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**Ensuring organization-intervention fit for a participatory organizational intervention to improve food service workers' health and wellbeing: Workplace Organizational Health Study**

**Abstract**

**Objective:** Food-service workers' health and wellbeing is impacted by their jobs and work environments. Formative research methods were used to explore working conditions impacting workers' health to inform intervention planning and implementation and to enhance the intervention's 'fit' to the organization.

**Methods:** Four qualitative methods (worker focus groups; manager interviews; worksite observations; multi-stakeholder workshop) explored in-depth and then prioritized working conditions impacting workers' health as targets for an intervention.

**Results:** Prioritized working conditions included: ergonomics; work intensity; career development and job enrichment. Data revealed necessary intervention mechanisms to enhance intervention implementation: worker and management communication infrastructure; employee participation in intervention planning and implementation; tailored worksite strategies; and ensuring leadership commitment.

**Conclusions:** These targeted, comprehensive methods move away from a typical focus on generic working conditions, e.g. job demands and physical work environment, to explore those conditions unique to an organization. Thereby, enhancing 'intervention-fit' at multiple levels within the company context.

**Keywords:** occupational safety; occupational health; injury prevention; organizational culture; musculoskeletal disorders; total worker health; health promotion

## **Introduction**

Food service work is among the occupations with the highest rates of injury and illness.<sup>1,2</sup> The food service industry is one of the largest in the United States (U.S.), employing 92.5 workers per 1,000, with jobs projected to increase by 15% over the next decade.<sup>3</sup> Organizations are becoming increasingly more concerned about the health and wellbeing of their workers. Modifying working conditions through implementation of organizational policies, programs and practices focused on safety, health and wellbeing creates work environments in which workers are more likely to be engaged and satisfied with their jobs, are psychologically and physically healthier, less likely to experience work related injury, and are more likely to comply with legislative requirements.<sup>4-6</sup> In the present study, we build on existing evidence on how to develop sustainable effective organizational interventions to improve employee health and wellbeing by focusing specifically on the formative research phase of intervention planning and development. We aimed to identify problematic working conditions specific to the company context that could be modified through specific intervention process and content mechanisms,<sup>7</sup> with the overall goal of improving worker health and wellbeing and enterprise outcomes of interest. This paper addresses a gap in the literature by describing the formative research methods that guided intervention development and planning. Organizational interventions can be complex; no two companies are alike, even within the same industry. Specifically, we describe how working in the food service industry impacts health and wellbeing; methods to identify workplace conditions; how working conditions manifest differently intra-industry; and a conceptual model to inform an intervention Proof of Concept (PoC) trial. Our formative research methods allowed us to tailor our intervention approach to a company in the U.S. food service industry, thereby ensuring optimal organization-intervention fit to enhance intervention success.

The formative research described in this paper informs the intervention content and processes for a PoC intervention trial, the Workplace Organizational Health Study (WOHS). Whilst it is part of a larger project, this formative research is significant as it described replicable participatory methods that can be used to develop intervention content and process mechanisms. This study is being conducted in

collaboration with a food service company to test the efficacy of an intervention that uses a comprehensive systems approach to improve worker health, safety and wellbeing by focusing on changes in workplace policies and practices. Using principles of participatory engagement, the intervention will focus on working conditions that impact front line FSW health, safety and wellbeing within the context of both their site and organizationally. Overall, the WOHS had three main objectives: (1) identify working conditions expected to be associated with health, safety and wellbeing, and which could feasibly be modified through changes in management policies and practices; (2) determine the feasibility and potential efficacy of an organizational intervention designed to improve working conditions and workers' health safety and wellbeing; and (3) understand variation in intervention implementation that in turn influences the outcomes. This paper, describing the formative research, focuses on Objective 1 of the WOHS.

