



Perceived work exposures and expressed intervention needs among Michigan nail salon workers

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Received: 27 January 2021 / Accepted: 11 April 2021 / Published online: 29 May 2021
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Abstract

Background Nail salon workers are an underserved population exposed to various occupational hazards. Comprised primarily of women and immigrants, these workers face challenges that further increase their workplace exposures and adverse health outcomes. Though previous studies have noted nail salon workers' exposures, these studies have yet to explore the workers' insights on intervention needs. This study among Michigan nail salon workers addresses this gap.

Methods This qualitative study was informed by the phenomenology methodological framework anchored within critical social theory. Participants were recruited from nail salons in Southeast Michigan to partake in focus groups. Interviews were recorded, transcribed, and analyzed using content analysis.

Results Three focus groups were conducted with 13 participants. Three major categories emerged. The first category, workers' perceived work-related stressors, included six themes: lack of standardized policies, regulations, education/training; disconnect between education/training and real-world practice; inadequate knowledge on exposures and safety protocols; unsafe nail products; customer pressure; and immigrant-related pressures. The second category, health issues perceived to be directly related to workplace exposures, included two themes: symptoms experienced due to contact with nail products and symptoms due to poor ergonomics. The third category, participants' perceived intervention needs, included four themes: continuing education; updates with new products; communication with key stakeholders; and partnership building and resource access.

Conclusions To our knowledge, this is the first qualitative study among U.S. nail salon workers focused in Midwest. In addition to the noted individual and organizational-level interventions, policy level implications are discussed given discrepancies in training and practices across states.

Keywords Community-based research · Exposure · Focus groups · Occupational health · Nail salons

Introduction

Nail salon workers are a population vulnerable to several notable occupational hazards. Chemical exposures are of chief concern as nail salon workers handle and utilize

products that contain hazardous and carcinogenic compounds, such as the “Toxic Trio” of toluene, formaldehyde, and dibutyl phthalate (DBP) (Ford and Scott 2017; Huynh et al. 2019; OSHA n.d.; Quach et al. 2018; Shendell et al. 2018). These and other chemicals utilized in nail salons have been connected to adverse human health outcomes such as respiratory and dermal irritation (e.g., allergy, asthma, contact dermatitis), endocrine and neurological consequences, and potentially cancer (Gorman and O'Connor 2007; Kwapiński et al. 2008; Ma et al. 2019; Quach et al. 2008, 2013, 2018; Shendell et al. 2018). Furthermore, nail salon workers are susceptible to biological hazards as they have close contact with clients who may have cuts or breaks in the skin—leading to bloodborne pathogens exposures—or dermal contact with fungi (Sekula et al. 2002; Yang et al. 2014). In addition to the aforementioned chemical and biological

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occupational risks, nail salon workers face ergonomic vulnerabilities (Huynh et al. 2019; Shendell et al. 2018). Prolonged sitting, awkward posturing, and frequent bending in nail salon work can result in back and neck pain and other musculoskeletal disorders among workers within this industry (Huynh et al. 2019; Ma et al. 2019; Shendell et al. 2018).

Despite these potential occupational hazards, employment in the small business nail salon industry continued to expand up until the COVID-19 pandemic (Huynh et al. 2019; Kim 2020; Zhong et al. 2019). As of 2018, there are approximately between 126,300 and 212,600 nail salon workers throughout the United States, although that is likely to be an undercount due to the number of immigrants employed in this industry (UCLA Labor Center 2018). It is estimated approximately 80% of the nail salon workforce are women and 80% are immigrants, with more than half of those immigrants being of Vietnamese descent (UCLA Labor Center 2018). Working in this field can be appealing to those who are foreign-born because of the lower barriers and requirements for education/training and English fluency (Ford and Scott 2017; Huynh et al. 2019; Ma et al. 2019; UCLA Labor Center 2018). However, the language barrier in tandem with the lack of culturally-appropriate education, training, or occupational safety and health information available in languages besides English can result in additional or exacerbated occupational hazards (Huynh et al. 2019; Quach et al. 2018; Zhong et al. 2019). While research in the past decade has aimed to highlight the occupational hazards faced by nail salon workers, the workers of this industry still comprise a population that is underserved and often overlooked in occupational safety and health (Ford and Scott 2017; Huynh et al. 2019; Ma et al. 2019; OSHA n.d.; Quach et al. 2018; Shendell et al. 2018; Zhong et al. 2019). Given the vulnerabilities and disparities that this worker population of nail salon workers faces, research conducted on or with nail salon workers and owners has generally taken a community-based participatory approach (CBPR).

Thus far, qualitative studies among nail salon workers and owners have centered around topics including but not limited to: workers' perceived health benefits and concerns, knowledge about work-related hazards (e.g., chemical, biological), salon management's policies, owner-worker relationships, and challenges working in a nail salon. Primary findings from these studies highlighted the need to diversify stakeholders, including engaging nail salon workers and owners, and targeting upstream issues resulting in poor nail salon workers' health such as public policy changes and environmental health justice initiatives (Freeland et al. 2020; Huynh et al. 2019; Lee et al. 2021; Quach et al. 2015). However, to our knowledge, none of these qualitative studies on nail salon workers explicitly sought the workers' input on their needs to mitigate and manage workplace exposures and desired interventions and intervention modalities based on

the occupational hazards identified. Moreover, many studies focused on nail salon workers look at populations in coastal states and populous cities where there are larger immigrant populations (e.g., California, Philadelphia), but also, in turn, have greater community support and resources available for these workers (Garcia et al. 2015; Huynh et al. 2019; Lee et al. 2021; Quach et al. 2012; UCLA Labor Center 2018). Nevertheless, there is still more work to be done in this specific worker population to bring to light the occupational health hazards and barriers they face.

