Occupational health equity: a call to consider social–structural factors in injury prevention research

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ABSTRACT

Occupational health equity scholarship has been growing over the past decade, including social–structural determinants of health research that centres the voices and experiences of historically marginalised communities. In our commentary, we focus on the intersection of work-related and non-work-related factors and how they impact the health of workers, their families and their communities through community-engaged research. Case studies include the implementation of mobile clinics that are developed alongside communities, community organising to examine and reduce health disparities among racially segregated workers, the development of research instruments and measures to study racism and discrimination, and a focus on how the distribution of employment opportunity is an important point of intervention to eliminate injury disparities.

INTRODUCTION

Despite its historical roots in social medicine, occupational health transformed into a regulatory and technical field in the 20th century, most notably in the USA following the Occupational Safety and Health Act of 1970.[1] Documenting and understanding structural factors driving workplace injuries is fundamental and necessary for the discipline to be effective in promoting occupational safety.[2] Over the past decade, scholars have begun reprioritising the ways that health equity and community-based methodologies can inform and improve occupational health scholarship. In particular, a social–structural determinants of health lens, including historical, political and economic factors, can help explain distributions of workplace injuries.[3] These efforts have highlighted the intersection of work-related and non-work-related experiences, by documenting over-representation of im/migrant workers in dangerous and low-pay jobs and the compounding effects of residential and occupational segregation in driving health disparities.[4 5] Historical and community perspectives have also bolstered the field's evidence base. For example, fatal occupational injury disparity trends in the US south can be more clearly understood by describing them alongside patterns in sanctioned discrimination in education access,[6] displacement of US-born workers of colour by immigrant workers,[7] union-weakening state policies[8] and informal and unregulated im/migrant work networks.[9] Additional work has identified poverty as a key driver of substance misuse.[10] In spite of these developments in the literature, there is still limited analysis of the roles of social and structural factors in workplace safety. Therefore, to address these challenges and offer solutions, we discuss four occupational health research projects and how centring participatory and action-oriented research improved the lives of workers, their families and their communities.

Case study 1: docside clinic: connecting docs to docks

For more than two decades, shrimp fishing has been one of the most dangerous and deadliest occupations in the USA.[11] It has an occupational fatality rate nearly 40X the national average and employs many im/migrant, ageing and low-income workers.[12] To address their risk of occupational injury, our team conducted community-based participatory research (CBPR) with Gulf Coast fishermen, which is a relational model that values participants as equal partners in planning, disseminating and implementing research. Consistent with CBPR, community members who are part of the commercial fishing industry assisted our team in developing research questions, our team brought initial results and analysis back to the community to correct misinterpretations, and then an intervention was developed based on the needs identified by the fishermen. Of interest were the ways that participants understood their injuries, the risks they faced on-the-job and their ideas for improving their health. Workers were engaged throughout data collection and analysis, and they played a significant role in moving the findings into actionable change.

Based on our findings, we developed, maintained, implemented and tested the feasibility and effectiveness of the *docside clinic: connecting docs to the docks* to address commercial fishermen's access to healthcare, food and immigration needs, which impacts their work and home life.[13] The programme was initially implemented at one location in July 2021 and has now expanded to two locations. We have had over 1000 patient encounters and provided access to medical and social services that commercial fishermen requested, such as diabetes and blood pressure screenings, antibiotics, influenza kits, dental exams COVID, influenza and tetanus vaccines, as well as food, clothing, opioid antagonists and immigration services. Applying CBPR methods to a high-risk occupational setting allowed us to examine the bidirectional relationship between work-related injuries (eg, sleep deprivation) and non-work determinants of health (eg, immigration status), particularly for a population

that faces dangerous working conditions, has limited sick leave benefits and lacks preventive healthcare access.

Case study 2: occupational segregation in an aluminium company town

Badin, North Carolina is a company town, meaning that the employer owned and established housing and public resources. Established in 1916, Badin was home to one of the nation's first aluminium smelting facilities, which extract aluminium from refined alumina through an electrolytic melting process in 1700° baths. The facility shut down in 2007, but the plant buildings and waste remain. Residences and jobs in Badin were racially segregated, and the smelter and its dumping sites are in West Badin, the Black side of town. Our team conducted collaborative research with the Concerned Citizens of West Badin Community (CCWBC) and the North Carolina Environmental Justice Network in Badin, North Carolina to document structural racism and how it was manifested in people's health. The CCWBC is a community organisation that was formed to advocate for community rights and industrial waste cleanup.[14] The group has raised former workers' reports and concerns that the worst jobs were assigned to black workers and that many members of their community died early.[15]

