculty of the Environmental Studies Program in
partial fulfillment of the graduation requirements for the Degree of Bachelor of
Arts with honors in Environmental Studies

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Abstract

The nail salon industry is booming in the United States; however, business often occurs at the expense of safe working conditions and the well-being of nail salon workers. The workforce, many of whom are immigrant Vietnamese women, routinely handles products containing known carcinogens and endocrine disruptors. Furthermore, nail salon workers disproportionately experience negative health impacts from working in salons, including musculoskeletal disorders or respiratory issues. Environmental-health disparities in nail salons lies at a unique intersection of environmental, health, and social justice. This behavioral study assesses potential variables that impact the attitudes of Vietnamese nail salon workers toward environmental-health concerns within their salons. Variables include demographic background, health, personal behavior, salon management, and external influence. Using a qualitative research design, this study gathered primary data through semi-structured interviews of fifteen nail technicians and salon owners in the Snohomish and King County regions of Seattle, Washington. Results show that personal experiences and behaviors, including a prioritization of personal health, greatly influences attitudes toward environmental-health concerns. Additionally, Vietnamese nail salon workers and owners exhibit varying levels of concern about the health effects from working in salons; however, high rates of PPE usage were not correlated to concern over occupational health hazards in the salon. The ultimate goals of this study are to illustrate how Vietnamese nail salon workers understand and articulate their unique experiences and concerns toward health and safety in nail salons, thereby identifying and informing community or policy-based interventions to ensure healthy and safe nail salons. In uplifting this unique immigrant narrative and understudied environmental-health issue, this study seeks to expand environmental justice and equity work to incorporate immigrant narratives and experiences.

Acknowledgements

On the surface, this thesis appears to be the culmination of 9 months of intense research. However, as a first-generation college student raised by two Vietnamese immigrants, one being a former nail salon worker, I view this thesis a culmination of my life experience. I feel incredibly grateful to have conducted such meaningful research that sheds a light on this understudied, underrepresented, and resilient population and pursue a project that honors both my Vietnamese-American experience and vision of environmental justice.

To Gail Carlson, for being an excellent advisor. Your unwavering support and enthusiasm truly shaped this project and your guidance motivated me to continue bravely wading into this unpredictable process. Your sharp eye also pushed me improve my writing and clearly articulate my ideas.

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To the Environmental Studies Program, I would not be who I am today without you. Thank you for being my home at Colby.

To the women and men who were so willing to talk to me and share their experiences, I hope that this work honors your experiences and highlights our resilient, beautiful Vietnamese community.

To my family, this degree is yours just as much as it is mine. My academic achievements are because of you, and I hope I've made you proud.

To my mom. Thank you for connecting me with all my respondents, for being so dedicated to this process and work, and for only being a call away when I had a question or needed a translation. This entire project exists because of you.

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INTRODUCTION

The U.S. nail industry is booming. Between 2006 and 2016, the number of nail salons doubled (UCLA Labor Center, 2018). In 2017, \$8.53 billion was spent on nail services (2017-2018 The Big Book, 2018). Over the next decade, employment in the nail salon industry is predicted to grow by 13%, a rate double those of many other US occupations (UCLA Labor Center, 2018). Therefore, the industry will continue to grow.

Over the past 20 years, nail salons have become fixtures in American towns, cities, neighborhoods, and malls (Roelofs and Do, 2012). The industry employs a largely immigrant and female workforce (UCLA Labor Center, 2018; Hu et al., 2011). By offering quality manicure and pedicure services at discounted rates, immigrant-owned and run salons appeal to and serve a diverse range of clientele across the United States (Roelofs et al., 2007). Furthermore, nail salons offer important avenues for economic growth and serve as opportune business ventures for recent immigrants with limited English proficiency and employment options (Pavilonis et al., 2018). Of the 126,300 nail salon workers identified by the Bureau of Labor Statistics, 76% identify as Asian and at least 45% of those workers identify as Vietnamese; therefore, the nail salon workforce is primarily composed of Asian immigrant woman (AAPCHO, 2016; Huynh et al., 2019; UCLA Labor Center, 2018; White et al, 2015).

On the West coast, Vietnamese immigrant women dominate the nail salon workforce. Their dominance in the nail industry can be traced to the early 1970s, when Hollywood actress Tippi Hedren trained Vietnamese refugee women to perform manicures in Southern California salons (Garcia-Navarro, 2019; UCLA Labor Center, 2018). Since then, Vietnamese immigrants have been closely associated with the growth of the professional nail salon industry in the U.S. (Eckstein and Nguyen, 2011). In the U.S., the Vietnamese community has transformed the nail salon into a convenient service that caters to lower-to-middle income clientele and simultaneously built the nail salon industry as a core economic support for the community (Roelofs et al., 2008; UCLA Labor Center, 2018). Given their large majority within the industry and disproportionate vulnerability to occupational risks as described below, the experiences and attitudes of Vietnamese immigrant women doing nail care deserves separate and specific study.

As salons are highly frequented and open to the public, many presume that these workplaces are safe (Gorman and O'Connor, 2007). On the contrary, nail salons can be highly-toxic, hazardous environments for both workers and consumers. Workers routinely handle products containing known carcinogens, reproductive toxins, and other harmful materials that can lead to acute or chronic impacts to the endocrine, respiratory, neurological, and musculoskeletal systems (AAPCHO, 2016; Shendell et al., 2017; see Table 1). Over time, these products can lead to significant health effects, ranging from mild rashes and chronic headaches to reproductive issues or cancer (Porter, 2009; see Table 1). For instance, a recent study of Colorado nail salons found a 20-year exposure to formaldehyde and benzene would significantly increase cancer risk in nail salon workers (Lamplugh et al., 2019). Although research on chronic impacts of long-term exposure to common nail salon chemicals is limited, several studies have identified or assessed reported acute health impacts from nail salon work. The most common reported acute health impact was work-associated eye, nose, throat, and skin irritation (Harris-Roberts et al., 2011; Shendell et al., 2017; Shendell et al., 2017; Quach et al., 2008; Quach et al., 2011; White et al., 2015). For some workers, respiratory irritation manifested in shortness of breath, chest tightness, and difficulty breathing (Quach et al., 2011; Seo et al., 2019a). Headaches and lightheadedness were also commonly reported symptoms (Quach et al., 2008; White et al., 2015). It is likely that these health symptoms are associated with solvent exposure (Quach et al., 2008). Furthermore, an Oregon-based study identified exposure to acrylics, which use more toxic materials than standard manicures and pedicures, as a trigger for respiratory allergies in workers (White et al., 2015).

Another common health impact related to nail salon work is chronic musculoskeletal pain or discomfort, particularly pain in the shoulder, lower back, hands, and wrist (Harris-Roberts et al., 2011; Huynh et al., 2019; Quach et al., 2008). Typically, these symptoms are associated with poor posture, placing too much force on hands, and consistently holding awkward or uncomfortable positions when handling customer's hands and feet (Huynh et al., 2019). One study found significant evidence that working practices and postures of nail care workers related to elevated rates of musculoskeletal disorders; specifically, muscular strain on neck, lower back, hands, and wrists were magnified when performing work that is visually demanding in a fixed location (Harris-Roberts et al., 2011).

Table 1. Potential symptoms and health effects resulting from overexposure to common ingredients in nail salon products. (Sources: as listed, and adapted from the EPA)

Ingredient	Use	Risk
Acetone	Nail polish remover, fingernail glue remover	Headache, dizziness, irritation to skin, eyes, throat
Dibutyl phthalate*	Nail polish, nail hardener	Irritation to eyes, stomach, upper respiratory system. Prolonged exposure to high concentrations can be hazardous to reproduction and development. Known androgenic endocrine disruptor
Formaldehyde*	Nail hardener	Known carcinogen. Linked to dermatitis or irritation to the eyes (Gorman and O'Connor, 2007)
Methyl Methacrylate	Artificial nails	Irritation to eyes, skin, nose, mouth; shortness of breath, skin rash; nerve damage (Avitzur, 2010)
Toluene*	Nail polish, fingernail glue	Eyes and nose irritation; weakness, exhaustion, confusion, dizziness, inappropriate feelings of happiness, headache, inability to sleep, feeling of numbness/ tingling; serious overexposure can lead to liver and kidney damage

In recognition of these pressing health concerns, some nail care product manufacturers (i.e. OPI, Sally Hansen) have reformulated their polishes to remove toxic products, most notably the “toxic trio”, the most well-known group of toxic chemicals used in nail products: dibutyl phthalate (DBP), formaldehyde, and toluene (see Table 1; Gorman and O'Connor, 2007; Seo et al., 2019a; Shendell et al., 2017). However, the effectiveness of these substitutions is debated, as some companies have only replaced toxic ingredients with other toxic substances and there may be a false sense of security that these are safer products (UCLA Labor Center, 2018). Overall, nail salon owners and technicians are constantly working in highly-toxic environments full of volatile chemicals with a potential to adversely impact their health (Shendell et al., 2017).

In addition to environmental-health concerns, Vietnamese nail salon workers are especially vulnerable to health and safety risks. They are likely drawn to nail salon work because of its short training period, limited English requirements, and convenience, as salons are often owned by family and friends and tend to be in local neighborhoods (Huynh et al., 2019; Quach et al., 2015). However, the short training period, combined with their limited proficiency in English, likely results in limited communication of environmental-health risks to workers by their managers, the industry, and/ or product manufacturers. Until recently,

health and safety training materials were only available in English and informational materials regarding workplace hazardous materials were not easily accessible (Shendell et al., 2017). Additionally, various linguistic, cultural, and socioeconomic factors could prevent Vietnamese immigrant workers from accessing mainstream health and safety services or advocating for their health (Doan and Dye, 2006).

Nail salon workers, including Vietnamese workers, are also vulnerable to labor and wage abuses. The hourly median wage for nail salon workers is low and, at times, lower than minimum wage (UCLA Labor Center, 2018; Nir, 2015). A watershed 2015 *New York Times* article revealed a host of labor, health, and safety abuses of immigrant nail salon workers, including humiliation by owners and unsanitary working conditions (Nir, 2015; UCLA Labor Center, 2018). Additionally, nail technicians are either classified as employees or independent contractors. Contractors are more restricted in their ability to collectively bargain over their working conditions and lack protections from discrimination, harassment, or retaliation (UCLA Labor Center, 2018). Furthermore, while some nail salon workers maintain close relationships to business owners, there is still a fear of employer retaliation that can prevent workers from reporting hazards (UCLA Labor Center, 2018). This suggests salon management practices or structure could affect attitudes towards or implementation of environmental health practices in nail salons.