The purpose of our qualitative study was to build upon previous efforts by not only recognizing nail salon workers' perceived risks to their health but also better understanding their needs and desired interventions to bolster occupational safety and health in the workplace. Furthermore, this study is focused on nail salon workers in the Midwest, who are often overlooked compared to their coastal counterparts. With the information gleaned from this study, the intention is to inform intervention design that can be well-received and promote the health and safety of nail salon workers.

Methods

Study design

This qualitative study was informed by the phenomenology methodological framework anchored within the critical social theory. Phenomenology allows for meaning-making of an individual's experience regarding a particular phenomenon (Wojnar and Swanson 2007). The critical theory lens adds the additional complexity of consciousness-raising, whereby individuals ascribe meaning to their experiences and identify the forces that influence those experiences (Ngwenyama 1991). Guided by this methodological framework we asked participants to reflect on their experience as nail salon workers. As supported by Beavan (2014), our questions were exploratory and open to allow participants to ascribe meaning to their experiences while they were sharing. For example, we asked questions starting with, "tell me about..." and "tell me how...". Our critical lens guided our approach to probe participants to reflect on the key factors that influence their experiences as nail salon workers with particular training and background (e.g., being immigrants).

Recruitment and enrollment

A list of 32 nail salons from two major cities in southeast Michigan was compiled. Flyers and recruitment scripts in English were developed. Research team members physically visited salons on the list to distribute the flyers. The script enabled the research team members to relay the same information about the project while distributing the flyers. Once a

nail salon owner expressed interest, the research team members offered various options to conduct the focus groups. The potential locations included a conference room at the university; a conference room at the local library; and the nail salon. Once the locations were selected, a research team member scheduled a time to conduct the focus group. The nail salon owner was asked to encourage their workers to attend. The study was approved by the authors' Institutional Review Board (IRB).

Inclusion and exclusion criteria

To participate in the study individuals had to be currently working at a nail salon, aged 18 years or older, be able to speak and comprehend conversational English, and be able to provide verbal and written consent in English. Individuals who provided nail services in their homes were excluded.

Interview guide

The interview guide was informed by the phenomenology methodology through a critical theory lens. The interview guide questions (Table 1) were focused on participant's experiences as a nail salon worker, their health and safety concerns, and the forces they believed were influencing their ability to perform safely at work. Participants were also asked to share their thoughts on key topics they would like to see covered in an intervention program. Probing questions were used to encourage participants to elaborate further. For example, when participants were asked for their input on an intervention programs, we asked follow-up probing questions such as: How would like to receive this training? Who do you think the training that you are proposing would be most beneficial to you? When participants were asked about how they believed their work affected their health, the research team member would follow-up by saying "tell us more"; "what are some examples of what you are experiencing?"

Data collection

The focus groups were conducted between July and October 2017. One focus group took place in a private conference room at a local library. Nail salon workers who were not

scheduled to work that day participated in this first focus group. The other two focus groups took place after hours at the nail salons. A research team member who was fluent in Vietnamese was present during two of the focus groups and assisted with any translations during the conversation in case participants felt more comfortable communicating in their native language. By the third focus group, participants' accounts were similar, indicating that we had reached saturation in addressing our research question. The focus groups were audio recorded and lasted between 30 and 90 min. Participants received \$50 for their participation.

Data analysis

Content analysis was used to analyze the transcripts (Graneheim and Lundman 2004). The process required multiple steps. First, each focus group interview was transcribed verbatim. Second, two research team members independently read each transcript to have a general understanding of the narratives. Each coder then re-read the transcripts to highlight key passages as informed by our study goals, anchored within phenomenology methodology, which were to (1) to understand participants' experiences as nail salon workers, (2) understand the factors participants perceived as influencing their experiences, and (3) explore perceived intervention needs. Third, following Graneheim and Lundman's approach to qualitative data analysis, for each of the highlighted sections, the coders independently noted meaning unit (direct participant quotes) followed by associated condensed meaning unit (paraphrasing of the quotes) and interpreted meaning unit (interpretation of the quotes). Fourth, a team meeting was held with both coders and a third research team member to discuss any discordance. Lastly, during the meeting, study themes were discussed and finalized.

Rigor

The interviews were audio recorded allowing for research team members to revisit the data for accuracy. The ability to return to the data source and verify that the information is well represented is a recommended approach for qualitative studies (Oliver et al. 2005). Study rigor was also strengthened with the third research team member meeting with the two coders to discuss and finalize the themes. Lastly,

Table 1 Example interview questions

Tell us about your experience as a nail salon worker.
How do you think your work affects your health?
Tell us a story about something that happened at work that made you feel uncomfortable or unsafe.
Considering what you do at your job, what are some of the health issues you experience that you believe are because of your job?
If we were to develop a training program for nail salon workers, what are the key components you think we should include?

we used member checking to ensure validity and reliability (Guba 1981; Morse 2015). For member checking we asked questions about topics that were discussed during previous interviews and asked for interpretation. For example, for the third focus group the research team members shared with participants that previous focus group participants highlighted lack of training as concerning and asked what their thoughts were on this topic.

