Nurses' Experiences of Working While Pregnant: A Qualitative Descriptive Study

Abstract

Background: Healthcare work environments are fraught with occupational hazards that can impact nurse health as well as patient care. However, little is known about how these hazards impact nurse health during pregnancy, and the experiences of nurses in the work environment during pregnancy and upon their return postpartum.

Objective: To describe registered nurses' (RNs') experiences of working while pregnant and returning to work postpartum. Specifically, their experiences related to the work environment and work-related hazards.

Design: A qualitative descriptive design was utilized to describe nurse experiences at work, occupational hazards during pregnancy, and experiences of returning to work after pregnancy.

Participants & Setting: A convenience sample of twenty nurses working in direct patient care roles across the United States were recruited for virtual semi-structured interviews.

Method: Participants were interviewed using a semi-structured question guide to explore nurse experiences, specifically occupational hazards at work during pregnancy and upon returning to work. Interview transcripts were analyzed using deductive and inductive content analysis.

Results: Deductive findings for occupational hazards and risks during pregnancy and postpartum included exposure to infectious diseases, imaging, physical tasks (e.g., lifting and performing CPR), cleaning products, patient violence, and medication administration. Inductive thematic findings included: support needed avoid occupational hazards and make necessary modifications; desire to be 'supernurses' and put the patient first even when it meant taking risks for our health and that of their child; and fear of the consequences of occupational hazards and exposures.

Conclusions: Occupational hazards experienced by nurses during pregnancy that may impact their health and that of their baby were broader than previously studied. Pregnant nurses should receive education from their healthcare providers early in their pregnancies about the occupational hazards themselves and the potential modifications they should seek. Managers, occupational health and other health system leaders, and policymakers should be aware of occupational hazards for nurses, including pregnant nurses, and support workplace modifications. Future research should focus on assessing the prevalence of these hazards, the longitudinal impact of exposures that can lead to negative consequences for nurse and fetal health, and reducing the risk of exposure to these hazards for pregnant nurses.

Tweetable abstract: RNs described a variety of occupational hazards of working while pregnant and postpartum. Inconsistent ability to modify work to protect self and baby leads to completing work demands known to be hazardous.

What is already known about the topic?

- Hazards in the nurse work environment impact nurse health and safety.
- Previous research has suggested that nurses' occupational exposures during pregnancy may be linked to preterm birth, spontaneous abortion and decreased fertility.

What this paper adds:

- Nurses' descriptions of their experiences working during pregnancy and postpartum, specifically the occupational hazards encountered.
- Identification of barriers and facilitators to modifications to control hazards for healthcare providers and leaders.

Keywords: Nurses, occupational health and safety, pregnancy, qualitative

Introduction

Registered nurses (RNs) make-up the largest portion of the healthcare workforce globally (World Health Organization, 2017). In the United States, the majority of the nursing workforce is female (90.4%) and of childbearing age (18-49) (49.2%). While nurses can work in many healthcare setttings, hospitals are the most common workplace for RNs in the United States (Bureau of Labor Statistics, 2018; Smiley et al., 2018; U.S. Department of Health and Human Services, 2017). However, hospitals are classified as a hazardous work environment by the United States Occupational Safety and Health Administration (OSHA) (2015). Nurses can experience a variety of hazards that are linked to adverse health outcomes, including blood-borne pathogens, antineoplastic medication administration (medications used to treat cancer), musculoskeletal injuries, needlesticks, fatigue, and stress (American Nurses Association, 2011; Panlilio et al., 2004). Nursing workplace hazards during pregnancy have been linked to increased risk for miscarriage, preterm birth, and spontaneous abortions (Gaskins et al., 2015; Lawson et al., 2012; Lawson et al., 2009; Whelan et al., 2007). However, little is known about how workplace hazards affect nurse health during pregnancy and what modifiable workplace factors (e.g., work tasks or scheduling) can improve nurse health and pregnancy outcomes. Therefore, it is crucial to investigate workplace hazards and modifiable workplace factors, and their relationship to nurse health during pregnancy, including adverse pregnancy outcomes.

Suboptimal mental and physical health has been reported by 54% of nurses, while over 60% report utilizing poor stress coping mechanisms (Jordan et al., 2016; Mazurek Melnyk et al., 2018). Rates of nurse injuries at work in the United States continue to be high, with 42% of nurses reporting job-related injuries at least once in the last 12 months, 384,325 nurses experiencing a sharps injury annually, and 5.6 million nurses are at risk for blood-borne

pathogen transmission (American Nurses Association, 2011; Panlilio et al., 2004). Because of these hazards and the finding that hospital work environments are slower to address worker health and safety than other industries, OSHA (2013) declared hospitals in the United States a hazardous work environment. Nurses providing direct patient care in non-hospital settings including long-term care, rehabilitation, and infusion facilities face many of the same workplace hazards (Markkanen et al., 2017). These health and safety hazards may be more serious for pregnant nurses due to the vulnerable nature of pregnancy.