Despite these disproportionate health and socio-economic vulnerabilities, the local and federal policy landscape regarding nail salon health protections or nail product testing is fragmented and uneven (Hu et al., 2011; Huynh et al., 2019). At the federal level, two agencies provide some oversight over nail salon workers: the Occupational Safety and Health Administration (OSHA) and the Food and Drug Administration (FDA). Although OSHA has set permissible exposure limits (PELS) to minimize exposure to certain chemicals in nail salons, such limits are outdated and fail to take into consideration the combined effects of multiple chemicals, long-term effects, or skin absorption as a route of exposure (Gorman and O'Connor, 2007; Environmental Law Institute, 2007). Furthermore, although OSHA requires employers to provide Safety Data Sheets for salon products containing toxic chemicals, workers are usually not trained in safe chemical handling and sheets have not been translated to appropriate languages reflecting the workforce (Shendell et al., 2017; UCLA Labor

Center, 2018). In addition, nail products sold in the United States must be free of poisonous substances; however, the FDA does not approve or review nail products before they enter the market (Gorman and O'Connor, 2007). Instead, the FDA relies on a "Cosmetics Voluntary Registration Program", which allows cosmetics manufacturers to voluntarily report to the FDA about adverse reactions to products (Gorman and O'Connor, 2007). In addition, in the absence of FDA authority, cosmetic manufacturers have opted to self-police through the Cosmetics Ingredient Review Board (CIR) (Gorman and O'Connor, 2007). However, CIR has only reviewed 11% of the 10,500 nail care products ingredients listed by the FDA (Roelofs et al., 2008). Regarding labor rights, there is little federal effort and limited state agency effort to utilize policy to protect workers against wage abuses and unsafe working conditions (UCLA Labor Center, 2018).

In the absence of federal regulatory oversight over the nail salon industry and workers, some states and advocacy groups have stepped up to promote healthier and safer salons. For instance, the California Safe Cosmetics Act requires cosmetics manufacturers to report products that contain ingredients known or suspected to cause cancers or reproductive harms (California Department of Public Health, 2018). Furthermore, the law establishes a database of chemicals through the California Safe Cosmetics Program (CSCP) to ensure that salon professional can access product safety information (Women's Voices for the Earth, 2018).

Additionally, several advocacy groups have supported organizing within the nail salon community. The New York Healthy Nail Salons Coalition (NYHNSC) was founded in 2014 to support worker-led strategies for labor rights, reproductive health, occupational health, and public interest law. NYHNSC has also advocated for better translated materials and assisted studies to track worker health symptoms and safety trainings (UCLA Labor Center, 2018). In regards to the Vietnamese nail salon worker community, the California Healthy Nail Salon Collaborative has paved the way for activism within Vietnamese communities and proactively addresses health and safety concerns through policy advocacy, research, outreach, and education (Porter, 2009; UCLA Labor Center 2018). Most notably, the Collaborative has advocated for California counties and cities to adopt a Healthy Nail Salon Recognition Program, which incentivizes salons to utilize safer and healthier products (UCLA Labor Center, 2018). Similar city-based initiatives focusing on training, materials

translation, and worker health have emerged in Boston, Massachusetts (The Safe Nail Salon Project) and Portland, Oregon (Oregon Healthy Nail Salon Collaboration) (White et al., 2015).

In Washington State, there has been some effort by state agencies and advocacy groups to protect or maintain healthy work environments for nail technicians. For one, Washington is one of 32 states that have banned methyl methacrylate (MMA), a highly toxic irritant (Methacrylate Producers Association Inc., 2012). Additionally, the Washington State Department of Licensing (DOL), the main agency overseeing health and safety of nail salon workers in the state, issues licenses for nail salon businesses, technicians, and sends out inspectors every two years to check salons for health or labor violations (Dang and Foster, 2013). The DOL also regulates sanitation and disinfecting standards for nail salons, as well as requires nail care products (i.e. acetone, alcohol) to be properly labelled (Dang and Foster, 2013).

Most notably, since 2007, the DOL has required Washington State nail salons that were built after 2007 to install local exhaust ventilation systems at each manicure table; however, this policy allows salons built pre-2007 to operate without local exhaust ventilation systems (Local Hazardous Waste Management Program in King County, Washington, 2014). Lastly, similar to the California Healthy Nail Salon Collaborative, the King County Local Hazardous Waste Management Program previously certified local salons through its “Healthy Nail Salons” and EnviroStars Green Business program (Healthy Nail Salons, n.d.; UCLA Labor Center, 2018), indicating some concern toward environmental health in salons in the region. However, the effectiveness of these policy initiatives is limited. For one, the Healthy Nail Salon recognition program was discontinued in 2017 due to the program director retiring and budget cuts. Furthermore, at the state and federal level, little is done to actively regulate toxic ingredients in nail care products or limit exposure to hazardous chemicals. Even less is done to ensure that safety information or warnings about toxic chemicals are translated for a profession with many with limited English proficiency; also, many documents are written in highly technical language (Seo et al., 2019a; UCLA Labor Center, 2018). Without proper protections or oversight at the local and federal level, these

women are at serious risk. Therefore, nail salons lie at the unique intersection of environmental, economic, and reproductive justice (Liou et al., 2014).

The environmental-health impacts on this predominantly immigrant workforce, many of whom are Vietnamese, has garnered attention from mainstream media, public health practitioners, regulatory agencies (mainly labor), and community-based organizations and activists (Tam, 2004). While research on the health and safety of U.S. nail salon workers, particularly Vietnamese workers, is limited, much of the existing published work has focused on health and safety conditions, acute health impacts from short-term toxics exposure, and labor conditions in California, Massachusetts, and New York (Harris-Roberts et al., 2011; Shendell et al., 2017; Quach et al., 2008; Quach et al., 2011; White et al., 2015). Relevant studies rarely assess the barriers and incentives to adopting healthier and safer occupational practices in salons and the behavioral factors that inform these challenges and opportunities; only one Philadelphia-based study conducted a qualitative analysis of behavioral variables influencing health and safety practices among Vietnamese nail technicians (Huynh et al., 2019). Therefore, this project attempts to fill this research gap by assessing variables, including demographics, personal behavior, perceived health status, salon management and environment, and external factors, that influence the perception of Vietnamese nail salon workers toward various environmental-health concerns and to focus on Seattle-area salons, a location that has not been studied previously.

This project aims to answer three questions: (1) Which variables predominantly shape the attitudes of Vietnamese nail salon workers toward environmental-health concerns? How do these variables interact to shape such attitudes? (2) How do Vietnamese nail salon workers understand and articulate their unique experiences and concerns toward health and safety in nail salons and (3) What health and safety measures are Vietnamese nail salon workers using to protect their health?

Utilizing a qualitative research design, I collected primary data through surveys and semi-structured interviews at Seattle-area salons. Overall, this project highlights how Vietnamese nail technicians in the Seattle area understand and protect environmental-health in their workplace. The goal of this qualitative analysis is to better inform community-based or policy-based interventions to ensure nail salon professionals are working in healthy and

safe conditions. In addition, by specifically exploring the experiences of Vietnamese workers in the Seattle area nail salon industry, this study aims to give voice to an understudied population and uplift a unique immigrant-based narrative to expand the scope and potential for environmental justice and equity work within this community.

METHODS

Describing the Study Area

I utilized a case study approach of salons in the Greater Seattle Area, defined as Snohomish or King County, Washington, or the “Sno-King” area, a typical delineation of the Greater Seattle or Seattle Metropolitan Suburban Area. King County and Snohomish County have the highest number of Asian-Americans in Washington State (Asian Americans Advancing Justice – Los Angeles, 2015). In the Seattle Metropolitan Suburban Area (MSA), there are over 62,000 Vietnamese individuals; 52% of this population is considered limited English proficient and 85% of Vietnamese speak a language other than English at home (Asian Americans Advancing Justice – Los Angeles, 2015). Furthermore, there are approximately 1073 nail salons and 7,300 nail technicians in the state (2017-2018 The Big Book, 2017; UCLA Labor Center, 2018). Specifically, King County has been identified as among the top counties in the U.S. with the most nail salons (UCLA Labor Center, 2018). In addition, King County previously certified “Healthy Nail Salons” through its Local Hazardous Waste Management Program (Healthy Nail Salons, n.d.; UCLA Labor Center, 2018), indicating some concern toward environmental health in salons. Snohomish County was chosen given its abundance of convenience samples and high concentration of nail salons. Therefore, both counties represent appropriate locations of study and representative of the Greater Seattle Area designation.

To obtain a license to work as a manicurist or pedicurist in Washington State, individuals must be at least 16 years old with a high school diploma (or its equivalent) and undergo 600 hours of training at licensed and accredited beauty school with a nail technician program. Such programs should be approved by the Washington State Department of Health and Workforce training and Washington State Department of Licensing (“How to Get a Nail Technician License in Washington”, n.d.; “Washington State Department of Licensing”, n.d.). After completing the course, individuals are required to take and pass a practical and written exam, which is available in a number of non-English languages to increase access to the profession (“How to Get a Nail Technician License in Washington”, n.d.; “Washington State Department of Licensing”, n.d.). Alternatively, aspiring technicians can also complete a state-approved apprenticeship program and take the exam in order to earn their license (“Washington State Department of Licensing”, n.d.). Technicians are expected to be trained

in nail care and salon safety and management; however, it is unclear whether technicians are trained in safe chemical handling or healthy use of products containing chemicals (How to Get a Nail Technician License in Washington, n.d.; Shendell et al., 2017).

Data Collection

This study utilized qualitative methods of inquiry and primary data in the form of formal, semi-structured interviews. Based on a literature review conducted in the fall of 2019, two surveys were designed to target either Vietnamese nail salon workers or owners (see Appendix 1). Surveys were organized into five distinct categories based on the variables anticipated to be important in influencing perspectives of environmental health concerns: demographics, health, personal behavior, salon management, and external factors. Both surveys consisted of 28 questions that were a mix of ranked, multiple choice and short answer questions. Survey questions were designed based on a review of pre-existing research on nail salon workers' health. In addition, survey questions attempting to determine various salon management and health and safety practices were derived from the King County criteria for designation of Healthy Nail Salons (Healthy Nail Salons, n.d.). The surveys were pre-approved by Colby College's Institutional Review Board to ensure against ethics violations, given the sensitive questions related to health and occupational hazards.

Recruitment of Interviewees

Huynh et al. (2019) noted that pre-existing connections with and referrals from current or former workers, friends, and relatives are vital to securing Vietnamese interviewees. Based on this finding, all interviewees were recruited using convenience sampling methods, which refers to participants introduced to the researcher through personal connections or informants, including former nail technicians and nail salon owners (Huynh et al., 2019). In total, 15 participants were interviewed across 10 salons; 2 in King County (Kenmore, WA and Kirkland, WA) and 10 in Snohomish, County (Edmonds, WA; Everett, WA; Lynnwood, WA). All study participants but one identified themselves as Vietnamese women. One participant identified as a Vietnamese male nail salon worker. Of the 15 interviewees, 3 identified as Vietnamese female nail salon owners. One salon was a hair salon that included nail services.

Interviews

Interviews were conducted between January 12 – 22, 2020. 14 out of 15 interviews took place in person; one took place over the phone due to conflicting schedules around Lunar New Year. Interviews were conducted both in and outside salons; eight interviews were conducted inside the salons during workdays, whereas seven interviewees were conducted in the subject's home on their days off or after business hours. Because business is typically slower in the winter, salons were visited in January typically before 1 p.m. to maximize interviewee availability and minimize interference with clients and operations. Interview duration ranged from 10 to 50 minutes. 14 out of 15 interviews were conducted in Vietnamese with minor translation assistance provided by the primary informant. One interviewee was conducted almost entirely in English. Interviewees were asked the pre-designed survey questions, but given the semi-structured nature of the interviews, conversations ran their own course and interviewees gave varying lengths of answers depending on their comfort with the question and interviewer. All interviews were recorded, and notes were taken by hand. After each interview, interviewees were compensated with a \$20 gift card to a local coffee chain. Following the interview process, all interviews were transcribed and coded, by hand.