### **Working in the food service industry - how does it impact workers' health and wellbeing?**

Food service workers (FSW) perform a variety of job tasks including customer service, food preparation, cooking, serving, food retail and cleaning/dishwashing. These tasks have high physical (e.g. repetitive cutting, lifting and carrying heavy objects) and psychosocial (e.g. fast-paced, high-pressure tasks dependent on customer and client demands) demands.<sup>9</sup> Additionally, workers are exposed to hazards in their physical work environment, e.g., handling hot or sharp objects. Consequently, workers are at high risk for work-related injuries caused by slips, falls, burns, frostbite injuries from prolonged exposure to freezers, lifting and carrying, cuts, traumatic injury from knives, slicers, mincers or broken glass, as well as repetitive strain injuries.<sup>9,10</sup> A recent study found that FSW have a 60% higher probability of experiencing occupational injury or illness than workers from all other industries.<sup>11</sup> Additionally, they experience high job stress and among the highest rates of workplace bullying and harassment.<sup>12</sup>

Despite the known deleterious effects of working conditions on FSW health and wellbeing, few studies have focused on how to design effective and sustainable organizational interventions in this industry. Three existing studies of FSW found little effects of the intervention on their primary

outcomes.<sup>13-15</sup> In addition, Haukka et al. concluded that the scope of their intervention was too narrow because other elements of the work environment, such as work organization and processes, were not considered in the intervention's targets.<sup>14</sup> In these studies, organizational members had little input on which working conditions would be the intervention's focus.

### **How do working conditions manifest in different organizational contexts within the same industry?**

In occupational health and related fields, it is commonly assumed that workers within the same occupations have similar work environments and are exposed to the same working conditions. However, there is an increasing awareness that these exposures can differ widely across workplaces, even within the same industry.<sup>16</sup> Putting this to the test, Persson et al. found that although workers in two different manufacturing companies performed similar tasks, there were wide variations in how they rated their job demands, the amount of control they had over their jobs and levels of workplace social support.<sup>17</sup> Unge et al. also found that hospital cleaners reported differences in physical workload, decision latitude and work demands depending on the type of organization in which they worked.<sup>18</sup> Together these findings suggest that when designing organizational interventions, much effort needs to be invested in identifying the specific working conditions unique to an organization's context and understanding how general working conditions (such as physical job demands, work organization, and psychosocial work environment) manifest in different ways across different companies and worksites within the same company. Such identification is likely to ensure that interventions are targeted to workers' health, safety and wellbeing needs and priorities.

### **What methods can we use to identify how organizational differences impact working conditions?**

Acknowledging the failure of standardized questionnaires to identify intervention targets,<sup>19</sup> previous intervention studies have focused on sequential mixed method designs by using qualitative components to inform quantitative surveys to screen for workplace hazards. Vignoli et al. developed a few tailored items and analyzed these in connection with standardized items on a questionnaire.<sup>20</sup> Nielsen et al. developed

tailored items to assess working conditions specific to the local context in postal service workers.<sup>21</sup>

Following the intervention, employees and managers reported that although this approach helped develop specific and relevant action plans, the researchers found that the questionnaires were time consuming to create and required high levels of expertise to develop. Although these studies suggest a way forward to better capture organizational context, they have two main limitations. First, even tailored questionnaires reduce rich data to a few items that may not lead to an in-depth understanding of actual problems in the workplace. This reductionism can potentially miss key issues if they are not included in the questionnaire. In the present study, we took a unique approach to organizational interventions by prioritizing the perspectives and lived experience of FSW and company management collaboratively using participatory human-centered approaches.<sup>22</sup> Within the work environment, we used focus groups of workers, interviews with managers and observations of worksites to identify how working conditions translated into health and wellbeing issues in this particular organizational context. These methods have successfully been used previously by two of our coauthors in their intervention study focusing on tobacco cessation in teachers in India.<sup>23</sup> They found that this multi-method approach went beyond the limited scope of surveys by using various qualitative data collection methods to explore and triangulate perspectives across various stakeholders. These findings are presented in Section 1 of the Results.

Employee participation, that is, obtaining input and feedback from front line workers and other workers at different hierarchical levels in the company, has been found to be particularly successful in developing intervention content, process and implementation. This is achieved by addressing employees' concerns simultaneously with the company's needs.<sup>24</sup> It has also been found to empower and engage workers, thereby enhancing the validity and creditability of the changes being made through the intervention.<sup>25</sup> As such, participation is important to ensure that the working conditions that organizational members perceive to be the most important are prioritized and used as input for developing successful action plans to modify working conditions. In Section 2 of the Results, we describe how organizational members synthesized and prioritized the qualitative findings in a 'sense-making' workshop. This goes beyond the approach used by Nagler et al.<sup>23</sup> The workshops served the dual purpose

of attaining ownership and leadership buy-in through the co-creation of intervention content.<sup>26</sup> By engaging members in shaping what the intervention will be focused on achieving, the intervention in and of itself is more likely to be effective and sustainable.<sup>24</sup>

