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Occupational Hazards and Risks Faced by Chinese Immigrant Restaurant Workers

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Historically, Chinese immigrants to the United States have worked in restaurants to support their families. Hazards and risks associated with this population's work in restaurants are underrepresented in the literature. This ethnographic study used interviews, participant-observations, and follow-up focus sessions with 18 immigrants from China, Hong Kong, and Taiwan to identify potential physical, biological, enviromechanical, chemical, and psychosocial hazards that they face. Psychosocial hazards were most often mentioned by the participants; biological hazards were not identified in the data. Practice and research implications for addressing health disparities in this population are discussed. **Key words:** *Chinese immigrants*, *health disparities*, *occupational hazards in restaurants*, *qualitative*, *restaurant workers*

IMMIGRANTS provide a major source of labor in the United States; yet, often, they work in undesirable and dangerous jobs. Frequently, risks related to their work are compounded by hazards in their homes and their communities.[1] The literature is replete with studies on disparities in physical or mental health[2]; however, few studies examine disparities in occupational hazard exposures and health.[3] Dembe's review of international studies shows that immigrant workers have higher rates of occupational accidents than do native workers in their receiving country.[3] This article describes occupational hazards and risks that Chinese immigrant restaurant workers face and discusses implications for health disparities in Chinese immigrants.

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BACKGROUND

Chinese immigrant workers

Chinese arrived in the United States in the 1850s, the first of the early Asian immigrants to arrive in large numbers.[4] In 2000, 26% of the 31 million Asian immigrants to the United States were Chinese.[5,6] Historical discriminatory laws prohibited Chinese from working in government and different industries to avoid being in economic competition with White-Americans. In response, Chinese developed businesses such as Chinese restaurants and laundries that had no direct competition with White-American enterprises.[4,7] As discrimination against the Chinese diminished, new generations participated in a wider range of employment sectors. Restaurants, however,

continue to provide economic survival for Chinese immigrants in the United States.[7]

The restaurant industry

As of 2006, the restaurant industry is the largest private employment sector in the United States, employing an estimated 12.5 million people and expected to add 1.9 million jobs by 2016.[8] Most restaurant businesses are small, with 72% employing fewer than 20 workers.[9] Lower skilled workers represent the largest segment of the employees in this industry; in 2004, 22.5% were counter workers, 21.4% waitpersons, 17.6% cooks, 4.8% food preparation workers, 4.4% dishwashers, 3.2% cashiers, and 3.2% host persons. Median hourly earnings range from $11.84 for first-line supervisors or managers of food preparation and serving workers to $6.71 for waitpersons, which generally are lower than the average for all industries.[9]

Restaurant occupational hazards

Hazards associated with restaurant work have been described and categorized in the literature as physical, chemical, biological, enviromechanical, and psychosocial.[10,11] *Physical hazards* refer to agents that cause tissue trauma through energy transfer. Hot oils, hot water, steam, hot liquids, fryers, grills, and flame are the most common physical hazards, causing burns among restaurant workers.[12,13] Food preparation or handling workers, such as cooks and food counter workers, are reported to be at a higher risk for occupational burns.[12]

Chemical hazards are chemical agents that interact with body tissues and cells, potentially causing toxicity or irritation. They may be contained in cleaning solutions, gases, or fumes. Cooking fumes in particular—fumes from heated oils and cooking of meat and fat—are most documented in the literature. Harmful byproducts of degradation, including carcinogens and mutagens, are found in fumes when foods are prepared under high temperature.[14] Studies have determined that increased exposure to cooking fumes increases the risk of lung cancer,[15] cervical cancer,[16] and respiratory symptoms.[17]

Biological hazards include infectious or biological agents transmitted between individuals via air, droplets, or contact. Foodborne organisms such as norovirus, salmonella, and hepatitis A virus are transmissible through improperly stored or prepared food.[18,19] Biological hazard reports most often focus on consumers' food safety, with restaurant workers mentioned because of their role in food handling, rather than because of their own exposure to the hazard.[19]