Results

Participant demographics and characteristics

Research team members visited and provided flyers to 23 nail salons from the compiled list of 32. Three focus groups were conducted representing four nail salons. Two of the focus groups were conducted in the respective nail salons (two nail salons). The third focus group was held in a local library with participants representing two nail salons. Each focus group had between three to six participants, including two owners ($N=13$). Ten of the 13 participants were of Vietnamese descent (76.9%), followed by Indian ($n=2$; 15.4%) and Caucasian ($n=1$; 7.7%). Most participants were female ($n=11$; 84.6%). Participants had been working as a nail salon technician anywhere from 2 to 17 years and worked an average of 8–9 h a day, but sometimes also worked overtime 2–3 h a day for as much as 10–11 h a day.

Our findings were organized into three major categories. The first category focused on the workers' perceived work-related stressors. The second category focused on the health issues perceived to be directly related to workplace exposures. The third category reports participants' perceived intervention needs and considerations for next steps. Each of the categories is described below with their respective themes.

1st Category: Perceived work-related stressors

Six themes were identified relating to participants' perceptions of work-related stressors. The themes were: (1) Lack of standardized policies, regulations, and education/training; (2) Disconnect between education/training and real-world practice; (3) Inadequate knowledge on exposure risks and safety protocols; (4) Unsafe nail products; (5) Customer pressure; (6) Immigrant-related pressures.

Lack of standardized policies, regulations, and training

Study participants highlighted that lack of standardization in policies, regulations and education/training nationally can increase risks for exposure and poor health. They noted that across states, there were discrepancies related to inspections

and requirements for safe material disposal. For example, having worked as a nail technician in two states, one participant discussed the differences between policies across the two states. The participant stated that she felt shock upon learning that regulations in the previous state were stricter than those in Michigan and used the frequency of inspections as an example. She commented:

It's interesting, in Michigan, they're a little less strict than they are in Ohio. Like, the Ohio State Board comes around at least two to three times a year...and they don't tell you, they just show up (F1, P1).

Participants further explained that a lack of inspections from the state board in Michigan compared to other states could lead to workplace safety negligence:

I think most of the salon owners, they're working themselves. If they're working themselves, then they're not implementing these procedures of sanitation, then it doesn't— you know, they will be like "Okay, it's good that the board is not coming" (F1, P3).

In addition, one participant noted the difference in regulations regarding material disposal between Ohio and Michigan:

They have, like, I believe in Michigan, you can reuse certain implements, whereas, in Ohio it's like, basically the rule is, if it's porous, it gets thrown out, so like: foot files, files, buffers (F1, P1).

Participants also reported that they did not receive the same or standardized education and training as their co-workers, which created a source of stress. Education and training for nail salon technicians vary across schools and states. For example, participant 2 from the first focus group mentioned that the educational/training requirements differ between Texas and Michigan. She described her experience getting training in Texas saying, "*I'm training from school from Texas, so we require 600 h. But Michigan I think how many hours we need here 400*" (F2, P1).

Disconnect between education/training and real-world practice

Participants also noted how the knowledge they gained during their schooling and training programs often did not match the requirements and practices of the nail salon where they work. One participant noted how textbook materials do not reflect what happens in real life:

And, the thing is, when you go to school, the most that you do is, uh, theoretical and, the hands-on practical is pretty much when you come to the real world, get to the salon. And that's when you find out that what's

in the book is not actually practiced completely, well, not even close to completely (F1, P3).

As seen by this statement above, participants did not believe that their vocational education fully prepared them for the workforce.

Another participant from focus group 3 also expressed similar sentiments discussing how the differences in the anatomy of each individual is something that cannot be explained within a textbook. She stated, “*So we get a lot of information during school but the practical work we do out in the salons is what’s most important I think because everyone’s body is not just a copy out of a biology book, right?*” (F3, P3).

Furthermore, there were certain scenarios that were not covered in their training that participants came across regularly at work, such as when a client gets a cut and starts to bleed. One participant stated, “*At least I personally was never taught anything, like, say, if we do happen to cut somebody and they do start bleeding, that was never really [taught]*” (F1, P1).

Inadequate knowledge on exposure risks & safety protocols

A common topic that was discussed in all three focus groups was the sense of lack of knowledge on the various exposures they encounter at work. One prominent concern was how to address biological exposures, such as what to do when a client starts bleeding. The sense of fear related to lack of knowledge was further exacerbated due to the variations in salon safety protocols when exposures occur. Between the three focus groups, each safety protocol was different. One participant in the third focus group noted that each salon has a slightly different procedure in place, “*There are first aid procedures that every salon has so ours is a bit different we have um I don’t know what it’s called it’s a tiny blue bottle that stops the blood from continuing to come out*” (F3, P2).

The blue bottle mentioned by participant 2 from the third focus group is a liquid bandage, used by participants in the other focus groups as well. Utilizing this type of glue (liquid bandage) was a common way of addressing occupational bloodborne exposures in their procedures as it sealed the client’s skin to stop the bleeding:

So what I do when I see the blood is to uhh we [were trained] that the way is to don’t be afraid, to just shut off your tool and then just hold it and get the napkin or paper towel, spray alcohol on it, tap it there, hold it there tight as you can, until that you can stop all the bleed out...And then we do it again with the alcohol and do it again. So, what we do is again we tell them I’ve been using glue for 17 years and I know how cut myself with the drill so we just tap the glue in there and then all set ... (F2, P1).

This participant reported using the same measures for herself and the client when there is a cut that yields blood.