The largest source of research for understanding the role of occupational hazards among nurses in the United States during pregnancy is the Nurses' Health Study Cohorts (NHSII, NHSIII). The NHSII is a large, prospective cohort study of nurses and their health over the course of their lifetime (n=116,429). At enrollment, this study recruited nurses and nursing students, with or working toward any license (RN, Licensed Practical Nurse, specialized RNs) between 25 to 42 years old. Shift work, specifically rotating, night or longer shifts, is an increased risk for adverse pregnancy outcomes (Cai et al., 2019). Whelan et al. (2007) found that nurses in the first trimester who worked "nights only" had a 60% increased risk of spontaneous abortion in comparison to those who usually reported working "days only,"and those who worked more than 40 hours per week had a 50% increased risk of spontaneous abortion when compared to those working 21-40 hours per week. Similarly, nurses who administered antineoplastic drugs had a two-fold increase in risk of spontaneous abortion compared to those nurses who did not give these medications (Lawson et al., 2012). Nurses working more than 40 hours per week when compared to those who worked 21-40 hours per week, and nurses who reported moving heavy loads more frequently in comparison to those who never lifted or moved heavy loads both had decreased fertility (Gaskins et al., 2015). Lawson et al. (2009) found that

nurses exposed to sterilizing agents had increased risk of preterm birth. These studies have laid the groundwork for understanding the excess burden nurses face while working during pregnancy; however, they have collected limited information on occupational environmental hazards. The proposed study sough to address gaps in the previous work by identifying the breadth of hazards and modifiable factors that affect nurse pregnancy through qualitative interviews. The purpose of this study was to describe RNs' experiences of working while pregnant and returning to work postpartum. Specifically, their experiences related to the work environment and work-related hazards.

Methods

A qualitative, descriptive approach was utilized, as this method can provide a rich description of participants' experiences and perceptions of a phenomenon. Qualitative descriptive methodology is especially suitable when little is known about a phenomenon. The findings produced in a qualitative descriptive study stay close to the data as given, which gives voice to the participants' experiences (Neergaard et al., 2009; Sandelowski, 2000, 2010).

Recruitment and Ethical Procedures

A convenience sampling strategy was used to recruit RNs working within the United States. Inclusion criteria included individuals who were 1) licensed as an RN, 2) had prior experience working full time as an RN while pregnant within the last five years or were currently pregnant working as an RN full time while pregnant in second or third trimester, and 3) had a position providing direct patient care. The inclusion criteria of working during pregnancy in the last five years was based on recall about pregnancy and changes in healthcare setting that may change occupational hazards (Chin et al., 2017). Those currently pregnant in second or third trimester criteria were included to purposively sample those who were currently pregnant, but

would also have some experience working while pregnant to discuss. Participants were recruited from across the United States in order to sample a variety of experiences. The United States currently has a Pregnancy Discrimination Act and Family Medical Leave Act, but pregnancy still can cause complications for continuing in the workforce (Jackson et al., 2015). There are additional state laws related to accomodations for pregnant workers in 46 states, but these laws do not provide for preventative withdrawal (Department of Labor - Women's Bureau). Participants were recruited via posts on Facebook and Twitter in September and October of 2019. Social media posts invited potential participants to review study information and inclusion criteria, and provide contact information via an online interest survey if they were eligible and interested in participating. Eligible participants then received an email with the consent form that included the three female authors' credentials, as well as the researchers' interest in the topic and purpose of the study, and if the participant was still interested, JR or HD emailed back the potential participant available dates and times for a telephone interview over Zoom (2020). None of the participants were known to the researchers, and the only contact prior to the interview were emails exchanging available times. Each participant was read the consent in its entirety at the start of the interview and verbally consented to the interview and have their interview were recorded. The study was approved by the Institutional Review Board at University of Arizona prior to recruitment.

Data Collection

A semi-structured interview guide was developed by JR and LF. The interview guide was based a literature review of occupational hazards during pregnancy for nurses in order to add occupational hazard & exposure questions to the Centers for Disease Control and Prevention's

Pregnancy Risk Assessment Monitoring System (PRAMS) Phase 8 survey (2016). The interview guide was then reviewed and edited by HD. Participants were asked to describe their experiences working as an RN while pregnant and upon returning to work after pregnancy. Follow-up questions collected information about symptoms at work, any modification they made in their workday, hazards they experienced, and concerns about working as a nurse while pregnant and returning to work. The only differences in the questions were if a participant was still pregnant or had already delivered. The focus of each interview was on the current or most recent pregnancy, but participants with prior pregnancies could discussed experiences if they occurred while working as a nurse. Each interview was recorded and transcribed verbatim. Each participant was compensated with a $30 e-gift card for participating in the study.