RESULTS

Study Sample and Characteristics

Most interview subjects identified as female, worked as technicians, possessed at least a high school degree, and immigrated to the United States (see Table 2). Only one participant was born in the United States and was primarily educated in the American education system. Of the participants who identified as immigrants, several immigrated to the United States as little as three years ago, to at most 24 years ago. The age of subjects ranged from 20 to over 60. All but one participant who identified as immigrants had completed their education in Vietnam; only one recent immigrant reported attending a local community college. Furthermore, most participants ranked their English as ‘normal’ during interviews, but this was interpreted as a ranking of ‘average’ or ‘fair’ by the researcher. At the salons, interview subjects worked an average 8.5 hours per day and noted that, in the winter months, work was much slower compared to a very busy summer season.

Table 2. Demographic of study participants (N=15). *Respondents were asked to rank their perceived English-speaking level, from poor to excellent.

Characteristic	N	%
<i>Number of salons represented</i>	10	
<i>Salon position</i>		
Owner/ Manager	3	20
Technician	12	80
<i>Gender</i>		
Female	14	93
Male	1	7
<i>Age in years</i>		
24 – 32	3	20
33 – 41	4	27
42 – 50	4	27
51 – 59	3	20
60 or over	1	6
<i>Household size</i>		
Less than 4	3	20
4	7	47
More than 4	5	33
<i>Years lived in the U.S.</i>		
3 – 7	5	32
8 – 12	4	27
13 – 17	4	27
18 – 24	1	6
40	1	6

<i>English-speaking level*</i>		
Poor	3	20
Average / Fair	7	47
Good	4	27%
Excellent	1	6%
<i>Education level completed (in the U.S. or Vietnam)</i>		
Middle school	2	13%
High school	9	60%
Some college	1	7%
College	3	20%

There was also considerable variability in the work experience of the interview subjects. Prior to their work in the nail salon industry, subjects noted they worked as street sellers in Vietnam, accountants, a bartender, and a teacher. A few participants noted that they had worked in the beauty industry for most of their career, both in Vietnam and America, specifically in nail care. In addition, subjects reported working in the nail industry for as little as 2 years to as many as 37 years; therefore, not all participants pursued nail work as a long-term career.

Health

Interviewees were asked whether they had noticed changes to health since beginning work in a nail salon, to report their current health status, and to report perceived health impacts related to nail salon work. Interviewees consistently identified and expressed their experience with adverse issues related to toxics exposure in nail salons, including product smell, poor air quality, and respiratory irritation due to product odor. However, when asked whether they had noticed changes in their health since beginning nail salon work, most interviewees stated they had not observed changes to their health. In fact, most individuals reported normal or ‘average’ health. Given the low concern about health effects from nail salon work, few participants reported specific health effects related to nail salon work (see Table 3). The same respondents listed multiple health effects including skin irritation from product use, respiratory irritation from product fumes (i.e. difficulty breathing, dry nose), and musculoskeletal pain, particularly soreness or exhaustion of the hands, wrists, shoulders, and back (see Table 3). Although most respondents characterized these issues as annoyances, one respondent remarked on the severity of their respiratory irritation:

“I feel that I am more bothered by the sulfurous smells of the toxic products [acetone] as time goes on. I cannot stand the smell. Good thing that you can’t smell it, because it’s really strong. If you try to smell it, it’ll make you dizzy, and you’ll immediately get a bloody nose. I get a bloody nose immediately. If it does not stop, it can go on till the next day and keep bleeding. Sometimes, it’ll stop bleeding but my nostrils will get so dry and uncomfortable that it makes it very hard to breathe” (Female nail technician)

This respondent also points out that dizziness is another health symptom from nail salon work. Furthermore, this respondent explains that the trigger for these adverse health effects was likely acetone. Therefore, since the status of one’s health and experienced health impacts frequently appeared in response to questions or conversations about toxic exposure, this suggests that perceptions of health (one of the variables identified a priori) played some role in shaping respondent’s attitude toward environmental-health concerns.

Table 3. Self-reported health status and effects associated with salon work.

Health	N	%
<i>Noticed change to health since beginning work in nail salon</i>		
Yes	4	27
No	11	73
<i>Current self-reported health status</i>		
Extremely well	1	6
Normal or Average	12	80
Poor	1	6
<i>Self-reported health effect from nail salon work</i>		
Skin irritant	4	27
Musculoskeletal (soreness or tiredness in hands, wrists, shoulders, back)	2	13
Respiratory irritation (i.e. difficulty breathing, coughing)	4	27
Exhaustion or low energy	1	6
Dizziness	1	6
Headaches	1	6
Age or getting older	2	13

Interviewees were split when asked whether they were concerned about the health effects from working in a salon. Whereas some respondents noted they were not concerned at all (N=5), others expressed extreme concern over their health (N=5). All three nail salon owners responded that they were ‘not concerned at all’ about health effects from nail salon work, while those who reported high levels of concern over the health effects from nail salon work identified as nail technicians (N=5). When asked whether participants believed these health impacts were related to nail salon work, several technicians stated that their work appeared to trigger these health symptoms. Additionally, two of the respondents who had expressed ‘extreme concern’ regarding their health expressed their desire to leave nail salon work to prevent further exposure to toxic chemicals.

“I have thought about quitting. If there was an opportunity... I would quit, and not “do nails” anymore. Because of my health” (Male nail technician)

Another respondent who expressed similar desires to leave reported working on an ‘on-call’ basis. They also explained that they observed differences in their health when they worked in the salon versus when they took breaks from salon work, and that these breaks made them highly perceptive and disdainful of health hazards related to nail salon work.

In contrast to the extreme concern observed in these two technicians, respondents noted several reasons why they were unconcerned about potential health effects. First, two participants denied links between these health risks and their occupation and, instead, attributed risks to non-occupational health determinants like age. In citing age, one respondent remarked that their consistent access to reliable health care alleviated their concern toward potential health hazards from nail salon work. Second, two owners denied a relationship between occupation and health concerns and stated that salon health and safety measures (i.e. using disposable liners for the foot basins, closing containers properly, and installing ventilation systems) helped to limit health issues. Third, one owner adamantly stated that technological improvements over time limited product toxicity and, thereby, any occupational health effects. This owner was born and educated in the United States and possessed a long family history of working in the nail industry or selling filtration system. She agreed her ability to speak English supported her aptitude in acquiring and utilizing different technologies to improve salon health and safety. Lastly, one respondent expressed

headaches or exhaustion were a normal part of nail salon work rather than related to salon products, and, therefore, they were unconcerned about occupational health impacts.

In summary, respondents demonstrated mixed perceptions of personal health as well as occupational-related health impacts. Most respondents felt that their health was normal and did not believe that their health had changed since beginning nail salon work. Although some respondents reported adverse health impacts related to nail salon work and adamant about the severity of such impacts, other respondents expressed low levels of concern over health symptoms. Furthermore, several respondents argued that the reported health impacts, including musculoskeletal pain, respiratory irritation, or headaches, were related to non-occupational health determinants rather than nail salon work, and therefore, a non-issue. These mixed reactions regarding health suggest that health could play some role in influencing attitudes toward environmental-health issues in salons.

Personal Behavior

Respondents were asked a series of question regarding their perception of environmental-health harm and the action they took to mitigate such harm, which I refer to as ‘personal behavior’ traits. When asked if they were aware of toxic chemicals in nail products, most interviewees noted they were aware. A few elaborated that the chemicals were “not good” for one’s health. Based on the participants responses, I identified and defined four ways that respondents built up their knowledge of toxic products and adverse health effects from nail salon products (referred to as ‘ways of knowing’): (1) personal experience or observation, (2) schooling or certification class, (3) external sources to the nail salon, and (4) product smell (see Table 4). Respondents reported a combination of ‘ways of knowing’, but personal experience and observations was the most reported (see Table 4).

Table 4. Identified ways of knowing or understanding health effects related to nail salon work (N=15).

Ways of knowing	N	%
Personal experience or observation	8	53
Certification classes or schooling	5	33
External sources (i.e. booklets, product labels, or product manufacturer information)	3	20
Product smell	4	27

Personal experience refers to the ways in which participant's lived, every day experiences informed how they understood their profession, the dangers of their profession, and the personal action that they could take in alleviating perceived harm – particularly the personal protective equipment and health and safety practices described below. Participants highlighted the significance of personal experience and observation in building awareness of environmental-health harms by either stating that they “already knew of” harms or that toxic products was “something they just know”. When asked to elaborate, interviewees were confused and reiterated that their understanding of toxic products was built through years of working in the industry. For instance, one participant stated:

“I kind of learned [of the chemicals] and experienced it on my own – so I figured it out myself” (Female nail technician).

Furthermore, owners and technicians remarked that knowledge was also passed down in the salon space. For instance, when asked about the implementation of health and safety practices, an owner remarked:

“I learn or take advice from the people who came before me, or who were already in the industry. And we follow them, but then we adjust what we learn to fit our own experiences and implement that” (Female nail salon owner)

Schooling or certification class referred to the course interviewees took to learn the basics of nail salon work and obtain their license. Several participants noted that their certification classes initiated their personal awareness of toxic products (N=5). One owner enthusiastically recounted the rigor of her various beautician courses. Specifically, she recalled how one course tested her on her knowledge of the different chemical compounds that comprised common nail salon products, such as acetone, and throughout the interview, she pointed to different products and explained their chemical composition.

External sources of information included booklets on nail salon work, product labels, and manufacturer provided information on nail salon products. Although over a third of respondents (N=5) reported previously reading product safety information, only three respondents stated that these external sources of information helped improve their knowledge and understanding of toxic products (see Table 4).

A handful of respondents used “smell”, or the strong, abrasive aromatic qualities of chemical products, to articulate their understanding of product toxicity, chemical exposure, and poor air quality. Throughout interviews, respondents remarked on the different strong and uncomfortable smells in a salon space and stated that the stronger a product smelled, the more harmful or toxic it was. Within conversations, respondents consistently described strong smelling products as “not good”, “highly chemical”, or “toxic”. Furthermore, respondents expressed that the more aromatic a chemical was, the greater the perceived health risk. When asked to describe which products smelled strongest and, thereby, were the most dangerous, one participated responded without hesitation:

“the acrylics, the liquids. Mostly because, acetone sometimes. But acrylics, you’re using your hands and it goes into your nose. And you’re breathing – you’re breathing in the dust along with the smell” (Female nail technician)

Therefore, a consistent association of “smell” with toxics exposure could suggest that smell played a significant role in shaping an individual’s understanding of toxic nail products. In contrast, respondents expressed that a lack of smell indicated a lack of health risk. As one respondent pointed out:

“...because the air is well-ventilated, so you don’t smell the acetone or any other smells. The ventilation gets rid of it...” (Female nail technician).

Furthermore, when asked whether they believed nail salon products were toxic, an owner utilized their salon’s lack of smell to justify a lack of concern or denial over potential health harms.

“I’ve been doing this since I was 16. So I don’t smell it anymore... I don’t feel it anymore. Even when I first started, I never went home and went like, ‘Oh my god, these chemicals are making me dizzy and headache-y... You know how Vietnamese people are. They’re like, ‘oh, you can smell it, it’s not good.’ But you have to understand, when these people come out with new products they do all the testing, so it’s obviously safe...” (Female nail salon owner)

Interestingly, despite denying an association between product smell and health harms, this owner still expressed wanting to invest in ventilation services to reduce smell and

maintain good air quality. Smell was also used to describe poor salon air quality and determine the quality of a salon's services; if a salon smelled "really bad" or strongly of chemicals, it was perceived as "dirty", low-quality in services, and an unhealthy work environment. As one respondent noted,

"if there was a strong smell [in the salon], I wouldn't work there. Like for example, this salon over here. (Points outside and begins to whisper) generally, that salon is too small. I hear people saying that that salon has a really strong smell" (Female nail technician).