Although each salon had their own procedures in place, there was still uncertainty about how to address this situation as a participant in the first focus group wondered if they were supposed to continue working if their client had started bleeding:

I mean, it does happen. I mean, I’ve even been filing someone’s calluses, not realizing how thin their skin was, and just filed a little too roughly and just scraped them up a little bit and, it’s like, are they okay to go back in the water? Should I just leave their foot out? I don’t really know what to do, they [client] want me to keep going (F1, P1).

One participant explained that, “*there’s really no procedures in place or any kind of education in place to kind of know how to handle those kind of situations*” (F1, P1).

Unsafe nail products

Participants expressed concerns about the safety of the products they use at work. One of the most worrisome products that nail salon workers have come across is the liquid monomer used for binding artificial nails to a client’s real nail. Participants reported concerns about working with this monomer. One even stated, “*I had some of it on a paper towel and I accidentally put a phone on it and it started, like, the paper towel melted into the phone*” (F1, P1). Participants reported that the use of unsafe products were directly related to cost. They highlighted that cheaper, lower quality nail products, were more hazardous and/or containing more potentially toxic chemicals.

I have people ask me well, I go to this place, and they charge me this much, like, why are you, why, why are your prices so much higher? and I’m like well, because they’re probably using not-correct products (F1, P1).

The participants expressed that use of cheaper, more harmful products allowed for better market competition. Participants reported that acquiring less safe products might lead to higher spending which in turn leads to higher invoices for the customers. This can negatively affect the size of their clientele.

The clients, they don’t even want to know about these stuff, because they want to go after the cheap service. They don’t want to pay right amount and good quality and good products, so that is very concerning (F1, P2).

Participants believed that clients may not be willing to pay higher amounts of money regardless of the reasoning.

Customer pressure

Customer pressure was a source of concern for the nail salon workers. The participants discussed instances when they felt uncomfortable while providing services to the customers. Participants from all three focus groups described times during which they were asked by clients to do something that was outside of scope of practice or comfort level. A participant explained: “*So the customer if they ask us to do something like we are not comfortable with, the service if they ask something like to do more job and they don’t want to pay for it*” (F2, P1).

Participants expressed that the customers lacked an understanding of their training, scope of practice, and the limitations of their service. For example, a participant reported that a client instructed them to cut live skin, which is out of the scope of work for a nail technician.

You’re not supposed to cut into the skin around the cuticle because that’s one that’s one supposed to protect your nail root and your cuticle to bacteria but a lot of clients don’t understand that very important part right there they just ask to cut out so basically I learn the nail structure and stuff like that (F2, P5).

Participants noted the customers’ expectations for them to operate as podiatrists and often are asked to diagnosis issues such as foot fungi.

I always suggest, like, and I’m always—or people come in and ask like, about ingrown, they want you to cut the ingrown out and I’m always like, “I’m not a doctor, I can only do so much. You could go see a podiatrist, that’s probably what I’d suggest” (F1, P1).

Another participant from the same focus group noted:

Well usually for those customers they are really interested in knowing what fungus is that and I will just send them to doctor. Because we are not doctors, so we cannot say and tell exactly what you have. (F3, P1)

Participants expressed that customer pressure not only causes them stress but also increases their risk for exposure. For example, one worker reported a client shared that she believed she had some sort of foot fungus only after the worker had performed a pedicure without using gloves.

She told me that she had fungus on her toes and I said no I just worked on your toes and I guarantee there’s no fungus on your toes and she like no I checked with doctors and I’m like no that’s not fungus on your toe because I worked use my bare hands and (mumbles) I shouldn’t be doing that... we pause because some time it’s really hard for me to clean I clean everything to the point that the (mumbles)

through my glove so I start to use the (mumbles) with my bare hand and I clean everything and she tell me that she had fungus on her toes and she request me to use a new pair of tools and I’m like its ok I but I guarantee you that there’s no fungus on your toes and she tell me that no that I checked with a doctor that is a fungus on my toes (F2, P5).

Additionally, the participants reported that clients sometimes request that they continue to provide service even after the client has been cut and starts bleeding, potentially placing the technician at risk for bloodborne pathogens exposure. One participant explained, “*Like with the customer that we have is the...when we are cutting it depends on that customer request, ‘I want more, I want more’*” (F2, P1).

Participants discussed the difficulty of communicating to customers that a certain service is not possible. Customers may become upset and some even threaten to take legal action. One participant recalled an encounter she had with a physically disabled client asking her to come to their house to provide services: “*We have [don’t] people [to go to] the house for the pedicure they don’t have to come to the salon and threaten us to be suing us because we do not have that service for them*” (F2, P1). Another participant stated, “*I think a lot of people that work in this industry they get a lot of [worry about] client coming back and suing us for hurting them*” (F3, P2).

Immigrant-related pressures

Participants also noted that being immigrants posed specific challenges. Aspects relating to being an immigrant, such as language barriers lead to multiple challenging encounters with training/informational material and clients. One participant talked about how confusing Safety Data Sheets (SDS) can be stating that, “*We have to read through that but the safety guidelines are always vague and there are times when something is written a bit too clearly or a bit too specifically and the instructions get lost in a bunch of fluffy words*” (F3, P3). This participant also described their experience in the workplace taking on the role of a translator for co-workers even though they have difficulties relaying information that they themselves cannot fully comprehend:

They are all in English, they are all in English which creates another problem because not all nail techs read English so at that point it’s up to the manager or someone like me that’s a bit more fluent in English to translate the information. But I am not a professional translator and nor is my manager and so the amount of information that they give on the safety regulations is...sufficient but cannot be translated into Vietnamese (F3, P3).