Enviromechanical hazards include such factors as poor equipment, slippery floors, environmental tobacco smoke (ETS), and repetitive motions that cause accidents, injuries, discomfort, or illness. ETS is the most documented enviromechanical hazard for restaurant workers, with exposures 1.6 to 2.0 times higher than in office workers and at least 1.5 times higher than in persons with only domestic ETS exposure.[20] In addition to its associations with pulmonary and cardiovascular diseases, tobacco smoke may interact with workplace toxins and increase health risks associated with tobacco smoke.[21] Slippery floors caused by ice, water, grease, sauce, or powder are a commonly reported hazard for falls, sprains, strains, cuts, contusions, and burns.[22,23] Some studies examining the physical demands involved in food services found musculoskeletal discomfort among waitpersons required to lift and carry heavy trays.[24]

Psychosocial hazards are work-related situations that create stress, emotional strain, or interpersonal problems for workers. In comparison to other restaurant hazards, this is the least studied area of hazards. According to the US Department of Labor,[9] kitchen workers may experience stress from working in close quarters, near hot ovens and grills, and from standing for long periods of time. During peak dining hours, cooks and waitpersons are under pressure to work quickly to prepare orders and serve meals. High-business volume increases workers' stress and the probability of injury such as muscle strain from trying to lift a tray without proper precautions.[9]

Assaults are another psychosocial hazard. A worker's compensation claims study found that 12 of 63 work-related rape cases were associated with food and drinking establishments. Because compensation claims identify assaults only if they result in lost workdays or medical treatment, sexual assault may be an underreported hazard for female workers.[25]

DESCRIPTION OF THE STUDY

Design

This ethnographic study was conducted in 2004–2006 in metropolitan Washington State. Ethnography provides a means to explore human experience in a particular sociocultural setting through a range of research techniques and data sources.[26] The primary data sources were personal interviews and participant-observations (POs), 2 techniques drawn from the ethnographic methodology.[27] Follow-up focus sessions were used to validate the information derived from these two data sources. In keeping with human subjects' protocol, prior to all data collection, participants were provided with a complete explanation of the study and answers to questions about procedures. Written consent to participate was obtained.

Sample

Participants fulfilled the following criteria: (1) foreign-born Chinese, (2) aged 18 or older, (3) Mandarin (Chinese) or English speaking, and (4) at least 6 months' work experience in restaurants. The 6-month time frame was selected on the basis of the principal investigator's (PI's) research experiences with immigrants that they generally begin to understand their surroundings after living in a new environment for 6 months.[28] Six months was deemed adequate for participants to understand their work environment and make meaningful contributions. Eighteen workers were recruited, primarily through referral from local Chinese associations, the PI's social networks, and the research assistant's (RA's) contacts through interpreter services. Participants were from China ($n = 9$), Hong Kong ($n = 4$), or Taiwan ($n = 5$). All arrived in the United States between 1970 and 2002; their average length of stay in the United States at the time of interview was 14.7 years (SD = 9.9). Eight were female, and the mean age of all participants was 48.8 years (SD = 13.5). All were educated in their home countries, with education ranging from less than seventh grade to 4 years of university education. The years of working in restaurants at the time of the interview ranged from 10 months to 25 years ($M = 6.3$ years, SD = 7.6). All worked in full-service restaurants, mainly Chinese restaurants. Other establishments in which they had worked included fast-food Asian restaurants ($n = 2$), food court ($n = 1$), Italian restaurant ($n = 1$), and Japanese restaurant ($n = 1$). Three participants had worked only in non-Chinese restaurants: American, Greek, and Pan-Asian. Their roles included busperson, waitperson, cashier, dishwasher, food preparation assistant, cook, and restaurant owner. Eight reported more than 2 roles.

Data generation

Personal interviews consisted of completion of a Demographic and Immigration Questionnaire (DIQ), followed by a semistructured interview. The DIQ, a 28-item questionnaire,[28] collected participants' demographic and immigration background information (eg, immigration mechanism, year of entry) and took about 15 minutes to complete. The interviews, lasting for 60 to 90 minutes, focused on occupational experiences and perceptions of hazards and risks. A total of 21 interviews were conducted by the PI (proficient in Mandarin) or the RA (proficient in Mandarin and Cantonese); 3 of these were second interviews. All but one interview was tape recorded (with approval); the other was recorded in note form. Recruitment for this phase of the study was stopped because of saturation.

During the interview phase, POs were also conducted in 8 Chinese-owned restaurants during lunch or dinner hours. This technique

enabled the researchers to collect context information that resulted in the generation of new interview questions.[29] Observation categories included size and physical features of the restaurant, characteristics of the workers and customers, job structure and content, and workers' interactions with managers, coworkers, and customers. Data from the PI's observations, listening, and natural conversations were recorded as field notes. No study participants were in the restaurants during the PI's visit.