## **Methods**

This formative research was conducted as part of the *Intervention Development and Planning* phase of the Workplace Organizational Health Study, an integrated participatory organizational intervention focused on improving food service workers' health and wellbeing. The study design for the entire intervention PoC trial is described in full in Sorensen et al.<sup>36</sup> Formative research is an integral part of the research process to ensure organization-intervention fit, manager and worker buy-in, and overall intervention success, which are also key principles of organizational interventions.<sup>24,28</sup> It uses qualitative and/or quantitative methods to inform the development of intervention approaches by systematically assessing the setting, characteristics and priorities of potential participants, and possible facilitators and barriers to the intervention.<sup>37,38</sup> In this study, we used four methods of data collection: focus groups with workers, interviews with managers at different hierarchical levels, and observations of cafeteria worksites, which were then followed by a workshop to provide in-depth perspectives on how these working conditions and health concerns manifest in the different cafeterias and to prioritize those working conditions that have the greatest amount of impact on the workers to be the focus of the intervention. We also considered existing organizational structures and company resources that would provide a feasible starting point.

This study received ethical approval for human subjects research through the Harvard T.H. Chan School of Public Health Office of Regulatory Affairs and Research Compliance.

### **Conceptual model for building intervention content and process**

A conceptual model that provides a comprehensive framework for mapping working conditions in the intervention planning and development phases is the Harvard Center for Work, Health and Wellbeing's model for Integrating Worksite Health Promotion and Health Protection (HWHW conceptual model).<sup>27,28</sup> This model is grounded in several theoretical perspectives including the social ecological model,<sup>29</sup> social contextual model of health behavior change,<sup>30</sup> hierarchy of controls,<sup>31</sup> organizational economics,<sup>29</sup> community-based participatory research frameworks,<sup>32</sup> job strain,<sup>33</sup> and sociotechnical systems theory<sup>34</sup> as described in Sorensen et al.<sup>35</sup> The HWHW conceptual model depicts the complexity of the organization–worker relationship embedded within larger organizational, industry, and societal contexts (Figure 1). It is based on the premise that addressing multiple pathways focused on improving working conditions specific to a particular worksite will contribute to the greatest improvements in workers' health and wellbeing as well as enterprise outcomes. The HWHW conceptual model was used as the foundation to guide intervention planning by enabling the research team to map qualitative data collected in the formative research to the model's domains and was the main deliverable from the formative research activities. This is detailed in Section 3 of the Results.

*<INSERT FIGURE 1 ABOUT HERE>.*

## **Aims**

The formative research addressed the following specific aims:

- (1) Using a comprehensive qualitative approach, identify how working conditions manifest in worksites as antecedents to workers' health and wellbeing within a large multinational food service organization.
- (2) Using a participatory sense-making activity, generate a shared understanding between stakeholders of the intervention's target working conditions and processes based on priority working conditions and determine what could be feasibly implemented.
- (3) Grounded in the HWHW's conceptual model, use the data from Aims 1 and 2 to develop a conceptual schema to be used in intervention development and planning.



## **Context and participants**

This study was conducted in collaboration with a large multi-national organization (company), which is one of the largest employers of FSW, both in the U.S. and globally. This organization was motivated to improve worker health and wellbeing and collaborated with the research team to develop intervention content and processes that could be integrated into their existing business structures while also considering the distributed nature of the workforce across multiple worksites. Although the company has a strong safety focus, they were motivated to focus more broadly on worker health and wellbeing.

The formative research was conducted during Spring-Summer 2017 with FSW, site managers, district managers and senior managers of a food service company in the Greater Boston area, U.S (i.e., within 50km radius from Boston). This location was selected due to its geographical proximity to the research team. Originally, 60 client accounts with 1-2 cafeterias per account were identified in the Greater Boston area. Eligibility criteria was applied to the cafeterias. Cafeterias were included they had 7-30 employees, provided food service to “Business and industry” accounts (e.g., legal firms, banking, medical companies, universities), and had stable (i.e. no risk of loss of contract during the study) contracts with the client vendor. The rationale for including only sites with 7-30 workers is that some sites would not be eligible for the intervention PoC trial (due to their small size) and very few sites had above 30 workers (thus it would be difficult to match based on size for the intervention and control groups). Twelve client accounts with 15 cafeterias met these criteria. Five accounts with a total of 53 workers became the formative research sites, and the remaining 10 sites were later randomized for the PoC trial. In accounts that had a site participate in the formative research, a separate site location within the same account was selected to be recruited for the PoC trial.