Participants also reported experiences of microaggressions and discrimination because they are immigrants. One participant told a story of how a client told her that they were glad that she was fluent in English, implying that the client might have found it difficult in the past to communicate with nail salon workers who were not fluent: *“People come in and they go, ‘Thank God you speak English!’ And I’m like, ‘You’re welcome...?’”* (F1, P1).

2nd Category: Health issues perceived to be directly related to workplace exposures

Two themes were identified regarding participants’ health issues that were perceived to be directly related to workplace exposures. The themes were: (1) Symptoms experienced due to contact with and inhalation of nail products and (2) Symptoms experienced due to poor ergonomics. These health issues included pain, nose, and eye irritation as well as sensitivity, wheezing, and difficulty breathing. In addition to the mental stress, participants attributed the health symptoms primarily to the products they use at work and poor ergonomics.

Symptoms experienced due to contact with and inhalation of nail products

Participants in all three focus groups highlighted the potential dangers of when the nail products come in contact with their skin, as well when they inhale the dust from filing or polishing. One participant noted that she had to stop providing acrylic services when she noticed some symptoms, *“Yeah, when we working in salon get tired and what I am thinking that has happened to me that is why I quit doing acrylic for 7 months that...if I do that my skin gets so tingling”* (F2, P1). This participant was able to trace the dermatological tingling sensation to the nail products used. A different participant noted how she noticed certain symptoms when working with the liquid monomer used for applying artificial nails:

I would just be really wheezy. I would feel like I had sinus issues all the time. Um, I’d get headaches from the liquid, the liquid smell, um. Yeah, it was mainly just, like, I’d feel like my nose was itchy all the time, all the time (F1, P1).

Although the monomer was the main nail product of concern, a participant also mentioned a different chemical, *“And even acetone, acetone can melt through plastic, too. You’ve got to be careful with that one”* (F1, P1). Participants also mentioned handling acrylic nails to the best of their understanding and demonstrated curiosity in learning more about how harmful it can be for their health and wellbeing.

So, the question I want to ask you in your investigation is like during my thirteen years I had a lot of acrylic nails with acetone and the liquid and...they lose the capability of pregnancy. So, I’m not sure if that true or not (F3, P1).

Participants reported experiencing health issues they did not have prior to working as a technician. One participant even discussed how she was unable to work during her pregnancy due to hypersensitivity that made it difficult to be around the dust and strong chemical odors in a nail salon. Upon taking leave from the nail salon, the participant no longer had the symptoms that she experienced before:

Even when I’m pregnant I am working ’til my baby but I know my second kid when I have [redacted name] I couldn’t walk into the salon and that’s my first salon and we using whatever products I don’t care because we charge it so cheap that’s why I know it’s like my face is tingling I get so tired so my eyes so red when I know I been there all day for the salon for hours so my eyes get reds I know my body is not healthy (F2, P1).

Another participant noted the bodily discomfort due to their job, *“I would say...back, eyes...I think those are probably the two major things”* (F2, P2). Yet another explained that the eye fatigue observed could be attributed to *“...all the lights that we use like if you know like in dim light conditions or really bright lights”* (F2, P3). A participant from the same focus group also mentioned, *“...you know on the day you are exposed to the dust and stuff, so your eyes get dry”* (F2, P6).

Symptoms experienced as a result of poor ergonomics

In all three focus groups, participants expressed that they regularly experienced physical pain, especially in the neck and back. Participants discussed that workers sometimes had to engage in poor ergonomic practices due to the high demand for services in the space-limited, resource-limited settings of a nail salon:

But when the busy hours come around all of the chairs are filled and there is no place for technicians to sit. It’s a much smaller place. That’s when some technicians have to work standing, yeah standing and leaning over their chairs without being able to sit because there is simply not enough chairs” (F3, P2).

In addition to reporting these symptoms, participants discuss foreseeing future health issues that they could experience because of their workplace. One participant noted:

The biggest problem with the nail techs not currently, but in the future, will be the carpal tunnel because, when you’re holding, you know, those things at a certain angles, in eight hours a day or six hours a day or

ten hours a day, I mean, that's definitely going to hit it" (F1, P3).

A participant from the second focus group stated that these symptoms were inevitably a part of the nature of the occupation, "...but there's nothing that when you join your job your career you have to set in with that you have to make money you have no choice or you don't do it or you do it" (F2, P1).

3rd Category: Intervention needs and proposed next steps

Four themes were identified relating to participants' suggestions of intervention needs and proposed next steps. The themes were: (1) Continuing education; (2) Keeping up with new products; (3) Increased communication with key stakeholders; and (4) Partnership building and resource access. Participants proposed interventions they perceived may help promote nail salon worker health and wellbeing.

Continuing education

Some of the participants in the focus group interviews had been working as a nail technician for over 10 years. With the lack of continuing education requirements in the state of Michigan, much of the information they learned during their vocational education/training in years prior was not being maintained, "*So like [redacted] have worked in the industry for 13 plus years and that means he hasn't been to school in that time to learn about nails in 13 plus years*" (F3, P3). Although nail technicians need to renew their licenses, participants spoke about how the state of Michigan did not provide a refresher course for that process:

Um, so in Ohio, it's every— every two years, you have to renew your license. And then, you have to have eight hours of education time per two-year renewal period. So, in Michigan, you have to renew every two years, but I just went online and paid for it and they just sent me my new one. I didn't have to do anything for it (F1, P1).