The respondent's hushed tone when describing the nearby salon suggests some discomfort with the odorous salon and suggests a negative perception of the salon. Therefore, smell helped respondents both identify and justify their concerns of potentially "dirty" or unsafe workplaces. Similarly, several respondents frequently compared the air quality at their current salons to either salons they previously worked at or competing salons in the area. These respondents passed judgement on the other salons and stated that, due to strong smells of acetone and nail polish remover, these salons were "not as good" or clean as their workplaces:

"I've worked in a lot of shops, and this one is better. There are lots of other shops that have really poor air quality and are really dirty..." (Male nail technician)

Personal behavior traits, including ways of knowing, seemed to influence how participants protected themselves from perceived adverse health effects. For one, several participants noted that cleaning served multiple purposes including maintaining the shop's hygiene and safety, allowing them to fulfill a certain shared responsibility within the salon, and helping them to protect themselves from exposure to various chemicals. Second, in addition to the salon's ventilation, a number of participants mentioned that they took it upon themselves to open the doors for additional ventilation. Specifically, one interviewee stated that they felt the centralized ventilation system was inadequate in mitigating the smell, and thereby toxic exposures; however, they felt that opening the front and backdoors created a more comfortable and preferable space as well as ensured higher air quality. They expressed that other salons should follow suit:

“If you [the researcher could change anything, then in the summer people need to open the doors. Then [the salon environment] would be (in English) ‘okay’... (in Vietnamese) ventilation is not really that beneficial. It’s not enough” (Male nail technician)

Third, the most popular form of personal protective measures across all interview subjects were masks and gloves, a form of personal protective equipment (PPE). All but one interviewee reported wearing a mask or gloves at all times in the salon and during an interaction with a customer (N=14). Respondents who wore masks at all times expressed their desire to protect against acrylic dust, other forms of particulate matter, and reduce exposure to chemicals. For example,

“When I am working with other things that can be less safe, like when I am filing someone’s toenails, then I will wear a mask. When I am doing acrylics, then I will wear masks. If I am using the chemicals or other toxic products, I’ll wear the mask” (Female nail technician)

However, despite interviewee insistence that they never took their mask off and the importance of using PPE to protect their health, while personally observing a salon, I noticed that none of the employees were wearing masks while interacting with clients. When asked about glove disposal, most interviewees stated that gloves were single-use and replaced after every client. One respondent, quite agitatedly, clarified that they would wear PPE only when a customer was present. Another respondent, who reported that they wore masks and gloves “most of the time”, stated that they only took the gloves off for services that required skin-on-skin contact, such as massages during pedicures; other respondents agreed with this action. Some interviewees even mentioned wearing two gloves to add a further layer of protection against chemical exposure to the skin, as gloves could tear during the service. However, many expressed feeling uncomfortable when having to remove their gloves to perform certain services, due to fears of skin irritation, chemical exposure, or transfer of bodily fluids and bloods from cuts or sores on the client.

An uncommon personal protective action was taking breaks outside of the salon space. Although most respondents reported taking breaks during the workday, particularly when they did not have clients, most interviewees stated they took breaks indoors (typically

in the break room). Only two respondents reported going outside in order to take a walk, get some fresh air, or engage in light exercise, with the specific intent of avoiding unnecessary exposure to fumes in the salon. These respondents who chose to take breaks outside expressed strong opinions about salon air quality and reiterated the relationship between smell and toxicity.

As later discussed, health and safety practices, like PPE or maintaining a clean and hygienic salon environment, were required as part of salon management. However, throughout interviews, participants adamantly stated that they were motivated to utilize these practices due to a sense of personal responsibility, more so than fulfillment of their responsibilities as employees. For example, when questioned whether owner's or salon policies dictated their use of PPE when interacting with clients, one participant stated:

“No, it’s a personal choice [to wear masks and gloves]. Because we know that this is something to help protect our health” (Female nail technician)

This response highlights the role of personal choice in the salon and how masks and gloves were typically associated with protection and precaution. Furthermore, it highlights both their carefulness and efforts to protect their health and safety. In recognition of the exposure to chemical materials, a few respondents expressed the need to “be careful” (typically said in English) and prevent health harms. This precautionary attitude or hyper-awareness of protecting personal health was also perceived to limit the hazards of chemical exposure:

“We have to protect ourselves as much as we can, and the ability for the chemicals to affect us will decrease” (Female nail technician)

Second, interviewees placed a high premium on hygiene and cleanliness within the salon space and expressed that PPE or cleaning the salon was an important to maintain standards hygiene for themselves, clients, and the overall salon. Third, interviewees justified their use of PPE or utilization of health and safety practices through, what I refer to as, a ‘for us, for them’ mentality. Throughout interviews, ‘for us, for them’ appeared as a catchphrase that suggested an implicit, mutual agreement between workers and their clients to protect one

another's health. For example, when asked whether clients were comfortable with workers wearing masks and gloves, respondents typically expressed some version of:

“Well, they see [the masks and gloves] as a good thing. Because we are also protecting their health, at the same time. We are protecting ourselves, and protecting them too” (Female nail technician)

Also, when asked why respondents utilized liners to ensure hygiene, one respondent stated:

“We always use liners because its salon practice, but the customers like the liner. It's clean for us and clean for them” (Female nail technician)

These responses demonstrate how respondents viewed PPE as providing dual protection for themselves and their clients from adverse harm in the salon and between the two while engaging in salon work. Although the latter quote suggests that they utilize liners because of salon policy, the note about customer preference for liner suggests that client perspectives affirmed the ‘for us, for them’ mentality that helped inform their engagement with health and safety practices.

Lastly, another aspect of personal behavior that was assessed was whether respondents discussed their health with coworkers. However, responses were mixed. A third responded they had discussed their health with coworkers. Of those that discussed their health sometimes or never, they expressed that as some health effects were natural, there was no need to discuss them. Furthermore, respondents did not suggest that discussing personal health was a way to build knowledge of health harms or toxic products, as health was not a topic of conversation that was brought up deliberately between workers, but more randomly. Overall, several aspects of personal behavior, particularly the ways they formed knowledge and utilized PPE, appeared to influence the attitudes of nail salon workers toward health concerns.

Salon Management and Environment

Salon management appeared to play a significant role in implementing and monitoring certain health and safety procedures. Health and safety practices were identified through the criteria for King County's Healthy Nail Salon recognition program and include

use of PPE (masks and gloves), types of ventilation systems, use of toxic-free products, safe chemical handling practices, and hygiene and cleaning procedures (see Table 5).

Table 5. Salon health and safety practices (N=15).

Health and safety practice in the salon	N	%
Masks	13	87
Gloves	13	87
Ventilation	10	67
Central ventilation	8	53
Local exhaust	2	13
Opening doors to ventilate salon space	7	47
Safer products (i.e. toxic-free brands such as Essie and OPI)	8	53
Safe handling of chemical materials (i.e. storage of nail products in closed and sealed containers, decanting products from larger bottles to smaller bottles)	12	80
Keeping salon tidy and clean (i.e. taking trash out daily, sterilizing tools, wiping down foot basin)	9	60

Most interviewees reported that their salons required and/ or encouraged technicians to wear masks and gloves when servicing clients (N=13). All participants stated that their salons had some sort of ventilation system, and typically referred to their central ventilation systems. In describing the centralized ventilation system, respondents either noted that there was a large vent running through the salon pulling fumes outside the salon or that the building manager (many of the salons were located within strip malls or shopping centers) had installed a ventilation system prior to salon operation. Depending on the age of the salon (i.e. whether it was built before or after 2007), respondents noted the presence of local exhaust ventilation, typically a fan on the table or exhaust pipe attached to a table. When asked about local exhaust ventilation, many respondents enthusiastically reported that their salon had local exhaust systems; however, only one out of the three salons I personally visited and observed had a functioning local exhaust system. Some technicians reported using safer or toxic-free products; the example of safe products provided by the researcher were OPI and Essie, which offer nail polishes without the ‘toxic trio’ chemicals (N=8). However, when asked about safer products, participants did not offer specific examples of such products; rather, they simply agreed with the examples I offered.

Additionally, as part of salon health and safety procedures, respondents participated in some safe chemical handling procedures. For instance, all interviewees reported that they decanted refillable liquid products, such as acetone or nail polish remover and thinners, from larger bottles to smaller bottles at each workstation, to prevent against dangerous spills. Given that these products were perceived as dangerous or harmful to health, respondents noted that decanting liquids into smaller bottles made it easier to handle and prevent against spillage. One respondent expressed how dangerous “polish thinner” was:

“One day I dropped the polish thinner, and all the cup is empty. The bottom fell out, the water fell out. Really quickly – more than bleach – it looked like acid. Really scary...” (Female nail technician)

By suggesting that polish thinner was so corrosive it ruined the bottle, this response highlights the importance of taking safety measures to prevent spillage. In addition to decanting, respondents emphasized the practice of tightly sealing products in containers as a further precautionary measure to prevent leaks and release of harmful fumes.

Salon management reinforced that cleanliness and tidiness of the salon were top priorities; as one participant notes, from the time they enter the salon till when they leave, most employees are “always cleaning”. Hygiene practices included sterilizing equipment, throwing away trash and chemical waste at the end of each business day, sanitizing the foot basin, and general tidiness and housekeeping within the salon. All but one participant reported using liners in the foot basin, and several stated that liners were replaced between every client. Only one participant, an owner, noted her salon did not use liners, as their chairs were an older model that did not work with liners; however, her employees thoroughly cleaned each basin in between clients. Most owners and technicians believed that liners were more hygienic, likely due to their single-use nature, and remarked that clients appeared to favor the use of liners more. While most participants argued that single-use products, such as liners or PPE, were standard industry practices and preferred, one participant who worked in a large salon chain described how employees went beyond this standard and were required to use single-use manicures and pedicure kits.

In salon spaces, owner priorities and relationships with staff appeared to shape the salon environment and, thus, understanding of environmental health concerns. Most of the

respondents reported that the salon owner typically worked alongside them; of those that regularly worked alongside their manager, they stated that owners typically helped them out around the salon and were generally “okay” to work with. Furthermore, a majority of interviewees reported feeling “moderately comfortable” or “comfortable” when speaking to their management about their health or issues, management style, hours, wages, and other concerns related to workplace conditions or environment. One interviewee specifically stated that, whenever they had a concern about a certain product or the salon environment, the owner was quick to fix the problem. This suggests that owners and clients generally held good rapport and owners appeared to be considerate of respondent’s concerns. However, when probed about their relationship with the owner, technicians rarely elaborated beyond feeling “comfortable” with their owner.

In addition, participants acknowledged that owners also played some role in educating their workers on health and safety practices and concerns and ensuring they engaged in some protective measures. One responsibility that fell to the owners was changing and maintaining the ventilation system. Although owners did not mention that they had responsibility to change ventilation filters, many technicians expressed a lack of understanding regarding ventilation systems and insisted that owners were more knowledgeable about filtration and ventilation systems and, thus, more responsible. Second, respondents suggested that owners reminded them to utilize health and safety procedures.