Food service is provided to clients based on a contractual agreement between the food service vendor company and the client (e.g. university). As such, the physical work environment, equipment and maintenance are generally provided by the client. Contracts can also vary between worksites depending on a client’s needs and infrastructure. The food service company employs the workers and is responsible

for the purchasing of raw food products, food preparation and service, additional catering activities and retail. FSW in this setting typically face high work demands shaped by both their own and the client company's values, priorities and the nature of food service itself<sup>6</sup>. Their work is fast-paced, often unpredictable and characterized by exposure to hazards in the physical and psychosocial work environment. Hierarchically, each site has a manager responsible for the day-to-day functioning of the sites, and a district manager who is responsible for a number of sites in a geographical region. At the more senior levels, there are personnel responsible for other key functions within the company such as health and safety, human relations and operations.

### **Data Collection**

Our employer-centered approach was combined with a comprehensive qualitative methodological design that utilized several qualitative data collection methods to identify intervention targets (working conditions) and feasible intervention process mechanisms<sup>39</sup>.

The purpose of the comprehensive approach was to identify working conditions that manifest as antecedents for workers' health and wellbeing and to understand the context, lived experience and perception of those at the front-line. The interview/focus group guide and observation topic areas were based on key domains from the Harvard Center's conceptual model<sup>27</sup> (Table 1).

*<INSERT TABLE 1 ABOUT HERE>*

### **Focus groups with FSW**

Focus groups are a dynamic method that allows exploration of a topic from multiple perspectives while facilitating the production of data through social interactions of the focus group members.<sup>40</sup> Through communication and interaction between participants, researchers are able to explore the experience,

knowledge and perspectives of a group or people.<sup>41</sup> Focus groups were conducted with front-line FSW at five cafeterias in the Greater Boston area, U.S. Only front-line FSWs were invited to participate from eligible cafeterias. Site managers and chef managers were not eligible to participate and were not present during the focus group. Food service workers in a focus group were all from the same cafeteria. The research team provided flyers to be distributed and a script (in both English and Spanish) to be read by the site manager in a team meeting inviting front line FSWs to participate by attending a one-time focus group. The date and time of the focus group were provided. Workers were simply told that it was voluntary to attend the focus group. Consent to participate was indicated by attendance at the focus group. In order to accommodate the small number of workers at one site and the inability for all staff to be released from food service duties at one time, individual interviews were conducted at that site. All focus groups were conducted on-site, however, priority was placed on conducting the groups in a way that made the workers feel comfortable speaking openly about their working conditions and concerns regarding their health and wellbeing. To maintain privacy and confidentiality, no managers attended or observed the focus groups, and groups were held in a private room or a remote corner of the cafeteria. All focus groups took between one hour (56-60 minutes).

Focus groups followed a semi-structured interview guide and were moderated by a qualitative research expert (AR). The guide focused on the overall work experience of FSW and included questions related to working conditions that impact worker health and wellbeing, important aspects of workers health and safety (such as pain, injury and fatigue) that could be the focus of interventions, and ideas and perspectives on how working conditions could be improved (Table 1). The focus group guide was supplemented by vignettes using photographs and a body map.<sup>42</sup> Their purpose was to elicit responses regarding workers' perspectives and experiences related to specific working conditions using the associated imagery technique.<sup>42</sup> The photo vignettes depicted certain activities, such as food preparation, food service in a rush period, and an interaction between a supervisor and front-line FSW. These were used to probe participants about what they would do in a particular situation or how they would respond to certain workplace dynamics. These vignettes enabled participants to discuss their own experiences by

facilitating a reaction or opinion. A body map was used to explore workers' pain and injury experiences by documenting work-attributed pain areas on a diagram of the human body. It is an effective research approach bridging language, literacy and cultural backgrounds.<sup>43</sup> All workers who wanted to participate and were available at the time of the focus group participated in the focus group. Whether the focus group was conducted on work time was at the discretion of the site manager and out of the control of the research team. At some sites the focus groups occurred in the course of the scheduled shift time but during a quiet period, while some of the focus groups were scheduled after their shift. All workers received a USD\$20 gift card for their participation.