Considering how new practices are constantly emerging in the nail salon industry, participants found it surprising that continuing education is not required in Michigan to further their education or review material. However, participants recognized the importance of staying up-to-date on industry practices, making it an additional burden for workers themselves to stay informed on techniques and technology:

I think the best thing to do is to go back and look at the books, and look at the theory once in a while. You know, what she does, is usually go online and watch videos. I mean, daily, I mean, she's on there. So, it's a

constant training. If you're not in the constant training, you tend to lose the sense to do what you learned in school (F1, P3).

Considering how new practices are constantly emerging in the nail salon industry, participants found it surprising that continuing education is not required in Michigan. One participant said, "*I think it's very odd, Michigan doesn't require continuing education, because I think it's very important*" (F1, P1).

Participants also highlighted that they could be more proactive about going to conventions, signing up for training sessions, or updating themselves on new products and techniques. It was clear, however, that not having a state or federal requirement for continuing education has made it difficult for many nail salon workers to feel motivated to keep up with trends or changes in the industry.

Keeping up with new products

With new products being released and demand increasing for those services, participants emphasized the need to adapt and keep up with the new products.

Um and so because there are always new products being released on the market for example, we just got a new um type of nail product called the "dipping powder" and its uh something that we haven't worked with before and that we haven't studied in nail school... we haven't studied in nail school which makes it a bit more difficult for us to I don't know adapt to a sudden change in situation and sudden change in demand" (F3, P3).

Increased communication between key stakeholders

When asked about intervention needs, participants reiterated the stressor of lack of standardization and interactions between the key stakeholders such as the state policy makers, the educational institutions in charge of their training, and the workplaces. They noted that there was a disconnect between nail product companies and nail salon workers, explaining that it would be beneficial if these companies were more proactive about education regarding their products: "*...and I think that if these companies were encouraged or pushed to send actual professionals out to individual salons to teach us about new products and to properly teach us how to use them to best serve our clients that would be most helpful*" (F3, P3).

Partnership building and resource access

Participant highlighted the importance of resource access and partnership building. One participant from the first focus

group suggested forming a partnership with local health departments:

I think of the biggest I would be to get the local health department as a partner, to do it. Uh, and not just to scare people, but at least, just a free service to the salon that, okay, the first time we just come in, we just want to train you, to keep training. And, as far as I can tell, the people, the owners, or the nail techs, anybody working in the salon, they would love to have free training (F1, P3).

Considerations for next steps

In addition to the proposed interventions, participants also provided insights on potential drivers of success for interventions. These proposed drivers of success included incentives (i.e., certificates and paid time off), intervention format (i.e., delivery methods), and language considerations.

Incentives

Participants stressed the importance of considering other forms of incentives other than financial. They gave the example of providing some type of displayable reward for completing training which would convince more nail salon workers to partake in an intervention that could also boost the salon's appeal:

You know, how different business have different certifications, you know? He, is he certified for XYZ certification, you know? It was his certification. And when customers comes into those facilities, they would rather go to the certified places than the non-certified places. You can put [the certificate] on the wall, and that actually increase the business, so on and so forth. And once, you know, you start the momentum with one or two salons in the area and someone from [redacted] Salon go somewhere else and "Oh, they're certified in that, why aren't you?" (F1, P3).

Another participant from the same focus group mentioned:

So, you know, if [redacted] has clientele and [redacted] is certified in sanitation or whatever title you want to give that, and that person goes to other salon, or you're not—you know—and she has that certification right there on the wall where she, at her workstation...So, the individual could carry this certification versus a salon carrying it (F1, P1).

Some participants noted the importance of understanding the cultural values of the group to which the intervention is being offered. One noted:

It's culture too because this may sound a bit harsh but within the Vietnamese culture there is a push for give and take so if your are giving me this money what are you going to take from me? Or I am giving you this money what am I going to take from you umm its very much embedded it our culture like you go back to Vietnam its money, money, money what are you going to pay me or what am I going to get back? And so just to have researchers come in and say "Hey we will pay you just have to sit down and talk to us" it's like really? You just want to talk? (F3, P3)

Many participants also stated that one deciding factor for them not to attend workshops was because it would require them to take time off, which would have negative financial implications for them:

I think a lot of people are kind of I don't know scared and shy to go to a focus group or go to classes because it takes time out of their day...Because just like spending a whole entire day at a salon or I think 10-7 is a nine-hour day and maybe even working overtime would make it ten hours or eleven hours even. Umm, it's kind of hard to get to a class (F3, P3).

It was also noted that future interventions must take into account the time commitment that it takes on top of a demanding work schedule and their busy personal lives:

I think it is really hard to convince people to participate in research especially people in the nail salon industry because a lot of us are foreigners. We kind of just want to just go to work and go home and lead very peaceful normal lives instead of participate in anything that is considered extra-curricular (F3, P3).

Intervention format

Intervention format was important for study participants. There was some disagreement on the ideal format. Some participants recommended making brochures that could be easily distributed and accessed. Others admitted that a brochure could easily be disregarded or discarded:

It's just easier to just turn something on your phone then try to flip through it but with an actual brochure and you can try to look through it but it will actually just go home and be thrown in the trash bag or used as a coaster (F3, P3).

The same participant explained that shorter informational videos would be better, "*I think to encourage people to watch the videos will showing a lot of information anything short and quick and fast something 3–5 min as opposed to a 15-min long lecture*" (F3, P3).

Participants from the other two focus groups, however, stated that they preferred an in-person class no longer than six hours.