“There are new employees who, when they go to throw out the trash, they will throw out the [in English] ‘acetone’ [in Vietnamese] without putting it in a container first. If the owner sees it, they will ask ‘who did this?’ and remind employees not to do that” (Female nail technician)

Despite some oversight over the implementation of health and safety procedures and responsibility to improve the salon environment, only a few owners were reported to have informed technicians of safety hazards. Although a third of participants reported that their owner or management had informed them of safety hazards at work, most respondents stated their owners never informed them of such hazards. Respondents, instead, were adamant that such information was more so gleaned through personal experience; therefore, even if the owner did not inform them, they naturally found out themselves by performing nail work and

interacting with products. This suggests that owners and their oversight over health and safety procedures may be limited in shaping attitudes toward environmental-health concerns in salons, and rather, personal experience could play a more significant role. Another example was the lack of owner responsibility to purchase PPE. Although technicians noted that owners urged them to wear PPE, no technicians reported that their owners purchased PPE for them. Only one owner (whose technicians did not participate in this study) reported purchasing PPE and was adamant about their responsibility to provide PPE. However, technicians did not fault their owners; instead, they expressed that they preferred to purchase their own PPE to ensure their access to high-quality masks and gloves. One respondent was particularly adamant that they chose to bring in their own supplies to ensure use of high-quality products and prevent against health harms:

“Make sure you write that the owner does not buy the gloves for us, but I want to buy my own. Make it clear. Because the gloves that I buy are higher quality – I am scared that they will rip or have holes and the products will get in” (Female nail technician).

In regard to the salon environment, air quality and ventilation was a notable point of interest for participants. Air quality was mostly rated as “normal”, meaning acceptable or fair, with few rating their salon air quality as “excellent”. When asked to elaborate on their “excellent” rating, this respondent explained that the salon did not have fumes. Only one participant adamantly rated their salon’s air quality as “terrible”. Regardless of their ratings, most respondents expressed that maintaining good air quality was important. When asked why they view good air quality as important, one owner responded:

“Yes, because that affects us... when the customers smell the fresher air they feel more comfortable. But the most important – because we are the people smelling it all day – then we are the most important people in this case. That’s why we need to maintain good air quality” (Female nail salon owner)

This response is indicative of other respondent’s perceptions of desire to maintain good air quality to protect their health. However, among most participants, there was a desire to improve air quality, particularly through alleviating the harsh smell of chemicals or by improving ventilation, to make them feel more comfortable about their salon environment. As one respondent explained:

“It’s like if you lived in a really small house and you close both your doors, the front and back doors, and the fumes from acetone and other chemicals will just sit in the room and not escape. And, sometimes, the air conditioner is broken. So, it get’s really uncomfortable” (Male nail technician)

By using the metaphor of closing doors, this respondent illustrates the discomfort of working in a salon with strong odors – it appears suffocating. This respondent appears to suggest that, in addition to central ventilation systems, cross-ventilation through opening doors is important to improving air quality.

Participants were overall eager and enthusiastic to share the various procedures they participated in, particularly PPE, because they felt such practices were either “effective” in protecting their health (N=10) or “highly effective” (N=4). Specifically, several participants noted that these practices limited exposure to chemical and toxics. One respondent explained:

“My salon is really careful with stuff like this [chemical usage and handling]; I really like it. My salon is the best at these practices – there isn’t any smell. There are 17 tables, and you don’t smell anything” (Female nail technician)

It should be noted that this respondent expresses satisfaction with health and safety products because such practices mitigate odors in the salon, thus reiterating how respondents understood smell as an indicator of health harm and a lack of smell is the absence of health harm.

Participants also discussed these practices in the context of their desire to both protect their health and ensure a clean and safe environment. Most expressed that they had never observed or experience issues regarding health, safety, or cleanliness within their salon because they consistently engaged in health and safety practices. Therefore, these responses suggest that salon management and oversight helped to maintain a clean and healthy environment and reinforced personal behaviors regarding health and safety procedures rather than initiate such practices. Respondents acknowledged that, while engaging in these health and safety practices was part of their responsibility as an employee, their desire to consistently practice such procedures was more so tied to a broader responsibility of protecting personal health as nail salon workers. This further suggests that aspects of

personal behavior – particularly choice to utilize PPE or health and safety procedures – was significant in determining attitudes and actions toward environmental-health harms and that salon management serves to reinforce such personal behaviors.

External Factors

I anticipated several factors considered external to the salon environment to be influential in shaping the participant’s attitudes toward environmental health concerns, including the role of external agencies (including the Washington State Department of Licensing, referred to as the “State Board” by respondents, and the Occupational Health and Safety Administration (OSHA)), and client perspectives.

When asked whether they were aware of the Washington State Department of Licensing (referred to as ‘State Board’) policy that salons established after 2007 were required to have local exhaust ventilation, all but one participant stated ‘yes’. In contrast, respondents possessed limited knowledge of OSHA policies protecting the health and safety of nail salon workers. Generally, the participants of this study expressed satisfaction with the “State Board’s” efforts to protect the health and safety of nail salon workers and believed routine inspections were effective in promoting salon cleanliness. In discussing whether agency measures – such as the local exhaust policy or conducting routine inspections – were effective in limiting health hazards, several participants argued that the government was responsible for protecting workers and ensuring their ability to work (N= 4). Only one participant, who expressed a high level of concern regarding chemicals in the nail salon, disagreed and stated that OSHA and the State Board were not doing enough to protect worker health. Despite this, most study participants perceived external agencies positively and expressed a desire to adhere to agency policy to ensure clean and safe nail salons.

Additionally, client perspectives were important in reinforcing use of PPE and general concerns over health and safety in nail salons. When asked how comfortable clients were with participants wearing masks and gloves, most participants responded that clients were either “comfortable” or “very comfortable” (N=10). In further probing to assess whether clients had ever requested that participants not wear PPE, interviewees responded that clients found it “normal” for workers to wear PPE and adamantly rejected the notion that clients denied or disliked PPE; in some instances, clients “insisted” and “preferred” that

workers wore PPE during services. Several interviewees were excited and animated when relaying how, sometimes, clients praised them for wearing masks and gloves during services because they were protecting them (the client) as well as the worker (i.e. ‘for us, for them mentality). When discussing this, these respondents commended themselves for receiving customer praise and felt proud their ability to demonstrate good business practice. For these respondents, the customer perspective was alluded to as another primary reason to implement health and safety practices and ensure hygienic services and environment for both the client and worker.

In contrast, client perspectives had less of an impact on the three owners. Two owners remarked that client perspectives did not matter. One owner specified that, while it did not influence their attitude toward environmental-health concerns, client perspectives were important in determining whether they would return for future services. Given concern on how clients affected the state of their business, they expressed a strong willingness to listen to client feedback. Overall, client perspective was a main external factor that affected participants attitudes toward environmental health concerns.

From responses, it appears that nonprofit organizations are not playing a role in raising awareness on environmental-health problems in salons or helping to keep nail salon workers safe in the Greater Seattle area. In summary, while participants expressed positive perceptions of external agencies and experienced positive reactions from clients, the overall brevity of such discussions over external factors indicates that these experiences are not significant in shaping attitudes toward environmental-health concerns.

DISCUSSION

The goal of this study was to assess whether demographic background, personal behavior, health perceptions, salon management, and external factors influenced the attitudes of nail technicians and owners toward environmental health concerns related to nail salon work. Although I initially anticipated demographics, salon management and environment, and external factors to exert greater influences, these variables did not appear as influential as aspects of personal experience and behaviors in shaping participants attitude and perception of environmental-health concerns in the salon. Throughout the semi-structured interviews, respondents consistently discussed how their personal experiences and observations in the salon informed their understanding of health harms and motivated them to engage in certain health and safety procedures. Furthermore, perceptions of health played some role; whereas respondents who reported directly experiencing adverse health impacts from exposure to or use of nail salon product were adamant that nail salon work negatively impacted their health, respondents who did not experience direct impacts denied that nail salon work presented occupational health hazards. In contrast, when discussing salon management and external factors, respondents explained that these variables more so reinforced their personal experiences and observations of environmental-health concerns in the nail salon. Therefore, the information and themes gleaned from the semi-structured interviews suggest that personal behavior and perceptions of health were factors that significantly influenced or explained attitudes toward environmental health concerns.

Personal behavior largely influences attitudes toward environmental-health concerns

For all participants, personal behavior and knowledge appeared to relate to attitudes regarding environmental-health concerns in nail salons. Regardless of the number of years worked in the salon, level of school or training, or if owners informed technicians of health hazards, respondents consistently expressed how their personal experience working in the salon informed their knowledge of health hazards and protective actions. In addition, respondents discussed they would glean knowledge of health harms or safety in nail salons by taking passed down knowledge or shared experiences and adjusting this information to fit their personal experience. In doing so, respondents suggest that personal knowledge and behavior is constantly negotiated and confirmed by each individual experience. This affirms

that personal experience and behavior plays more of a key role in informing individual attitudes than nail salon owner, booklets, or nail salon education. Therefore, it is important that interventions target workers and utilize experiential learning models that both inform workers and cultivate discussion among them.

In assessing these responses, three underlying ‘logics’ appear to guide individual’s behavior and actions: a strong sense of personal responsibility to protect health, a precautionary attitude, and a ‘for us, for them’ mentality. First, in recognition of the potential adverse health effects from long-term exposure to and handling of toxic chemicals, several respondents were adamant that their personal health was their first priority and, therefore, they had a distinct responsibility to care for and maintain their health. This motivated their use of PPE, their desire to clean, and general concern of environmental-health problems. In articulating this sense of personal responsibility, respondents typically stated that their health was something they “knew” they had to protect, indicating an inherent understanding that health was significant and vulnerable.

Additionally, responses suggested that nail salon workers in this study actively chose to protect their health. One of this study’s major findings was that, for most technicians, owners did not purchase masks and gloves. Instead, technicians adamantly chose to purchase PPE for themselves. This affirms how personal choice is significant in determining how women understand, and thereby protect themselves from, experienced and perceived environmental health concerns in salons. In touching on choice, particularly in regards to PPE, respondents suggested that a sense of agency was gained by protecting their health; therefore, for workers who were concerned over their health, the choice to buy higher quality gloves was also an opportunity for them to gain a sense of control over their environment and work.

Of the three owners, only one reported purchasing PPE for their employees. It should be noted that this owner had the ‘healthiest’ salon observed in this study (i.e. salon most invested in and knowledgeable of health and safety practices) and this owner was knowledgeable and dedicated to utilizing updated technology, research, and protecting employee health. Thus, this suggests that owners possess some responsibility to protect their workers but may lack equipment, resources, or willingness.

Second, in conjunction with a sense of responsibility to protect health, respondents exercised a precautionary attitude because they believed prevention was paramount to protecting their health, limit hazards from chemical exposure, and prevent adverse health effects in the future. Furthermore, this preventative attitude was seen as beneficial in the long run:

“We are trying to work for a long time, so we need to prevent rather than cure”
(Female nail technician)

This finding aligns with Harris-Roberts et al. (2011) who found that technicians were also using PPE, ventilation systems, and placing lids on items to prevent harm while using potentially hazardous liquid and powder products. Thus, this precautionary attitude also motivated workers to engage in health and safety practices and protect their health.