Data Analysis

After all 20 interviews were completed, interview transcripts were uploaded and analyzed in Dedoose (2017), a cloud-based qualitative data analysis and management platform. Content analysis was conducted using both a deductive and inductive coding process. *A priori* codes were determined by the interview guide,and inductive codes were added throughout the analysis process (Elo & Kyngas, 2008). The deductive codes were specific to the research question and based on the participants' symptoms at work, workday modifications, hazards and concerns about working while pregnant and returning to work after pregnancy. Each transcript was coded independently by JR and HD, and then each code application was discussed to reach consensus. New inductive codes that emerged throughout the interview process were applied to all transcripts, and no new inductive codes were added for the last six interviews reached. To ensure that inductive codes were saturated across participants, we reviewed a code application chart created by Dedoose that displayed if a specific code was applied to each transcript. All

inductive codes were applied more than 10 times. When all transcripts were both inductively and deductively coded, the codes were categorized, quotes were discussed between JR and HD and major themes were identified. Findings were then discussed and verified with LF.

Trustworthiness of the findings was ensured using the Lincoln and Guba's (1985) criteria for evaluating qualitative research. Credibility was established through the process of analysis triangulation where two researchers (JR and HD) analyzed the data and reached consensus about codes and findings. During each interview, the interviewer would verify topics with the participants and transcription was verified with the recording, to ensure correct understanding. Including RNs who were currently pregnant and RNs who had returned to work after pregnancy employed in multiple settings across the country supported transferability of findings. An audit trail was created to record the step by step process of the data analysis, and emerging themes and findings were discussed among the researchers and consensus was reached, which ensures dependability and confirmability of the findings (Lincoln & Guba, 1985).

Participants

Twenty RNs participated in the study, and no participant withdrew from the study. Four participants were interviewed by JR and 16 participants were interviewed by HD. Interviews lasted between 18 and 48 minutes. Demographics were collected at the time of the interview, five participants were currently pregnant and fifteen had been working while pregnant within the last two years. Participants were all female and between the ages of 23 and 37. Data from participants on what state they lived and worked in, information about other pregnancies and pregnancy outcomes was not collected. Participant demographics can be found in Table 1.

Table 1

Demographic Descriptives of Participants at time of interview (n=20)

	Mean (standard deviation), Range
Age	31 (3), 23-37

Years of experience as an RN	7.15 (2.64), 1-10
Number of pregnancies	2 (1.17), 1-4
	Number in sample (percent of sample)
Shift length	
8 hours	3 (15%)
10 hours	3 (15%)
12 hours	14 (70%)
Shift	
Day shift	14 (70%)
Night shift	6 (30%)
Maternity leave length	
6 weeks	1 (5%)
10 weeks (taken or planned)	4 (20%)
12 weeks (taken or planned)	11 (55%)
13 weeks	2 (10%)
15-16 weeks	2 (10%)
Work settings	
Acute care (ER, ICU, L&D, Med/Surg, OR, Ortho)	15 (75%)
Outpatient care (home health, cancer center, outpatient surgery, wound care)	5 (25%)

Findings

Nurses described experiences and occupational hazards during their pregnancies and subsequent return to work. Barriers and facilitators to avoiding occupational hazards were also described. It is important to note that a barrier or facilitator may function as the opposite in a different situation. For example, participants frequently described helpful coworkers as a facilitator to them avoiding occupational hazards at work; however, some participants described insufficient coworker support and/or staffing as a barrier to avoiding occupational hazards during pregnancy. We will first summarize deductive findings related to experiences, occupational hazards described, facilitators and barriers to avoiding occupational hazards in the

work environment, and consequences of occupational hazards during participant pregnancies as well as their returns to work. Subsequently, we will describe inductive themes that were identified during the coding process.The inductive themes identified were: support, 'supernurse,' and fear.

Pregnancy at work.

The nurse pregnancy experience. Overall, participants did not describe difficulties getting pregnant. Participants described that they felt increased stress and sometimes fear during pregnancy at work due to handling pregnancy symptoms and avoiding occupational hazards that may impact their pregnancy:

> I think the biggest thing is I just didn't want to contract anything. It was almost like, I don't want to go to work because I don't want to take home bugs. Or stick myself with a needle or do anything that could jeopardize myself and my baby's safety and health. I think that was a huge one. And then I would say when you're pregnant, you're tired all the time too. So I remember just being exhausted and triple checking myself because I didn't want to make a mistake either. That was kind of a stressor. And for the most part, I was able to complete patient care. (Participant #2)

This quote from participant #2 describes the additional stress of balancing pregnancy symptoms, trying to avoid occupational hazards that could be harmful to her and her baby, and performing at work as before pregnancy. The pregnancy symptoms that nurses described managing at work included: nausea gravidarum, fatigue, and discomfort from pain and swelling. Nausea gravidarum was addressed by increasing frequency of eating and maintaining hydration, identifying inconspicuous locations for vomiting ahead of time, and utilizing anti-nausea remedies and medications. The majority of participants (n=14) worked 12-hour shifts and described managing their fatigue through scheduling changes (e.g., spreading out shifts rather than working three or more in a row), taking breaks and sitting whenever possible. Participants described seeking assistance from coworkers for physically demanding tasks that were difficult

to complete as their pregnancies progressed (e.g., patient turning), rearranging the physical environment to make it more comfortable (e.g., adjusting height and/or location of patient beds and other supplies), and requesting patient assignments that were less physically demanding whenever possible. None of the participants reported having to leave early from work or having to call in sick.