Language considerations

Participants suggested that interventions should be provided in multiple languages, considering that so many nail salon workers are foreign-born. Some languages in which other materials could be provided are Vietnamese, Thai, Cantonese, and potentially Spanish.

So, if information can be provided in the form of a video online, or brochures online, in both English and Vietnamese. We have a lot of Thai people working at both salons too so maybe even in Thai so it is easily accessible at home (F3, P3).

Discussion

The occupational hazards faced by nail salon workers remains a pervasive issue within this industry. The research on occupational hazards that nail salon technicians encounter, and specifically those with predominantly immigrants, has increased over the last decade (Gorman and O'Connor 2007; Kwapniewski et al. 2008; Ma et al. 2019; Quach et al. 2008, 2013, 2018; Shendell et al. 2018; Zhong et al. 2019). Many of these studies have been quantitative in nature and focus on chemical exposures—and their subsequent health effects—and to a lesser extent, ergonomic exposures (Ma et al. 2019; Quach et al. 2013, 2018; Zhong et al. 2019). However, to our knowledge, few studies have explored how these nail salon workers perceive their health risks and exposures to hazards in the workplace and aim to determine what the workers' needs are to improve their occupational safety and health outcomes.

This qualitative study, guided by a phenomenological theoretical framework anchored within critical social theory, aimed to fill that gap of understanding workers' needs by collecting data from focus groups of nail salon workers in southeast Michigan to better understand how they perceived these risks. From the three focus groups conducted with a total of thirteen participants, the workers were predominantly female and of Vietnamese descent. The findings of the focus groups were organized into three major categories: 1) Perceived work-related stressors, 2) Health issues perceived to be directly related to workplace exposures, and 3) Intervention needs and proposed next steps. These findings support previous work by Freeland et al. (2020), Huynh et al. (2019), Lee et al. (2021), and Quach et al. (2015) that nail salon workers have a plethora of barriers hindering them from improved occupational health and

safety environments—from the personal level to the policy level—and build upon their efforts by delving further into potential interventions that the workers have identified from the personal level to policy level, along with ideal methods of implementation.

Implications

Research

Aforementioned, given that nail salon workers frequently come from vulnerable and underserved populations, any intervention with this community should incorporate stakeholders from the worker community or implement CBPR. CBPR fosters an equitable partnership with those directly affected by and knowledgeable of the situations that most impact their health and health risks, as demonstrated by the categories and themes detailed by the participants in this study (Horowitz et al. 2009; Wallerstein and Duran 2006).

Since customer pressure was a pervasive theme that emerged from the first category, further exploration may be merited to understand nail salon customers' perceptions of nail salon workers' scope of work and the services they provide. This might be achieved through focus groups or semi-structured interviews with nail salon patrons, as it has been done with other populations to better understand perceptions towards a particular topic (Bajramovic et al. 2004; Butow et al. 2011; Munir et al. 2010). By better understanding what nail salon patrons perceive to be the norm of services to be provided or requested for (e.g., customers expecting nail salon workers to be able to identify and diagnose foot fungi or dermal conditions when that is outside the scope of their work), messaging and signage can be implemented in salons so customers are aware that things such as diagnosing dermal issues or cutting live skin are outside the workers' scope of work.

Furthermore, a survey of safety climate—shared perceptions employees of organization share about the importance of safety at their workplace at a particular point in time—can help determine which facet of the workplace identified to be a factor (i.e., management attitudes towards safety, co-worker support, workload) can be addressed to enhance workplace safety climate. Positive safety climate has demonstrated to enhance employee safety knowledge, increase employee motivation to behave safely, increase uptake of safety programs and policies, reduce reportable workplace incidents, and improve employee perception of management support (DeJoy et al. 2004; Dollard and Nesar 2013; Neal and Griffin 2004; Zohar 2010). Surveys and assessment of safety climate have been applied to other industries with notable occupational hazards—such as construction, nuclear power plants, and healthcare—but could be

adapted to the nail salon industry as chronic occupational exposures are present (DeJoy et al. 1995; Findley et al. 2007; Gillen et al. 2002; OSHA n.d.).

For occupational health professional practice

It should be acknowledged that working closely with nail salon workers and owners to bolster the current working conditions of the workplace is a dynamic process and one that requires patience. While environmental and air sampling might be one facet of determining what issues should be prioritized and addressed, there needs to be a recognition that not every step in the process will be as immediate as obtaining data from a direct-read instrument. For professionals in occupational safety and health who are either tasked to or feel compelled to address the occupational hazards nail salon workers encounter, certain skills should be obtained before engaging with this worker population.

Cultural competency and training on how to communicate with underserved worker populations will be essential, especially since this worker population is predominantly female and foreign-born (UCLA Labor Center 2018). Moreover, there is a vulnerable sub-group of workers within nail salon workers who are women of child-bearing age or may be pregnant when chronically exposed to chemicals, making it all the more necessary to be able to protect their health. Culturally competent approaches by professionals in healthcare have demonstrated greater patient satisfaction and compliance (Chenoweth et al. 2006; Hawala-Druy and Hill 2012; Truong et al. 2014). Hence, culturally competent approaches by occupational health professionals have the potential to elicit the same outcomes among the workers' lives they seek to positively change. Partnering with a community liaison could also be beneficial, especially if that individual or individuals are also well-versed in occupational safety and health.