Lastly, respondents articulated their understanding of health through a ‘for us, for them’ mentality. Within a discussion of this mentality, this study finds that customers praised and encouraged workers for wearing masks and gloves because PPE ensured a hygienic exchange of services and protected both the workers and them from chemical exposure and perceived health harms. In contrast, a New York-based study found that clients rejected PPE because it made them feel uncomfortable (Kang, 2010). Furthermore, nail salon workers in Florida rarely wore protective items during services because they believed it limited their abilities to communicate with clients, thus preventing them from establishing a stream of regular customers and receiving more tips (Ho et al., 2007).

The ‘for us, for them’ mentality was powerful among respondents because it aligned worker and client interests of health, thus reaffirming worker’s understanding that personal health was important, their efforts to protect personal health, and their desire to ensure a clean, safe salon environment. Furthermore, ‘for us, for them’ was a way for respondents to articulate the double benefits of using PPE and other health and safety practices; because these practices presented benefits for two parties, it was surely a positive thing to utilize PPE and protect health. This suggests that the ‘for us, for them’ mentality helped to shape respondent’s belief in the effectiveness of health and safety procedures and, thereby, prompted their utilization of such practices. This mentality also illustrates the role that client perspectives play in affirming the actions of workers and potentially highlights some

opportunities in leveraging the unique worker-client relationship to improve health and safety in nail salons.

As a whole, an exploration of the underlying ‘logics’ for personal behavioral practices offers insight into what motivates workers to take care of their health, their perception of health risk, and the actions they take to protect against and mitigate health harms. This exploration highlights the importance of personal experience in self-informing nail salon workers and suggests that the language of intervention should focus on these aspects of responsibility, carefulness, and ‘for us, for them’. Overall, personal behavioral practices, motivated by ‘logics’ of responsibility, precaution, and a reciprocal agreement to protect worker and client health, greatly influenced participants attitudes toward environmental-health harms in the salon.

Although a majority of respondents did not report feeling any changes to their health since working in the salon and a majority reported their health as ‘normal’, respondents articulated health concerns through discussions of the value of PPE, desire to protect health, and worries over air quality.

In the salons surveyed, established health and safety practices, particularly PPE and storage and disposal of chemical materials, was perceived as important to protecting worker health and highly effective at creating better and more comfortable work environments. While this study reports that nearly all technicians reported wearing masks and gloves, except for specific services requiring skin-on-skin contact, previous studies observed a lack of PPE usage within salons located in Eastern parts of the United States. In New Jersey, 41% of technicians surveyed reported wearing masks all the time and 15% of technicians never wore gloves (Shendell et al., 2017). Furthermore, despite a New York City law requiring workers to wear nitrile gloves during services and owners to provide appropriate gloves for technicians, in many salons surveyed, workers did not wear gloves while performing various services (Basch et al., 2016). This suggests that policies regulating the use of PPE may be inadequate and could provide evidence that behavioral factors may play a stronger role in motivating workers to utilize PPE.

Therefore, while the higher rates of PPE usage observed in this study could be attributed to the small sample size, the prioritization of personal health and responsibility to

protect individual health observed in this study population could also help to explain higher rates of observed PPE use. As one respondent illustrates:

“I wear the gloves and masks because I know that is something I must do to protect my health” (Female nail technician)

Additionally, a 2015 *Seattle Times* article surveying labor conditions of nail salon workers in Seattle reported that technicians are thoroughly trained on product usage and that technicians wear masks and gloves all the time (Acuna, 2015). Therefore, in reiterating the process of building knowledge and sharing knowledge within the salon space, this could point to a tradition in Seattle nail salons to prioritize protecting health and, thereby, utilize PPE more.

A study of Korean nail salon workers in New York found that participants were avoidant of and reluctant to use PPE because they believed it did not provide full protection against harm (Seo et al., 2019a). Although this study’s respondents were not questioned on the extent of harm that was avoided by using PPE, in combination with a consistent narrative that current health and safety practices adequately protected their health, it follows that respondents perceived PPE as providing enough protection against such anticipated harms – so much so, PPE was the primary and preferred method of protection against environmental-health concerns. Overall, this study departs from previous literature that reports low PPE among nail salon workers and presents new findings that higher willingness to utilize PPE in this study population could be attributed to stronger emphasis on protecting personal health through adherence to established chemical handling and disposal practices, belief in the ability of PPE to protect against perceived environmental-health harm, and perceived ability to exercise agency in protecting one’s health. This study also points out significant differences in PPE use and client perspectives regarding PPE in salons located in Eastern parts of the United States. This could suggest that client-worker dynamic or attitudes toward personal health vary by region, and thus, influence regional PPE usage.

A survey of nail salon workers in Alameda County found that at least 80% of participants reported observing health effects or differences after beginning work in the nail salon industry (Quach et al., 2008). Furthermore, another study in New York found that 75% of Asian immigrant nail salon workers expressed health-related concerns in the workplace

(Seo et al., 2019b). In contrast, this study's participants were split on whether they personally observed or directly experienced health impacts from toxics product exposure and whether they experienced changes to their personal health after beginning salon work.

Despite the limited experience with adverse health impacts within this study population, the self-reported health effects (mainly skin and respiratory irritation and musculoskeletal stress) were consistent with the literature. Nail salon workers were found to experience an increased prevalence of work-related musculoskeletal disorders, particularly in the neck, shoulder, wrist, hand, and lower back due to the awkward posture of workers while conducting services (Acuna, 2015; Harris-Roberts et al., 2011). Additionally, nail salon workers in Boston, California, New Jersey, and Oregon experienced similar respiratory and skin irritation, with irritation to the eyes, nose, throat, and lungs being particularly prevalent (Ma et al., 2019; Pavilonis et al., 2018; Shendell et al., 2017; White et al., 2015). Although such health effects were not as commonly reported within this study sample, as illustrated by the respondent who reported experiencing severe or long-lasting bloody noses from acetone inhalation, respiratory irritation may impede work and comfortability. The severe health effect felt by this respondent from exposure to harsh solvents demonstrates the need to reduce source exposure to prevent further health disparities.

In addition, regardless of whether they reported health impacts or were adamant about the connection between health issues and their occupation, respondents still exhibited a strong desire to protect against potential health impacts and maintain their overall health. The desire and emphasis on protecting health makes sense given that nail salon workers are vulnerable to exposure from toxic chemicals through three routes: inhalation, ingestion, and skin absorption (UCLA Labor Center, 2017). Furthermore, an Oregon-based study found that most respondents believed nail salon work could be associated with long-term health consequences, including neurological and reproductive health problems (White et al., 2015). In this study, one of the respondents who expressed a desire to leave noted experiencing differences in their health while working in a nail salon and while taking breaks from nail salon work; a Boston-based study also reported workers observed notable health differences after stepping away from nail salon work, thus validating this finding (Gorman and O'Connor, 2007). Therefore, these studies confirm the severe concerns expressed by

respondents who observed differences in their health while working in nail salons and suggest that nail salon work can be related to adverse health impacts.

Additionally, respondents who expressed a desire to leave implied that (a) nail salon work was damaging to their health and (b) if they had greater economic mobility, and thereby choice, they would choose to work in a healthier industry and environment. This touches on questions of environmental and economic justice for this predominantly immigrant workforce. Even though nail salon work presents financial stability for Vietnamese immigrants more broadly, the experiences reported on in this study suggest that nail salon workers may still feel restricted in their choice to pursue nail salon work due to their economic positioning as immigrants, limited English proficiency and education, and perceived lack of other job opportunities. This could also suggest that those of lower economic status or possessing fewer financial resources may be pushed into working in more toxic or unhealthy work environments (Hu et al., 2011). Therefore, in addressing nail salon health, it is important for policy-makers and advocates to utilize an environmental justice framework to address this intersectional issue and assess whether limited economic prospects push Vietnamese immigrant women toward nail salon work. Overall, despite the limited findings regarding health, this study finds that several workers still experienced some adverse health impact from nail salon work, mainly skin and respiratory irritation, and that respondents still emphasized the need to protect their personal health.

The role of smell in identifying toxic products, measuring health harm, and determining air quality and quality of salon services

In this study, respondents articulated an understanding of poor air quality, product toxicity, and chemical exposure through their sense of smell. Smell was a tactic for respondents to both identify several highly toxic and harmful products and gauge their level of hazard or health risk. Therefore, through smell, respondents could identify the level of protective measures they should take to reduce harm. In addition, when discussing respiratory irritation due to toxic exposure, respondents described the process as ‘breathing in the smell’ and then feeling respiratory distress, rather than breathing in the product itself. This small difference, and the use of ‘smell’, highlight a unique and interesting way that nail salon workers may be understanding health impacts and product safety. Respondents also utilized their perception of smell to determine safe working environments and judge a salon’s

services, which suggests their sense of “smell” helped them to navigate potentially unhealthy or unsafe workspaces and, thus, protect their health.

Additionally, this study reports that several respondents believed a lack of smell indicated that a salon had good air quality and was cleanly, hygienic, and offered better services. Respondents believed that ventilation systems helped to limit smell and, thereby, mitigated potential for environmental-health problems and improve air quality. For instance, one respondent in this study noted that, with a ventilation system, the smell of acetone immediately disappeared, and from their perspective, indoor air quality was improved, and the threat of acetone was severely diminished. Furthermore, respondents believed adequate ventilation was important to making them feel comfortable in their working conditions. As the UCLA Labor Center (2018) reports, salon ventilation is key to worker protection and to ensuring a healthy and safe environment; particularly, ventilation systems should have multiple entry and exit points in order to be effective (Quach et al., 2008). Additionally, a New York-based study found some improvements to salon indoor air quality related to general exhaust ventilation (Pavilonis et al., 2018).

Despite this praise for ventilation systems and reports that most respondents had general or local exhaust ventilation systems in their workplace, only two out of three observed salons had obvious ventilation systems or were using ventilation systems. This finding is similar to a New Jersey study in which 91% of participants reported a central ventilation system and 45% reported having a table fan, but observations found this to be false (Shendell et al., 2017). Therefore, this study reiterates the need to increase the use of ventilation systems throughout salons to improve indoor air quality, reduce smell, and increase worker comfortability.

One respondent questioned the ability for ventilation systems to reduce smell and improve air quality. This respondent implied that technicians should take more proactive measures – such as the personal, individual action of opening a door – to reduce smell and, thus, improve their air quality. In addition to pointing out a sense of agency that nail salon workers have to improving the salon environment, this response also highlights the need for more research to assess whether (a) a lack of odor in a salon was correlated with a decrease in volatile organic chemicals and (b) the extent to which ventilation systems decrease volatile

organic chemicals. While this population utilizes smell to assess product toxicity, air quality, and a salon's working conditions, smell can be inaccurate or limited in measuring potential health harm or chemical exposure. Nail salon products contain volatile organic compounds that form nail coatings, artificial nails, cleaners, adhesives, and coating removers (Pavilonis et al., 2018). Given the abundance of volatile chemicals in nail salon products, there is a possibility that several products or materials are toxic but not odorous. Furthermore, one owner remarked that they were unbothered by chemical smell, and thus perceived a lack of health harm, due to their long-term use of and exposure to nail salon products. This suggests a potential desensitization to smell; therefore, more needs to be explored regarding the use of smell as an accurate predictor of harm.