Occupational hazards during pregnancy. Participants described experiencing hazards and/or avoiding hazards of infectious diseases, imaging, physical tasks (e.g., lifting and performing CPR), cleaning products, patient violence, and giving medications that may cross the placental barrier (e.g., antineoplastic medications). Participants universally stated that they did not receive additional information from their healthcare providers or human resources department about occupational hazards to avoid during pregnancy while working as a nurse. Many of them did research on their own about occupational hazards or talked to coworkers who had previously experienced pregnancy while working as a nurse to know what hazards to avoid and modifications to make. Participants described that some of these hazards were incredibly difficult or impossible to avoid. For example, patients with infectious illnesses that could impact pregnancy were not always identified ahead of time and some instances of patient violence did not happen until the nurse was in the room by herself with the patient. Additionally, not all workplaces were aware of the occupational hazards that could impact pregnancy and were not accommodating to remove this risk. For example, one nurse described having to advocate for a different patient assignment due to the patient's infectious illness diagnosis. Nurses also described that even when they were aware of what to avoid that it was not always feasible because of the impact on patient care.

> I knew there was always a chance of exposure. We try to use standard precautions, but there's always a chance that someone walks in and they have tuberculosis or there's a

> splash or something. So I knew I was always at risk, but I would try my best to do hand washing and the standard precautions and all of that. (Participant #15)

In this example, the nurses described giving a medication that she knew could cross the placental barrier when there was no one else to assist her and she didn't want the patient to have to wait. This was experience was echoed for other potential hazards like giving CPR or assisting with patient movement.

Facilitators and barriers to occupational health during pregnancy. Support from coworkers and supervisors was the most commonly described facilitator to avoding occupational hazards and negative pregnancy outcomes:

> And at the beginning, they were fine. But as I went through my pregnancy, and as the weeks went on, that's when they helped me more. Does that make sense? That's when they were like, 'Oh, let us turn this patient for you.' Or if I had, like I told you, a rough assignment, somebody would switch for me. If it was ... Sometimes you just get the luck of the draw. But so, but I had a lot of coworker support, for sure, with my last one. And I think maybe it was the experience level. (Participant #3)

However, there also were participants who described working in environments where support was lacking or situations where lack of support was a barrier to taking the precautions to protect health during pregnancy:

> But it was difficult and it was very difficult because you're not really supported. If you have these medical issues and with the pregnancy it just makes it that much difficult and then you're under that stress. And I really just think the stress of the job is which caused my blood pressure to go up slightly at the end of the pregnancy because it's fast paced in the OR, it's very busy. (Participant #18)

Participants attributed the lack of support to lack of awareness about occupational hazards and their potential impact on pregnancy, and lack of resources (e.g., staffing) in the work environment.

Barriers to occupational health and safety during pregnancy included: the work environment, the demands of nursing, and nursing culture. The work environment includes many potential occupational hazards (e.g., tubing/cords, layout of units, and patient rooms):

> There was one time I was in the c-section room that I tripped on a wire and fell early in pregnancy. I think it was around week 12. Everything was fine, and then at week 33 or 34, I actually had a patient that I was getting up after she was delivered to the bathroom. She fainted and fell onto my stomach, which did cause me to contract for about five or six hours, and the baby's heart rate to go up for a couple of hours. I think I only worked maybe two more days after that. It must have been 34 weeks, because I only worked two more days after that, and they said, "That was it. We're done." (Participant #5)

While these same environmental hazards exist every day in the work environment, the impact of these risks during pregnancy can be consequential to the baby as well as the mother's health. Similiarly, some of the demands of nursing may have different consequences during pregnancy. For example, caring for a patient receiving care for a fetal demise during pregnancy may have different psychological consequences for a nurse who is pregnant than a non-pregnant nurse. Some of the job demands (e.g., administration of certain medications or performing CPR) can prove to be difficult to avoid during pregnancy:

> But what it came down to is I had to have my OB/GYN basically say that I could not perform CPR and that's how I got off the floor. Because any other way they were just like, "Oh well, we can't give you a lifting restriction or something to that extent", but you have to be CPR certified and if I can't do CPR then I can't work. (Participant #20)

This leaves nurses in a difficult position since they can perform the majority of job duties during pregnancy, but may have specific duties that they should not perform for their own and the baby's health and safety. Participants described that there was a disconnect between wanting to protect their pregnancy and caring for their patients and completing nursing tasks as they normally would:

> So it was just me and I was 36, 37 weeks pregnant, pushing a stretcher with a pregnant woman down the hall through two doors and rushing to get something done, or an emergency, and patient after patient, and cleaning. In that pregnancy, my second

> pregnancy, I was a little more worried about the sprays and the solutions because we were the ones that would clean all of the rooms. But there was nothing I could do, I had to get it done. I had to clean the stretcher for the next patient and there was no one to step in so I had to get it done. I knew that, well, pregnancy isn't a disability, but I felt like maybe there was more staff maybe that could step in and try to help. It wasn't really there. (Participant #15)

In these situations, like the situation described by Participant #15, nurses did whatever was necessary for patient care, even if they were worried about the possible consequences for their pregnancy.