Additionally, some states have programs focused on improving occupational safety and health in nail salons, such as the California Healthy Nail Salon Collaborative (CHNSC) (<https://www.cahealthynailsalons.org/>) and the Michigan Healthy Nail Salon Cooperative (MHNSC), modeled after the CHNSC (<https://mihealthysalons.org/>). These programs aim to partner with nail salon workers and owners to not only provide resources, education, and training but to also empower these workers to build their knowledge and skills on occupational safety and health and know their workplace rights (CHNSC n.d.; MHNSC n.d.). These programs could be developed and adapted in different regions, as nail salons exist in every state and in some localities represent a notable portion of small business owners.

Policy

To reach long-lasting, systematic changes to positively impact worker health, policy changes or implementation needs to occur. California and a few other states have made notable strides in policy and advocacy aimed to improve working conditions for nail salon workers. These should be considered not only in Michigan but also other states that may not have bills, policies, or regulations in place. Some policy-based changes include: advocating for state support of local voluntary healthy nail salon recognition programs; requiring safety data sheets (SDS) translated into languages primarily spoken by that worker population (e.g., Vietnamese, Korean) to be strictly required by states and in place by employers; requiring continuing education units/credits on a regular, periodic basis to maintain state licensure as a uniform requirement across all states (e.g., national guidelines or regulations); strict requirement ingredients to be listed and labeled on cosmetic products by the U.S. Food and Drug Administration (FDA) and enforced as this is part of the Occupational Safety and Health Administration's (OSHA) Hazard Communication Regulation, in addition to requiring labels for bottles/containers in the salon at each station; requiring basic information on labor law for licensing and renewals with the state cosmetology board; and requiring the OSHA bloodborne pathogens standard (29 CFR 1910.1030) to be applicable to all nail salons so workers receive bloodborne pathogens and universal precautions training, as well as refresher trainings (California Healthy Nail Salon Collaborative n.d.; Quach et al. 2015; Sekula et al. 2002; UCLA Labor Center 2018). Furthermore, stringent regulation and enforcement of OSHA's Hazard Communication standard (29 CFR 1910.1200)—now aligned with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)—would require employers to train workers on how to understand the new labeling requirements and access new, abbreviated SDS to facilitate recognition and understanding (OSHA 2021). Michigan would benefit from a streamlined process to reinforce training, continuing education, and provision of language-appropriate materials. Some of the above-mentioned policy recommendations were also proposed by the workers in the focus groups—especially in the first and second categories of findings—lending greater precedence for movement and advocacy to have these policies be established and implemented.

Limitations

This study is not without its limitations. This study focused on nail salons and nail salon technicians that predominantly employed Vietnamese individuals in the upper Midwest and may not be generalizable to all populations

of nail salon workers. Furthermore, with all focus groups, most of the type of information that is likely to emerge are what the participants have in common and share; this may not lend to connecting to the experiences of specific individuals. As a result, there is no guarantee that there were no misinterpretations of the questions or conveyance of answers (Acocella 2012). One may also note that the sample size of 13 as a limitation. However, given our research questions for this qualitative study, we were able to reach saturation and gather rich data to inform next steps on how best to promote the health and safety of this working population.

Conclusion

To our knowledge, this was the first qualitative study that not only sought to understand nail salon workers' lived work experiences and perceptions of health risks. It also sought to understand these workers' needs and suggested interventions to bolster occupational safety and health in an overlooked worker population, in an overlooked geographic location. Future research should seek to better understand nail salon employees' perception and uptake of implemented interventions and expand the scope of attention and research to better their occupational safety and health outcomes with nail salon workers to geographic locations outside of coastal states and populous cities to areas where workers may have a greater dearth of support and resources.

Acknowledgements We would like to thank the following individuals and organizations for their contribution to the Michigan Healthy Nail Salon Cooperative and efforts to facilitate the partnerships that made this manuscript possible: Dr. Edward Zellers (University of Michigan School of Public Health, Department of Environmental Health Sciences); Stephanie Sayler (University of Michigan School of Public Health, Exposure Research Lab); Albert Tien (Workplace Health Without Borders); NGO Workplace Health Without Borders United States Chapter; Lexuan Zhong (University of Michigan School of Public Health Stuart Batterman Lab); Ritu Pandit (Former Industrial Hygiene research staff with University of Michigan School of Public Health); students- Khanh Huynh, Rachel Neuenfeldt, Sandar Bregg, Sa Rah Oh, Allyson O'Connell, Mary-Catherine Goddard, Dylan Gooch, Elizabeth Guthrie, Michelle Nguyen, Courtney Crawford, Xenia Chan, Wei Li, Yang-Ju Chen; and all participating nail salon workers, owners, and management.

Authors' contributions JVD coded and analyzed the focus group transcripts, as well as outlined and wrote parts of the manuscript. MAR conceptualized the study, conducted the focus groups, oversaw the coding of the transcripts, wrote parts of the manuscript, provided critical edits, and supervised the overall study. ABL wrote parts of the manuscript and provided critical edits.

Funding This study was funded from the MAR's discretionary research account and received no specific funding source or grant.

Declarations

Conflict of interest The authors have no conflicts of interest to disclose.

Ethical approval The study protocol was reviewed and approved by the University of Michigan's Institutional Review Board, Protocol #HUM00129905.

Consent to participate Prior to participating in the focus groups, each participant read and signed a written consent form. The final section of the consent form read as the following "By signing this document, you are agreeing to be in the study. We will give you a copy of this document for your records. We will keep one copy with the study records. Be sure that we have answered any questions you have about the study and that you understand what you are being asked to do. You may contact the researcher if you think of a question later."

Consent for publication All authors consent to publication. There are no data or images to consent to.

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