Overall, this study highlights the unique way that nail salon workers use 'smell' to articulate their perception of health harm, navigate the salon environment, decide what proactive measures to take to protect their personal health, and both determine air quality and argue for the need to improve air quality. This discussion also suggests that this population understood how to discuss salon-related issues through 'smell', such as 'volatile organic chemicals' and air quality. Therefore, this finding suggests that regulators or advocacy groups – or other forms of intervention – should utilize the language of 'smell' as a way to discuss toxicity, poor air quality, or other health impacts. In general, more attention should be paid to the language used in different policy or community-based interventions to ensure that nail salon workers understand both the harms they are exposed to as well as the different actions they can take to alleviate such harms.

This study also reports that although most respondents acknowledged that chemical products in salons were toxic, several respondents (N=5) reported a lack of concern over health impacts related to salon work, citing non-occupational health determinants (i.e. age), reliable access to health care, the effectiveness of health and safety practices and technological advancements, and a normalization of health concerns. However, a deeper behavioral analysis demonstrates complexities behind these reasons. For one, the three owners argued that health concerns were few or non-existent because current health and safety practices, mainly PPE and chemical safety and handling, were already adequate in protecting themselves and their staff. One owner reiterated that their salon engaged in strict

safety practices, including tightly closing all liquid products and using liners. This owner expressed that:

“I just do as much as I can to protect our [employee’s health]” (Female salon owner)

This response is one instance of an owner explicitly acknowledging a responsibility to protect employee health. In addition, this response suggests that the owner’s best efforts to promote health and safety are enough to quell concerns related to environmental-health impacts. Furthermore, it re-affirms nail salon workers belief in the effectiveness of current health and safety practices in protecting them from and eliminating harm.

Another owner adamantly refuted that nail products and exposure presented risk to health because industry technology and product manufacturing has improved over the years to reduce toxicity and adverse health effects. Therefore, to this owner, health harms from nail salon products were a misconception among nail salon workers and others who failed to acknowledge that technology adapts to minimize harms. This re-affirms a consistent mindset across several respondents that it was in the best interest of external actors, including product manufacturers and agencies, to prevent health harms to exposed populations. However, this respondent suggested their American education and ability to speak English placed them at an advantage to research and understand product safety information and industry innovation, as compared to the immigrant nail salon owners who stated that they understood salon management and health and safety through the certification class and personal experiences. Therefore, these differences in education should be taken into consideration when assessing why nail salon owners choose to purchase and utilize newer technologies that improved salon health and safety.

Respondents who (a) believed they were of ‘normal’ or ‘average’ health and (b) reported not experiencing health changes since working in the salon suggested that adverse health symptoms– including musculoskeletal pain or headaches – were normal issues and related to other non-occupational health determinants, such as aging. In describing such health symptoms as ‘normal’, these respondents normalized and minimized health effects and concerns in the workplace. For instance, one respondent stated they were not worried about experiencing musculoskeletal pain or other adverse health effects from nail salon work due to their access to healthcare. As Asian immigrant women tend to delay or underutilize

professional healthcare services, this experience could suggest that access to routine and reliable healthcare could improve worker anxiety or change their perception of health-related concerns from nail salon work (Seo et al., 2019b). Thus, while this minimization of health concerns could be dangerous to their health, in this instance, it points out a potential opportunity for progress in promoting worker health and safety.

Additionally, respondents who denied links between their occupation and health hazards suggested that worrying over health was as unproductive and unhelpful, as it did not improve their personal health situation or the salon environment. One respondent outlined this logic:

“We know the dangers, there’s no question about it. For example, we know all of the products are toxic, but we just have to work. How else will we make money? If I don’t work, how will I pay for food, have money to spend, pay my bills? You understand? I didn’t have the chance to go to school, so there was no way I could obtain a high[er] position” (Female nail technician)

This response outlines how worrying over health or exposure to toxic products did not improve their personal health, better the salon environment, decrease product toxicity, or change the fact that there were serious repercussions if they let their concern for health override their need to support their families. Therefore, it was better to minimize or normalize health concerns than to act upon them.

However, regardless of whether participants exhibited concern over environmental-health disparities or recognized that salon products were toxic chemicals, every respondent still took measures to protect their health (i.e. utilization of health and safety procedures and PPE) because they recognized the importance of protecting personal health. This highlights how, in this study sample, protecting personal health is a strong motivator for utilizing protective services and motivating attitudes toward environmental-health concerns. Thus, a lack of concern over the potential health impacts is not a failure to protect one’s health or denial of health disparities; rather, this ‘normalization’ could be a coping technique that allows nail salon workers to pursue this work long-term and navigate a landscape that is more vulnerable and exposed to toxic, volatile chemicals. Furthermore, this result

demonstrates how the desire to protect personal health is a strong motivator in this community of nail salon workers and owners. Therefore, in understanding attitudes and perceptions of environmental-health concerns, it is important to recognize that high and low levels of concern do not affect utilization of and participation in practices to improve health and safety in the nail salon and protect personal health. Additionally, this study highlights the value of connecting to this population through discussions of protecting personal health, rather than discussions of direct impact or long-term exposure to hazardous chemicals.

Limitation of findings

This study anticipated that demographic qualities (i.e. age, education, English proficiency, years worked in the salon, gender), salon management and environment, and external factors would play a larger role in influencing attitudes toward health; however, results did not support these hypotheses. For one, it is difficult to determine the effect of demographic variables given the study's small sample size.

Second, although the small sample size of owners (N=3) prevented generalizations on their role in the salon space, the data suggested that, in the salons surveyed, owners were playing a limited role in shaping attitudes toward environmental health. Many technicians surveyed noted that their owners had not taken steps to inform them of health and safety concerns in the salon; however, these respondents expressed that, even without owner intervention or knowledge-sharing, they would have eventually understood the harmful effects of toxic chemical exposures. Owners were also split on their perception of harm in the salon space, their level of responsibility to promote certain health and safety practices, and willingness to invest in better health and safety practices or technologies, including ventilation or safer products. The case of the American-educated owner who purchased PPE and felt comfortable investing in central and local exhaust could suggest a need to better inform and equip owners with the ability to invest in and run healthier nail salons.

Lastly, I predicted that regulatory agencies would play a larger role in informing and shaping attitudes toward environmental-health concerns through their inspection process and dissemination of training or product safety information; however, although one owner stated their adherence to health and safety regulation stemmed from a fear of legal repercussions for non-compliance, most owners and workers did not connect their knowledge of health and

safety concerns to regulatory agencies. Instead, participants noted that the inspection process and presence of an agency demonstrated their ability and expertise in taking care of their health and safety. Furthermore, participants expressed positive attitudes toward external regulatory agencies and belief that external agencies adequately protect worker's health contrasts Quach et al (2011) earlier finding that Vietnamese women in California nail salons largely distrusted agencies due to their history of penalizing salons for health and safety infractions and practices.

Limitations

This study experienced several limitations. Only 15 technicians and owners were interviewed across ten salons for the study; therefore, the ability to determine the significance of results, identify correlations between different responses and variables, and come to substantial conclusions was limited. In addition, as interviews were primarily conducted in Vietnamese by a native, but novice, speaker, some responses could have slight errors in translation that either muddled or obscured the respondent's intended meanings. In conducting interviews, this study was also limited in personal observations of salon spaces, thus was limited in verifying interview responses regarding health and safety practices, specifically with ventilation systems. Lastly, this study could not definitively establish a causal relationship between the assessed variables and outcomes on personal attitudes toward environmental-health concerns, nor could this study establish causality between workplace chemical exposure and work-related health symptoms. However, causality was not a focus of this study. Thus, despite these limitations, this study fulfills its initial intention to provide a unique qualitative and behavioral analysis of the different components and factors of nail salon work that could influence attitudes, as well as provide insight into the underlying motivations or experiences that inform the measures nail salon workers take to increase their understanding of or to protect their health.

RECOMMENDATIONS AND FUTURE INTERVENTIONS

This study highlights the complex interactions between different variables and behavioral qualities in shaping nail salon worker's perceptions of environmental-health harm in the salon. Combined with the exposure to hazardous chemicals, lagging regulatory

standards and enforcement, and a large immigrant workforce facing cultural, linguistic, and economic barriers, there is a clear need for interventions that both minimize chemical exposures in this vulnerable workers population and drive progress toward healthier and safer nail salons (Quach et al., 2018). Discussions of air quality and health concerns highlights that future interventions should focus on improving ventilation systems to reduce health impacts from poor indoor air quality. As one respondent states:

“(in English) I think the only thing is that every salon needs to be cleaner and have fresher air. And the chemicals...someone makes it [the products] so it needs to be better and more healthier for everyone” (Female nail technician)

This response illustrates that nail technicians care for better salon environment, improved air quality, and safer chemicals. While this could come from changes in the external regulatory environment or from product manufacturers itself, another respondent clues in on an important factor:

“The [product manufacturing] company – they know it. So they know what to do to make it healthier for everyone. They just sell it; they don’t care for us. We are the one that has to deal with that smell everyday” (Female nail technician)

While this response condemns product manufacturers for their lack of consideration for nail salon workers and suggests that the chemical industry has a responsibility and the capacity to create safer chemicals, by clearly identifying nail salon workers as the party experiencing such harms every day, this respondent indicates that change should concentrate on the needs and considerations of nail salon workers. As this study reveals, nail salon workers both recognize and prioritize personal health above other matters and such an emphasis on health both informs and drives personal behaviors, and thereby attitudes, regarding environmental-health concerns in the salon. The importance of personal behavior reveals and suggests that interventions should focus on changing personal behaviors through discussions of personal health, such as developing individual and collective strategies centered on improving and protecting health, and, most importantly, center on workers and owners.

In utilizing a frame of personal health to discuss issues of toxic chemical exposure and nail salon health, interventions may allow both workers and owners to exercise more agency. Rather than focusing on factors that they may be unable to change, such as the lack of legal protections, customer influence, product manufacturing, a focus on personal health could allow nail salon workers and owners to assess what they are able to change and engage in personal decision-making and choice to best act on such changes. Thus, this study reaffirms and supports utilizing participatory intervention strategies that seek to involve both the worker and owner (Huynh et al., 2019; Quach et al., 2008; Quach et al., 2013).

Previous strategies have mainly focused on using incentive-based systems, like healthy nails salon recognition programs. In applying a certification scheme for ‘healthier’ and ‘safer’ salons, this intervention strategy attempts to persuade salons to use safer products, install ventilation, and utilize PPE (Porter, 2009). Additionally, previous interventions have promoted multi-stakeholder approaches that involved community groups and/ or non-profits and regulators to induce policy-based changes (Quach et al., 2015; UCLA Labor Center, 2018). However, not all respondents in this study were concerned with regulators and believed agencies were fulfilling their responsibility to protect worker health; plus, respondents did not express desire to interact with non-profits. Thus, this study suggests a new framing for interventions that target behavioral changes toward health.