Once the interviews and PO data were analyzed, 4 *focus sessions* were conducted with 10 of the 18 interview participants to further validate the findings. Each session was limited to 4 participants to increase opportunities for more in-depth exploration and to avoid data loss due to transcribing and translation difficulties and time limitations.[30] Ultimately, because of scheduling difficulties, each session had 2 to 3 participants. The sessions, lasting for 1.5 to 2 hours, were conducted by the PI (facilitator) and the RA (moderator) in a private room. A list of hazards derived from the analysis of the interview and PO data was posed for discussions in each focus session. The list was updated for the following session. No new information was added after the third session.

Data analysis and trustworthiness

Descriptive statistics were used to summarize the DIQ data. For the interview data, interviews were transcribed (in Mandarin) by the RA, and 4 random transcripts were checked by the PI. No serious errors were identified. Most of the errors were associated with participants' accent or use of colloquialism and were then corrected for analysis. Using the principles of ethnographic content analysis,[31] the PI read each transcript and highlighted content significant and relevant to the study aims. The occupational hazard categories and definitions described in the "Background" section were used for the findings reported in this article. The codes and data were entered into ATLAS.ti[32] (which can read Mandarin texts) for data retrieval and reorganization.

In addition to checking transcript accuracy as part of trustworthiness assurance, the findings of preliminary analyses were validated with other participants,[29] or with the same participants in their second interviews, to ensure that the reconstructions of participants' experiences were accurate. Follow-up focus sessions further validated the analysis. Field notes of the POs were reviewed along with the analysis of interview data to seek explanations for questions derived from or interesting patterns observed in the interview data. The PI also had periodic discussions with the RA and the co-PI to ensure that alternative interpretations of the data were considered.

FINDINGS

Four of the 5 categories of occupational health and safety hazards were identified in the data. Biological hazard was not addressed by any participant or observed during the POs.

Psychosocial hazards

Psychosocial hazards were the ones most often mentioned by the participants. Many psychosocial hazards related to business volume (mentioned by all participants). When business was good, the participants were expected to promptly respond to customers' needs and to keep up with the pace. Standing for long periods of time at work was common; the chance of sitting down to rest or having an uninterrupted meal was almost impossible when it was busy. "Sometimes, you just have two bites, you have to get up because customers are coming in and you have to take care of that. Um, I think [it's] a lot of *stress*," said one former waitperson and owner. However, it is also stressful for owners and workers when business is slow. As one former owner said, "When you have business, you're too busy to eat or to even use restroom. When you have no business, you're worried if you have no customers today, what you are going to do

with all the food or that whether you will have business tomorrow." Or as a waitperson stated in a focus session, "When business is good, you only have problems related to the work itself. But when business is not good, then you have to see the boss' face. If you idle, you will be told to do something else. Sometimes you have to carry heavy things; sometimes he asks you to go to the warehouse to put things away." It was not uncommon to hear that waitpersons were sent home because of slow business during their shifts.

The hierarchical worker structure was another common source of stress. Among all workers, cooks were considered most indispensable because owners "need to rely on them to design the menu and to make those dishes," whereas dishwashers and buspersons were most dispensable. Few participants had good experiences with the cooks with whom they had worked. More than half reported that the cooks at their restaurants were bad tempered. As one participant put it, workers usually tolerated their cooks' yelling, scolding, rudeness, or even threats for "survival." When one participant stood up for a waitress, the cook "threatened [her] life with a kitchen knife." In a focus session, another participant mentioned a cook who would "pick up a knife and threaten to chop people when it's busy." They ended up calling the police once for such behavior. Managers or owners, however, were reported to "not dare make a noise" (ie, not complain) because of the indispensability of cooks, particularly if it was the head cook.

Needing to use English for communication with customers, another psychosocial hazard, was particularly stressful to waitpersons. Most participants worked in Chinese restaurants—some located in Chinatown, others outside of Chinatown. Nevertheless, they had to interact with customers who spoke no Mandarin or Cantonese. "['Lau-wai' (usually referring to Caucasians)] ask many questions. They don't know how Chinese food is made and what's inside . . . . I know how to make those foods. But, it's harder to say it in English," said one waitperson. It was not uncommon that waitpersons took menus home to study, and they memorized the menu in Chinese as well as in English when they started their jobs.