Consequences. Participants described being diagnosed with gestational diabetes, having to go on bedrest, preterm labor, and miscarriages. The goal of this study was not to identify a causal link between occupational hazards and these health consequences; however, several participants described that some of these conditions may have been exacerbated by working:

> I did have a miscarriage between my first and second and that was... I think it was very early, like I just found out like a week or two before. And I was working that day on a telemetry floor and I just started bleeding. And I thought, well probably just a little bit from the pregnancy, it's new. But then it was a lot and then started cramping. And then I talked to one of the managers and I said this was... Yeah, this was before I had my second. And, she actually immediately got me a wheelchair and took me down to the ER. She's like, 'Just to be safe go get checked out, we'll handle the assignments.' So it was a very stressful and scary time, but I felt that she was able to kind of take me out of that and figure out the staffing because I just left four patients up there with no nurse. (Participant #4)

Additionally, some participants described that they still did not know if their baby was impacted by their work as a nurse during pregnancy:

> So we have harsh cleaning agents that we use in the OR to clean after every procedure. You have to just in fact. So I'm sure there's some exposure to those cleaning agents repeatedly. Yeah. But other than that I had a healthy pregnancy. My daughter's so far is healthy so that's fine. But it said caused the stress to my body. I think physically it took a toll and you know, that contributed to me having to have a C section and go in slightly early. (Participant #18)

This shows that the stress and fear that nurses have about the possible consequences of their occupational hazards experienced during their pregnancy continued even after the birth of their child. Nurses experienced additional occupational hazards upon their return to work and worried about the impact of those on their newborn.

Returning to work.

The returning to work experience. Participants overall described going back to work as "hard" initially from both an emotional and physical perspective, but that they were able to get back in the rhythm. In response to being asked about their experiences returning to work, the most common topic that respondents brought up was breastfeeding and pumping while working. Many described anxiety around being able to pump at work related to both not being able to take the breaks required and worry about the physical environment for pumping:

> Even though my baby's almost six months now, I still feel bad leaving him for such long hours. But being a breastfeeding mom, I have to go and pump, and there are some people who make you feel bad for having to go and leave the floor to pump for half an hour. I only pump once in a 12 hour period, when usually I'm at home, then I'll feed the baby every three or four hours, but I only pump once during the day. And we don't have a room at work where we can pump, so I have to go sit in a bathroom where I can pump. And so that part's the most awkward part about being back at work, is the pumping. (Participant #9)

While some participants described having somewhere private nearby to pump, the majority described the facilities for pumping as being distant, not private and/or not well equipped (e.g., having a nearby fridge and/or sink).

Occupational hazards. Participants described stress/fears about exposures to contagious illnesses that could be passed along to their infants at home and administering medications that could be transferred to the infant during breastfeeding and pumping:

> We do have to administer some cervical ripening medication, and I know I had, even after, postpartum, I was still administering this medication. Then it wasn't until recently they sent out a letter to make sure you're double gloving, and if you are pregnant or still

> breastfeeding, to not be administering this medication or wear chemo gloves I guess […] I mean I wore my typical gloves, but I'm pretty sure there were signs that said double glove, but nobody does. And then we had a big email come out recently about wearing specific gloves when you're administering Cytotec and if you are pregnant, to see if maybe somebody else can administer it for you. (Participant #14)

Participant #14's experience with changing awareness and policies regarding the possible negative impact of medications on those pregnant and breastfeeding was not unique and shows that the occupational hazards experienced by nurses and their impact pregnancy are not completely known. This means that awareness and policies are often changing while nurses are pregnant and breastfeeding.

Facilitators and barriers to returning to work. Participants described that coworker support was crucial during their return to work, especially for taking breaks for pumping. Some participants described feeling supported by coworkers to continue pumping while others did not feel positively supported:

> One of my big fears was pumping at work. As a nurse, things can happen so quickly and the pace can change. Even to this day, I don't get to pump as often as I want or as much as I want or when I am pumping it's kind of shortened because of things I have to get back to. Or whenever I asked like another coworker to watch my patients, I can pump. Sometimes I get flack for it. Sometimes I get that they're annoyed that I ask. So that kind of sucks. So that really made my anxiety go through the roof. Just not feeling like I had that support of being able to pump for my baby. And I feel like even though there are laws saying that they have to give me that time, I just don't feel like it is very well accepted. (Participant #10)

Coworker support was often the described as a deciding factor in how long participants decided to continue to breastfeeding and/or pumping.