Specifically, this study provides support for owner and worker-based trainings to improve knowledge of workplace chemical exposures and promote behaviors that mitigate exposure (Quach et al., 2013; Quach et al., 2018) or increase awareness of personal health and safety (Harris-Roberts et al., 2016). The California Healthy Nail Salon Collaborative, a leading organization advocating for better protections of worker health and safer and healthier salons, has both designed and implemented programs that seek to provide information and training for Vietnamese immigrant nail salon employees (Healthy Nail Salon Program, 2019; Switalski, 2016). In addition, programs that utilized owner-worker trainings, in which owners are first educated in occupational health problems and health and safety procedures in the nail salon space before going on to inform and train their workers, increased best practices, including safer products, and improvements to worker knowledge about the ‘toxic trio’, chemical handling, use of toxic-free products (Quach et al., 2013;

Quach et al., 2018). In order to be effective in promoting knowledge and self-reported behaviors to reduce chemical exposures and protect worker health, such training must be culturally and linguistically appropriate (Ma et al., 2019; Quach et al., 2013; Quach et al., 2018). This study supports such training practices and suggests expanding programs to more intently incorporate enhancing health literacy and discussion of personal health to further connect with nail salon workers and owners. Furthermore, this study provides evidence that such trainings should incorporate the specific language that workers and owners are using to understand and articulate their conception of environmental-health concerns, including personal responsibility, ‘for us, for them’, and smell.

In recent years, various Asian American, immigrant rights, public health, and environmental organizations have collaborated and mobilized to upgrade nail salon work (Kang, 2010). However, participants in this study were both confused and unfamiliar regarding non-profit intervention, thus reflecting a lack of specialized non-profit or community advocacy driven efforts to organize around this issue in the Seattle area or a lack of understanding over the roles of non-profits in suburbs outside of Seattle. In contrast to King County, which previously ran ‘Healthy Nail Salons’ a nail salon recognition program that supported ventilation installation and worker health and safety education initiatives, Snohomish County has lacked such programming and non-profit interaction (Healthy Nail Salons, n.d.; White et al., 2015). Therefore, future work in the Greater Seattle area should explore how to revitalize such programs and adapt it to other localities, particularly Snohomish County. Although there is some evidence that nail salon recognition programs could reduce chemical exposures and increase work-related knowledge (Garcia et al., 2015), more work should evaluate whether such programs improve nail salon worker understanding of health harms and facilitate a discussion of strategies to protect personal health for nail salon workers and owners. Regardless, despite some previous instances of distrust of external agencies as explored in several other studies, the positive attitude toward regulatory agencies displayed in this group of study participants demonstrates an opportunity and potential success of a recognition program in the Seattle area (Quach et al., 2010; Quach et al., 2012).

Lastly, owners are important actors that should be targeted as implementors of intervention strategies. While this study did find that the role of owners was limited in

influencing behaviors toward and perceptions of health harm in the salons, more broadly, owners can play a significant role in cultivating healthier nail salons. First, owners have direct control over safe workplace procedures, selection of products, and salon operations, including ventilation systems, and therefore can initiate positive changes at the operational level (Quach et al., 2015; Quach et al., 2018). Second, owners control the information disseminated to workers; given their ability to speak the common language, it follows that owners are equipped to share and communicate health and safety information with workers in accessible and appropriate ways (Quach et al., 2018; UCLA Labor Center, 2018). In nail salons, owners and workers develop unique and complex relationships that mix typical labor relations with ethnic labor relationships that extend beyond financial support and into the realms of community, emotional support, and friendship (Hoang, 2015; Quach et al., 2015; Quach et al., 2018). Given the immigrant background of many Vietnamese nail technicians, it is important to recognize that owners are providing an environment that is culturally comfortable and may be perceived as better than working in a non-Vietnamese setting (Hoang, 2015). Thus, owners possess the necessary cultural and emotional capital to connect with workers and influence attitudes and behaviors. Even though owners were found to have played limited roles in influencing attitudes toward health in this study sample, the single owner who heavily invested in better health and safety technologies and purchased PPE, combined with previous assessments on owner responsibilities in the salon corroborates these arguments that owners should be seen as key actors in increasing worker knowledge, improving behavioral practices, and creating healthier nail salons.

This study provides strong evidence for intervention strategies that improve indoor air quality through installation of proper ventilation systems throughout Seattle-area salons as well as programs that seek to improve knowledge and behavioral practices of nail salon workers and utilize salon owners as key agents to implement such strategies and build healthier workplaces. Furthermore, this study suggests a new framing of intervention strategies that focuses on a discussion of personal health and responsibility as a proxy for understanding environmental-health hazards and toxic exposure. This study's primary finding that personal experience and behavior is significant in influencing attitudes toward environmental-health disparities both reveals that personal health is important and that nail salon workers are not helpless to their disproportionate vulnerability to this issue. Rather,

they are engaging in unique behaviors that allow them to communicate and build knowledge of environmental-health risks, navigate the salon environment, negotiate health harm, and discover different protective practices. Ultimately, understanding this variable of personal behavior and the value of personal experience indicates that interventions should focus on improving and increasing knowledge and behavior practices, prioritize a language of health, and target owners and workers to develop personal and collective strategies to protect their health and improve salon health.

In summary, by exploring the unique experiences of Vietnamese nail salon workers and owners in the Seattle area, this study highlights the complex environmental-health concerns facing this understudied and underrepresented community and the unique ways in which they confront and navigate occupational, environmental, and personal challenges. In doing so, this work seeks to incorporate and uplift a unique immigrant narrative within environmental justice work and intends to further research regarding both nail salon work in Vietnamese communities and Vietnamese community health more broadly. Overall, this intersectional issue is important in protecting vulnerable immigrant communities and illustrates that, ultimately, “beauty should be synonymous with health and fair working conditions” (Switalski, 2016).

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APPENDIX

INTERVIEW A (Nail Technician)

Participant Number:

Demographics

1. Gender
 - a. Male
 - b. Female
 - c. Not listed: _____
2. Age
3. Years lived in the U.S.
4. Family size (household)
5. Education level
 - a. Some high school
 - b. High school
 - c. Some college
 - d. College
6. English proficiency
 - a. Poor
 - b. average/ fair
 - c. Good
 - d. Excellent
7. Prior to this, what was your job occupation?
8. How many years have you been working as a nail technician?

Health

9. Have you noticed changes in your health since you started working in the nail salon?
 - a. Yes
 - b. No (definitive)
10. Perceived health status
 - a. Poor
 - b. Fair (average)
 - c. Well
 - d. Extremely well
11. Are you concerned about your health or the health effects from working in a salon?
 - a. Not concerned at all
 - b. Sometimes concerned
 - c. Concerned
 - d. Very concerned

Personal Behavior

12. Are you aware of toxic chemicals in nail products? How did you become informed of toxic chemicals in nail products?
13. Have you ever read the safety information on the products?
 - a. Yes
 - b. No
14. Do you discuss your health with your co-workers?
 - a. Yes
 - b. Sometimes
 - c. No
15. How often do you wear a mask or gloves when working with a customer?
 - a. Never
 - b. Most of the time
 - c. All of the time
16. Do you take breaks? When you take breaks, do you go outside or do you stay inside the break room?
17. How long is your work day?

Salon Environment and Management

18. Which of these safety practices does your salon provide or engage in (mark all that apply)?
 - a. Mask
 - b. Gloves
 - c. Ventilation system
 - d. Open doors to ventilate the space
 - e. Safer products (ex: OPI, Essie, etc.)
 - f. Safe handling of chemical materials (storage of nail care products in closed and sealed containers or decanting nail care products from large bottles to smaller bottles)
 - g. Keep salon tidy and clean (i.e. wipe down foot basin after each use, sterilize equipment, regularly change out filters, throw away trash and chemical products each day)
19. Do you believe these practices are effective in protecting your health?
 - a. No effect
 - b. Moderately
 - c. Effective
 - d. Highly effective

20. How would you rate the air quality in your salon?
- a. Terrible
 - b. Poor or requires improvement
 - c. Acceptable
 - d. Excellent
21. How often does the owner work alongside you?
22. Has your employer informed you of hazards from the chemicals at work?
- a. Yes
 - b. No
23. How comfortable are you speaking to management about your health or issues in the workplace (i.e. management style, hours, pay, workplace conditions)?
- a. Not comfortable
 - b. Moderately comfortable
 - c. Comfortable

External factors

24. How many customers do you have in a day, on average?
25. How comfortable are clients with you wearing a protective mask and/or gloves?
- a. Not comfortable
 - b. Moderately comfortable
 - c. Comfortable
26. Has an outside organization or non-profit (example: ECOSS) approached you or the salon about improving services or health quality?
- a. Yes
 - b. No
27. Do you know that the Washington State Department of Licensing requires ventilation in nail salons?
- a. Yes
 - b. No
 - c. I don't know
28. Is the Washington State Department of Licensing adequately protecting your health and safety through inspections or its policies?
- a. Yes
 - b. No

INTERVIEW B - SALON OWNER OR MANAGEMENT

Participant Number:

Demographics

1. Gender
 - a. Male
 - b. Female
 - c. Not listed: _____
2. Age
3. Years lived in the U.S.
4. Family size
5. Education level
 - a. Some high school
 - b. High school
 - c. Some college
 - d. College
6. English proficiency
 - a. Poor
 - b. average/ fair
 - c. Good
 - d. Excellent
7. Prior to this, what was your job occupation?
8. How many years have you been working as a nail technician?
9. As manager or owner of this salon?

Health

10. Have you noticed changes in your health since you started working in the nail salon?
 - a. Yes
 - b. No
11. Perceived health status
 - a. Poor
 - b. Fair (average)
 - c. Well
 - d. Extremely well
12. Are you concerned about your health or the health effects from working in a salon?
 - a. Not concerned at all
 - b. Sometimes concerned
 - c. Concerned
 - d. Very concerned

Personal Behavior

13. Are you aware of toxic chemicals in nail products? How did you become informed of toxic chemicals in nail products?
14. Do you discuss your health with your co-workers?
 - a. No
 - b. Sometimes
 - c. Yes
15. How often do you wear a mask or gloves when working with a customer?
 - a. Never
 - b. Most of the time
 - c. All of the time
16. How long is your work day?

Salon Environment and Management

17. Have you communicated the health effects of your products or salon environment to workers?
 - a. Yes
 - b. No
18. Which of these safety practices does your salon engage in and/or that you provide (mark all that apply)?
 - a. Mask
 - b. Gloves
 - c. Ventilation system
 - d. Open doors to ventilate the space
 - e. Safe handling of chemical materials (storage of nail care products in closed and sealed containers or decanting nail care products from large bottles to smaller bottles)
 - f. Keep salon tidy and clean (i.e. wipe down foot basin after each use, sterilize equipment, regularly change out filters, throw away trash and chemical products each day)
19. How would you rate the air quality in your salon?
 - a. Terrible
 - b. Poor or requires improvement
 - c. Acceptable
 - d. Excellent
20. How effective do you think these practices are at protecting worker health?
 - a. No effect
 - b. Moderately effective
 - c. Effective
21. Are you willing to spend money on protective practices? How much?

22. Have you established a policy for when employees are sick (i.e. sick day, paid time off, unpaid time off)?
- a. Yes
 - b. No

External Factors

23. How many customers a day come to your salon, on average?
24. Have any outside organization approached you or the salon about improving health and safety practices, or to inform you of health and safety practices?
- a. Yes
 - b. No
25. How comfortable are clients with protective services (masks, gloves, ventilation)? Have any clients complained?
26. How much do customer's perspective or feedback influence salon operations (i.e. the products you use, safety precautions taken, salon set-up)?
27. Did you know the Washington State Department of Licensing requires ventilation systems in all nail salons? If so, did the state or local government give you any money to install ventilation systems?
28. Do you know what the Occupational and Health Safety Administration (OSHA) requirements to protect the health of nail salon workers are? If any, do you feel they are adequate?