Other psychosocial hazards reported by the participants included customers who were drunk, who refused to pay, or who assaulted workers because they were unhappy with the food or the service. Owners or former owners cited stress from interpersonal problems among employees, and their concerns about restaurant safety, in particular when in a high-crime neighborhood. Waitpersons described the pressure to learn quickly of their cook's habits, to maintain a good relationship with hosts, and to avoid billing errors or receiving customers' noncashable checks (which they would then have to pay for).

Physical hazards

Extreme temperature was the primary physical hazard reported by participants. Exposures included hot oil, hot cookware (eg, "oil wok"), and steam from cooking or hot dishes (occurred among cooks, food preparation assistants); hot plates, steam from the dishwasher, and extreme hot water from the sink (among dishwashers); and hot soup or liquid, hot plates, and steam from hot dishes or steamers (among waitpersons). Environmental heat was also a problem, as described by a former owner and cook: "When it's 80 or 100 degrees outside, it's several hundred degrees in [the kitchen]. It's very hard to work in the kitchen everyday . . . especially during the summer."

Cold temperature was also an issue. A focus session participant who was a former waitperson noted, "There are [cooks] who make cold food, like chicken, frozen shrimps. They have to take them out, defrost, and peel the skin. Actually, a lot of times they can easily get 'f eng-shih' (rheumatoid arthritis) because they have to soak [frozen food] in water, clean the stuff, and so forth."

Other physical hazards reported by waitpersons, dishwashers, or buspersons included broken glasses, or dishes causing cuts. One waitperson said, "Every time you finish cleaning, you need to take the cups out of

the dishwasher and put them in a bucket . . . . Sometimes cups break when you have too many of them together. You don't know they're broken. When you go get them, your hand gets cut." Or as a dishwasher stated, "Sometimes cup handles break. Sometimes cups drop in the sink and break." Glasses, according to him, were used less frequently in restaurants and thus were easily left in the dishwasher without notice until "you hear 'pa-la' (sound of breaking glasses) when you're putting away stuff [in the dishwasher]." Although noise from kitchen hoods and heat from stoves were noticed in the POs, no participant mentioned either of these physical hazards.

Enviromechanical hazards

Slippery floors were the most mentioned enviromechanical hazard. One participant stated, she "had to be particularly careful when walking into the kitchen because kitchen was usually wet." Wet kitchen floor was noted during POs; however, cardboard or rubber mats were sometimes used to keep the floor dry.

Repetitive motions from unloading utensils and pushing and pulling dishwasher racks were enviromechanical hazards unique to dishwashers. Heavy lifting was associated with various activities among food preparation assistants or dishwashers. One example related to garbage disposal, as one participant described, "It takes 3 or 4 people to throw away the garbage [everyday]. Ten bins. They have garbage like water, cut-out parts, food used for soup base, and so forth. They're very heavy. We have a cart to push the bins to a big Dumpster. Several of us need to throw them into [the Dumpster] together." POs also noted workers carrying a heavy tray or multiple plates with one arm and one hand. Long hours of using knives to prepare food (eg, slicing meat, shredding vegetables) were mentioned by cooks or food preparation assistants. Repetitive motions from chopping or cutting may also be a potential cause of injuries or illnesses. Improper workstation height was noted by a sushi chef assistant whose workstation was too high for her, eventually causing a serious shoulder problem. Other enviromechanical hazards noted during focus sessions included metal nails on cardboard boxes, tobacco smoke, and use of "ice cream scoop" to scoop hard ice cream (which caused injuries to a coworkers' wrists).

Chemical hazards

Bleach was the chemical hazard most often noted by food preparation assistants, dishwashers, waitpersons, and buspersons. Bleach was used daily to clean floors and to soak towels for table and kitchen counter cleaning. Detergents were used for cleaning stoves: "When I was working in restaurant, [the manager] would tell you that the stuff used to clean the stoves and those dirty things are chemical and would harm your hands. You need to wear gloves and don't let it get into your eyes," said one food preparation assistant. Or as one former owner said, "The most important safety thing about washing dishes is the 'chemical' (in English). 'Chemical' can't mix with food . . . . [The two chemicals are] usually bleach and detergent . . . . [Detergent] is directly delivered from the 'chemical' companies for restaurants. It's stronger [than home-use detergent]. So often you need to tell dishwashers to be careful." Although restaurants use gas for cooking and have fumes from cooking, as observed in the POs, no participants mentioned gases and cooking fumes in the interviews.