Participants also described that having easier patient assignments upon their return to work, adjusting their schedule and number of hours if able, and being able to take maternity leave were all supportive factors that eased their transition back to work. However, not everyone had these supports:

> They don't have paid maternity leave. So it has been very tough actually going back because my little one is so attached to me. She only wants to nurse, she doesn't take bottles. So I've been working night shift instead of day shift. So I had to switch that time at work while she's sleeping. I can care for her during the day. (Participant #11)

Many participants cited these return to work modifications as key to their success or as modifications that would have been ideal.

Participants also described how their home situation impacted their return to work experienes. For example, many participants described that financial constraint was a key factor in how soon after giving birth they returned to work. Additionally support from partners and other friends and family were described as key to their successful transition back to work:

> Nurses are doers and we're not used to sitting still and we're at home with an infant that we don't know how to take care of and didn't have any really support from friends and stuff. I think that the isolation of it makes it even more challenging. This isn't from a personal perspective, but it's just a generalization that I have. I really think that we need to support each other more, watch for postpartum depression, postpartum anxiety in our coworkers, especially when they come back. We just need to be nicer to each other and sometimes we're not in this field. (Participant #1)

Multiple participants described the need for screening and support to address postpartum depression as something that would have improved their experience returning to work.

Consequences of experiences. Participants who had experienced multiple pregnancies as a nurse often described how their experiences during and returning from each pregnancy impacted how long they stayed in a position. The common themes across participants who transitioned positions between pregnancies were lack of support, and inability to modify tasks or avoid occupational hazards in the workplace:

> Even though I was pregnant [for the first time], they would still be putting me on these floors that required a lot of lifting, like the ortho floor and whatnot. So I felt... They didn't confirm or deny that all of, just the work in general, the lifting and the moving, contributed to the preterm labor. Hard Telling, but in my mind I felt like it did, because I just felt a lot more like my body was just constantly pushing, pushing, pushing to do more and wasn't hydrating enough, eating... But who knows. And the second two pregnancies I felt more supported. I felt that I was being acknowledged, that, "Okay these

> certain things aren't okay." And everyone didn't seem to have a problem with it. Or if they did, I guess they didn't say anything. But I felt like, when they could help, they would. (Participant #4)

Participants who had changed positions between pregnancies reported positive experiences during subsequent pregnancies.

Support.

Participants frequently described the needed support from coworkers and managers in order to make modifications and avoid occupational exposures during pregnancy. The dimensions of support that we identified inductively were: 1) a pattern to support throughout pregnancy and returning to work, 2) participants described the need for emotional support in addition to support with completing work tasks, and 3) financial support or resources for maternity leave. Participants described having the most support when they were visibility pregnant and needed more support when they returned to work (and often needed support for work modifications for breastfeeding).

> But where I work, we have a lot of seasoned nurses who've been around a long time. So, they were very more up to understanding, "Oh, this person is going to go through alcohol withdrawal. We'll keep an eye on you and your patient, if they get too out of control, we'll switch you." So, they're definitely more aware of how patients could be, and ... Or doing CPR, I had to start CPR on somebody. And one of my providers jumped in and was like, "No, you can't do CPR." (Participant #2)

Participants described the emotional difficulty of returning to work and the need for emotional support from coworkers, managers and social supporters outside of work. Participants did not describe postpartum depression, but suggested that nurses should look out for the associated symptoms in each other. When describing maternity leave, the determining factor in length of leave was the financial support for leave. Specifically, if the participant had paid maternity leave or short term disability insurance through work or the financial means to not work during family

medical leave act (FMLA) leave. FMLA is a US law that provides some employee groups with up to 12 weeks of unpaid, job-protected leave per year that can be used for birth of a child. While some participants described having the support to transition back to full-time work slower or part-time work instead, for the majority financial support was the determining factor in length of leave. Nurses described not wanting to start their FMLA leave prior to their child's birth, so they worked right up to birth whenever possible which often led to situations where they had to work through hazards and did not receive needed modifications.

'Supernurse.'

While participants realized that there were some limitations that they had due to pregnancy or breastfeeding, participants described that they felt the need to continue working and providing patient care regardless of what the consequences may be for themselves or their babies. Participants were resilient in the face of pregnancy symptoms, occupational hazards, and sometimes a lack of support or modifications either by choice or because the culture of nursing disencouraged it.

> As far as modifications that would've helped me, basically asking more for help, asking more for, "Hey, rather than me turning this patient with an epidural who's 300 pounds, can somebody come help me?" Because you do feel that after a shift. You do. My back's sore, my hips are sore, I contract. So I kind of attend to it later. When I get home, I'll lie down and try to drink water. That type of thing. (Participant #13)

We entitled this theme 'supernurse' due to the similarities between the desire described by our participants to put their patients' needs above their own and that their ability to perform regardless of pregnancy or postpartum status as a badge of honor as those described by Steege & Rainbow (2017). Participants described feeling guilty for patients having to wait for care (e.g., medications or assistance with physical needs) due to their nurse's pregnancy status that impacted the nurses' ability to complete the task. This guilt led participants to complete tasks

that they knew could expose them to occupational hazards during pregnancy or breastfeeding. This need to be a 'supernurse' often led to fear about the potential consequences.