Since 2016, our team has documented occupational segregation by examining disparities in job assignment and trajectory in four domains: (1) a prestige measure from the sociology literature, (2) wage, (3) particulate matter exposure based on a job-exposure matrix and (4) a danger rank assigned by CCWBC members. Workers identified jobs in the potroom, a room that houses the baths where the melting takes place, as the most dangerous. In all domains, black workers were most likely to be hired into undesirable jobs and stay in them throughout their tenure.[16] Furthermore, inspired by concerns about mortality in the community, and using union records, our team found excess respiratory cancer mortality among plant workers compared with the general population. We also found that potroom workers had higher respiratory cancer mortality rates than other Badin workers.[17] Taken together, our community-based work validated community concerns and lived experiences in an environment of company-influenced narratives and reductive scientific literature that largely overlooked the CCWBC's voices.

Case study 3: fatal occupational surveillance

In the 1980s, North Carolina was largely a rural state although one with large textile and furniture manufacturing industries. Work in North Carolina has dramatically changed since then. Today, North Carolina is the ninth most populous state in the country with an economy centred on financial services, technology and biological sciences. However, the proportion of the state's population employed in manufacturing remains among the nation's largest, female and minority participation in the labour force is high, and organisational capacity of labour is very low. We have worked with the state's medical examiners, and labour and social advocacy organisations, to investigate the circumstances of fatal occupational injuries in North Carolina for nearly two decades.[18] Our approach allowed us to estimate racial/ethnic disparities attributable to workforce segregation, such that black and Hispanic workers generally work in different industries and occupations than white workers, and that attributable to racial/ethnic differences in task assignments and hazards within industries and occupations. We found that if Hispanic workers experienced the workplace safety of their non-Hispanic counterparts, fatal injury rates would be substantially reduced.[19] The research points to root causes, like segregation of the NC Hispanic workforce into the most dangerous industries, as important points for intervention to eliminate injury disparities.[20]

Case study 4: training the next generation of culturally responsive occupational injury prevention researchers

Training future occupational injury prevention researchers to adopt culturally responsive, community-engaged research methods is essential for studying challenging topics, such as racism and stress in socially vulnerable and marginalised working populations. Building authentic relationships and trust to conduct complex occupational injury studies in under-reached communities takes time, effort and resources. One trainee from the Midwest Center for Occupational Health and Safety at the University of Minnesota, (RETRACTED FOR REVIEW), has taken on these challenges through her study of discrimination and racism among front-of-the-house and back-of-the-house workers within the food service industry. Part of her training has involved the study of critical race theory and systems of oppression and disparities within the food industry to inform her research questions and methods. Her research examines work structure and its impacts on physical and psychological injury for food industry workers in the Minneapolis-St. Paul Metropolitan Area.

In collaboration with two community partners from a local health department and a non-profit worker advocacy organisation, (RETRACTED FOR REVIEW) established a robust Community Advisory Board (CAB)—which consisted of members from the food service industry, advocacy organisation, health department and civil rights department—that informed the development of research questions, data collection methods and instruments. Using a mixed method design, based on the principles of Creswell participatory social justice exploratory design,[21 22] the study began with qualitative interviews of food industry workers recruited with the assistance of her community partners. Her analysis of interviews identified key themes that reflected lived experiences of racism and discrimination, often manifested by abrupt changes in work schedules, reduced work hours and wage theft. The instability of work hours reportedly led to feelings of disempowerment, financial strain, disruption to family life and stress. Her qualitative findings led to the codevelopment of a quantitative instrument and recruitment strategies with the CAB to measure the association between discrimination, occupational injury and stress. (RETRACTED FOR REVIEW) plans to use the study's findings to inform policy changes and interventions for marginalised food industry workers in collaboration with her community partners.

CONCLUSION

As illustrated in the four case studies, community-based research and culturally responsive methodologies can complicate our understanding of workplace safety and health, revealing the interplay between work-related hazards and broader social factors. By prioritising the voices and lived experiences of workers, we not only enhance our understanding of the challenges they face but also pave the way for actionable solutions that address the root causes of health inequities. As our field moves forward, it is imperative that scholars continue to collaborate with workers, practitioners and policymakers to foster environments where all workers can thrive and achieve optimal health.

Contributors All authors are responsible for the content, and all have participated in the concept, design, drafting and revising of the manuscript. The first author is the guarantor for the manuscript.

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Competing interests None declared.

Patient and public involvement statement Each case study was conducted with public involvement, including collaborating with local organisations, conducting, community-based research, conducting participatory research methods or forming Community Advisory Boards.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by University of California, Irvine (18-1596); University of North Carolina—Chapel Hill (17-1853 & 18-1596); UTHealth (23-0704); University of Minnesota (00018551; 00021748). Participants gave informed consent to participate in the study before taking part.

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