DISCUSSION

When residential relocation occurs between countries that differ in languages and customs, immigrants face a series of adjustments and psychosocial responses, such as frustration, embarrassment, nervousness, sense of hindrance, and social isolation during resettlement.[28,33] As found in the literature and the authors' experiences with immigrant groups, these psychosocial responses can lead to serious mental health problems

or emotional disorders.[34,35] Findings of this study suggest that an array of physical, enviromechanical, chemical, and psychosocial hazards exist in restaurants where many Chinese work, some threatening physical health and safety and others adversely affecting psychological well-being. In addition to such factors as institutional racism related to job segregation and culturolinguistic differences, to eliminate health disparities and promote the health of Chinese (and other) immigrant workers, work and occupational hazards exposures should be explicitly considered in the health disparities framework.

Work hazards and health risks differ among different positions. Reported research, mainly quantitative studies, suggests that workers involved in food preparation or handling have higher incidents of burns[12] and exposures to cooking fumes.[14,36] Regular exposures to heavy lifting increase the risk of musculoskeletal discomfort for waitpersons.[24] This study presents more detailed evidence for service providers to conduct health and risk assessment and design health education materials and programs tailored to each position.

In addition to health education, protective measures and engineering control are necessary. For instance, rubber mats, as observed in some restaurants, should be used to prevent falls from slippery floors. Effective kitchen hoods and sufficient exhaust systems should be in place to decrease cooking fume exposures.[15,16,36] This is particularly important for Chinese immigrant restaurant workers since, due to language barriers, Chinese immigrants most often work in Chinese restaurants[7] where food preparation involves frying at high temperatures,[15,16] increasing production of cooking fumes. Despite the scientifically known cancer risks, no participant mentioned cooking fumes. Although further investigation with larger samples is needed to identify the factors associated with such observation, this finding still warrants the engineering control approach to protect Chinese immigrants working in restaurant kitchens. Although a risk-based restaurant inspection system is implemented by local health departments, the system is oriented more to customers than to restaurant worker protection.[37] To ensure workers' safety and health, these inspections should also address workers' health and safety by including ventilation inspection, for instance, and worker knowledge assessment for educational interventions.

Psychosocial hazards in restaurants is the least studied area of hazards. These, however, were the most frequently mentioned hazard by participants. This study identified several sources affecting Chinese workers' stress, emotional strain, and interpersonal relationships at work. Studies with large samples and greater diversity in demographics, sources of data (eg, workers' family), and outcome measures are needed for a comprehensive understanding of psychosocial hazards Chinese workers face in restaurants and the effects of these hazards on the health of the workers and of their families. Because workers are simultaneously exposed to multiple hazards, interactions between psychosocial and other hazards are worth investigating. Furthermore, psychosocial hazards are particularly difficult to prevent and alleviate. According to a Bureau of Labor Statistics survey,[38] 44% of occupational stress cases resulted in 31 or more lost workdays, compared with 19% of all injuries and illnesses resulting in the same degree of lost work. For disadvantaged populations such as low-income Chinese immigrants who are working in small businesses, preventing or alleviating these hazards poses more challenges than their counterparts do. Worker advocacy organizations (eg, workers centers, Asian Pacific Islander workers union), service providers, researchers, and Chinese associations ought to work together to continue the effort to understand the world of the Chinese immigrant workers and to determine the precise nature of their psychosocial hazards. This information can then be used to develop strategies to work with employers to reduce psychosocial hazards at their work environment and improve Chinese immigrant workers' lives.

CONCLUSION

Restaurant work has been vital for Chinese immigrants' economic survival in the United States over decades. To our best knowledge, this is the first study focusing on occupational health and work risks of Chinese immigrants in the restaurant industry and adds to the health disparities literature. To better promote Chinese immigrants' health, work and occupational hazards should be explicitly considered in the health disparities framework. The commitment and dedication of providers and organizations from the Chinese communities and the mainstream are critical. Further research examining the sources and effects of occupational hazards on the health of workers and their families is very much needed.

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