Fear.

When describing occupational hazards that they experienced or sought to avoid during pregnancy or upon return to work, participants described fear of both known and unknown hazards. Participants often described their experiences and not knowing if there would be an impact of occupational hazards on their child.

> Just we have a lot of patients nowadays that come in intoxicated, on drugs. And they're very violent. And a huge concern was because my very first one, my placenta tore. And I didn't want to be kicked, or hurt while being pregnant. That was a huge fear of mine. (Participant #3)

For some participants, changes in what is known about occupational hazards and exposures during pregnancy caused fear, specifically when longstanding policies were changed due to new research. This made participants worry that there many be consequences of their work as a nurse on the child.

Discussion

This study sought to explore the occupational hazards and experiences of US nurses working in direct care roles during pregnancy and their subsequent return to work. Through qualitative interviews, we were able to deductively identify occupational hazards that nurses experienced during their pregnancies and return to work postpartum. Inductively, we found that nurses often lacked the support to avoid occupational hazards and make necessary modifications. This led to them to be 'supernurses' and put the patient first even when it meant taking risks for our health and that of their child, which then led them to fear consequences of occupational exposures. The resilience of nurses in light of occupational hazards, barriers to addressing them,

and consequences for their pregnancies and return to work was encouraging, but also revealed areas where healthcare systems and policies could be to improved to minimize occupational exposures and potentially negative pregnancy and safety outcomes.

Healthcare systems can utilize the Hierarchy of Controls for Safety and Health of employees to address the occupational hazards and minimize exposures for pregnant employees. The Hierarchy of Controls for Safety and Health of Employees encourages employers to identify workplace hazards and exposures, identify controls to eliminate or control all serious hazards, and develop and implement a plan and follow-up to ensure that the plan is effective (OSHA, 2016). In the case of exposures and hazards experienced by nurses during pregnancy, participants in our study described that there was not information about hazards, exposures and controls provided to them by their work environments. Futhermore, their obstetric health providers and Human Resources Departments did not provide education about possible hazards and/or exposures that nurses may face that are known to have possible negative consequences for the health of both the mother and baby. Participants described finding this information on their own or learning from co-workers who had experience with working as a nurse during pregnancy. This is an oversight in education that should be addressed by both workplaces and maternal care providers in order to improve the health and safety at nurses working during pregnancy. In Switzerland, Abderhalden-Zelleger and colleagues (2021; 2020) found that obstretic providers and employers practices are not fully aligned with ordinances to reduce risks of working during pregnancy and that training could be a helpful intervention to improve application of laws to protect pregnant and postpartum workers.

Employers should be motivated to improve their education and processes surrounding nurse health at work, especially during pregnancy, as they often are responsible for healthcare

and worker injury insurance for nurses in the United States; and therefore, would incur higher costs related to occupational hazards and exposures (Troy & Wilson, 2014). Based on participant responses in this study, we hypothesize that nurses do leave organizations or positions that they felt did not minimize occupational exposures and/or provide adequate support during their pregnancies and return to work. Given the cost of nurse turnover, which is estimated to be between $22,000 to $64,000 per nurse in the United States (Jones & Gates, 2007), this is an incentive for organizations to address occupational safety and health of pregnant nurses. In the United States, healthcare systems have been slow to enact evidence-based controls to monitor, address, and change culture around occupational hazards and exposures (e.g., nurse fatigue) (OSHA, 2015; Steege et al., 2017a, 2017b).

Occupational health and safety governmental agencies should seek to create and enforce policies that require healthcare work environments to study and address occupational safety health of nurses and other healthcare workers during pregnancy. In Quebec, the Act respecting Occupational Health and Safety supports the preventative withdrawal with compensation for a pregnant or breastfeeding worker if an employer cannot eliminate the hazards, adapt the employee's position or reassign the worker. Gravel et al. (2017) studied the impact of this law and found that it protects health, but still requires employer commitment to make sure undue burden is not placed on other employees. In the United States, state and federal laws do not require compensation for employees whose workplaces are unable to make accommodations. This means that pregnant or breastfeeding employees who are unable to get the needed accomodations have the options of either unpaid time off work, quitting their position, or continuing to work with the hazards. Participants in our study describing relying on coworker support to avoid occupational hazards. For example, nurses were aware of some medications that

may have a negative impact on their developing baby; however, participants described that even when they sought to avoid these hazards, their ability to do so was very dependent upon having co-workers who could step-in and administer the medication. When they did not have a co-worker who could help, participants described administering the medication themselves while knowing the risks because they did not want the patient care to be impacted by their pregnancy and the lack of co-worker support on the unit. Since accomodations and additional staffing cost organizations money and there are not laws that require organizations to accommodate pregnant employees, organizations in the US are not currently incentivized to address hazards and reassign employees, so pregnant employees count on support from others.

Workplace pregnancy presents an opportunity for strained relations between coworkers and supervisors (Fritz et al., 2006). Some of causes of strain identified in this study include: seeking modifications during pregnancy to avoid hazards; taking parental leave, often when there was a shortage of staff; and seeking accomodations upon return to work for breastfeeding. Nurses are a historically oppressed group due to the hierarchy within many practice settings and that the majority identify as female, but being a traditionally oppressed group has also led to oppression of other nurses with horizontal and vertical violence (Rooddehghan et al., 2015). Pregnant and breastfeeding employees are a vulnerable population and efforts to correct the equity of experiences between pregnant and non-pregnant and employees of all genders should be made.

Nurses viewed support from supervisors, co-workers, and their partners as key to their success during pregnancy and upon returning to work. The support was both physical support in terms of assistance with moving patients or switching assignments as well as emotional support such as the compassionate attitude and interaction with supervisors and co-workers as they

checked in on the participant's well-being. The support from supervisors and co-workers may increase the participant's resilience and ability to work through the pregnancy and returning to work. Lack of support from supervisors and co-workers affected the participants both physically and mentally. They experienced more fatigue and some atributed lack of support to feeling depressed during pregnancy and postpartum. Support of the nurse is an important concept for the health and wellbeing of nurses, and may be especially important during pregnancy and postpartum returning to work (Sheffield, 2018). Laws like those in Quebec that provide for preventative withdrawal can act as a model for improving the occupational health and safety of pregnant and breastfeeding nurses and incentivizing workplaces to make needed changes to protect these workers.

Even in work settings and situations that potentially compromised the health of pregnant nurses, participants were resilient. The concept of resilience is understood as the ability to successfully cope with stress, negative experiences, and hardship and remain optimistic and adapt to the current situation (Hart et al., 2014; Tusaie & Dyer, 2004). Despite suffering from nausea and fatigue the participants worked their full shifts and cared for patients as they did prior to their pregnancy. The participants planned around their pregnancy symptoms, such as having places to vomit and the ability to hydrate and eat small snacks. Only when a participant was diagnosed with pregnancy complications and was ordered by a physician to modify their work did some of the participants reduce assignments or practice bedrest at the end of the pregnancy. While the participants in this study may reflect RNs who were able to work during pregnancy these findings highlights the resilient nature of the nurse. The participants were able to work full shifts while managing their pregnancy symptoms in addition to caring for their families at home. This resilience was also evident when the participants returned to work, where they had small

infants at home, were mostly breastfeeding and able to provide patient care. This resilience was not directly discussed by the participants, but emerged as a strong undercurrent of these participants' experiences. New research findings suggest that resilience may be a protective factor of mental health in pregnant women (Xuemei et al., 2019). However, challenging workplaces and work environment where nurses perceive their workplace as not caring about them personally can deplete nurses' psychological reserve, threaten their resilience, and lead to burn-out (Hart et al., 2014). How resilience may be a protective factor in pregnant nurses and how their work environment might affect their resilience should be further explored. As should the role of work environments in protecting their workers.

Limitations. It is important to acknowledge the limitations of this study. The convenience sampling through social media could result in bias with recruitment of RNs who have been able to work during their pregnancy and return to work. The sample did not include RNs who may not have been able to work as an RN during pregnancy and/or return to work or who did not achieve pregnancy. This sampling strategy may also over sample individuals who had difficult pregnancies or challenges while working and who want to share their experience. We chose this sampling strategy rather than snowball sampling in order to sample nurses with a wide range of experiences and from different work settings and locations rather than from one organization or location. The qualitative descriptive methodology was appropriate for this study of a phenomenon where little is known. However, this method as well as the content analysis did not allow for deeper examination of meaning or underlying beliefs. For example, the participants would often say that they did not make any modifications in their work during their pregnancy, but then later in the interview state modifications such as changes in scheduling. The method did not allow us to further examine this cognitive dissonance, which must be further explored in

future studies. The findings from this study emerged from a smaller sample size, and concepts must be further explored quantitatively and in longitudinal studies to determine health outcomes for nurses working during pregnancy.

Interviews were conducted between September and November of 2019. The findings reflect occupational hazards that pregnant nurses experienced prior to the COVID-19 pandemic. However, the occupational hazards that pregnant nurses currently experience during the COVID-19 pandemic may be exacerbating prior issues in pregnant nurse health, making this issue even more urgent.

Conclusions

Occupational hazards experienced by nurses during pregnancy that may impact their health and that of their baby were broader than previously studied. Additionally, nurses did not receive educational information or modifications to avoid known occupational hazards. Future work should focus on assessing the prevalence of these hazards, the exposure that can lead to negative consequences for nurse and fetal health, and reducing the risk of exposure to these hazards for pregnant nurses.

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