#### Observations of food service sites

Ethnographic methods have the benefit of placing the findings from focus groups and interviews into context through the observation of everyday practices in everyday settings.<sup>39,44</sup> They allow the researcher to see beyond what they are being told and provide new insights into complex social phenomena, serving to triangulate data from the focus groups and interviews. They allow for progressive refocusing in the intervention development process.<sup>45</sup> Non-participant observations of food service worksites were conducted on a normal workday at the same five worksites in which the focus groups were conducted. Observations were carried out over a three to four-hour period before the focus group at each worksite. Observations focused on the customer-facing, kitchen preparation and storage areas at each worksite and were timed to capture work experiences during peak and off-peak hours. The observations served a dual purpose in the research process. First, they familiarized the researcher with both the setting and social dynamics of each worksite and facilitated the rapport building with the FSW, thereby improving her contextual understanding of the dynamics discussed in the focus groups and facilitated in-depth discussions during the groups. Second, extensive field notes were taken during each observation and these notes were summarized for the research team and discussed during a research team meeting. Field notes were structured to record the following data: (1) *Space*: description of the location of each area e.g. physical work environment, equipment, customer and employee spaces, unused work areas, private areas

for meal breaks, amount of space to perform work activities; (2) *Actors and Activities*: description of the food service workers, managers and customers and the actions/tasks they perform, e.g., how many people were working in specific work areas, which jobs workers were performing, examples of job sharing, job demands of the activities, clothing and uniforms, break patterns; (3) *Social interactions*: description of the people's interactions and expressions: e.g., type of interactions, quality of interactions, support between workers/managers, customer interactions, intensity throughout the day and at peak times. These provided broader context to the interviews and focus groups..

#### Interviews with managers at different levels of the organization

Qualitative interviews allow for in-depth insight into perspectives, motivations and experiences of key stakeholders. In this study, interviews allowed for a distinct point in our data triangulation and provided unique first-hand perspectives into organizational dynamics and the lived experiences of those working at different hierarchical levels. Eligibility was based on same criteria for the cafeterias as per the focus groups. Thus, 15 cafeterias with site managers met these criteria. The company generated a list of managers and emailed a recruitment letter on behalf of the research team. One individual nominated another manager to be interviewed in their stead and one individual requested a second manager join their interview (thus, two of the eligible managers were interviewed at the same time). Nine site managers agreed to participate. In addition, relevant senior managers of the company in the U.S. were also invited to participate (Human Resources, Health and Safety, Vice President and Senior Vice Presidents) as well as District Managers for the Greater Boston area. Twelve senior and district managers participated. Telephone interviews were conducted semi-structured interview guide focused on exploring management and leadership perspectives on working conditions, health outcomes, policies and organizational interventions. The interviews were conducted by three members of the research team and took no longer than an hour (25 to 42 minutes). Managers received a USD\$20 gift card for their participation.

Sense making and prioritization workshop

Following the analysis of the qualitative data, a three-hour workshop was conducted as a sense-making activity.<sup>46</sup> We used sense-making as a framework to give meaning to the qualitative data collected by exploring participants own contextualized collective experiences.<sup>47</sup> Sensemaking highlights that employees are not passive recipients of an intervention; rather, they are actively involved in interpreting, operationalizing, and influencing the content of work environment interventions. It also allowed the findings from the focus groups, interviews and observations to be explored in relation to other cafeteria sites in the Greater Boston area that participated in the intervention PoC trial to discuss how the key issues manifested at those sites, to determine both commonalities and differences across sites. Also, the sense-making activity was designed to capture how the priority working conditions that were identified from the five formative research sites manifest across other food service sites in the Greater Boston area, including the intervention PoC sites. This allowed us to select working conditions that were applicable and problematic across the intervention sites as well as other sites within the company. This acknowledges that even though a working condition might be problematic across many sites, how these working conditions play out may differ. For example, safety and ergonomics problems might differ across sites and work intensity might be impacted by high levels of caterings at some sites, but lunch peak hours might contribute more to work intensity at other sites.

The purpose of this workshop was to facilitate and empower organizational members to be involved in the co-creation of the intervention content through a process of sense-making of the qualitative data, creating ownership over the content and ensuring leadership buy-in of the intervention's objectives to modify specific prioritized working conditions. Key stakeholders from different organizational levels within the company were invited to participate in a brainstorm followed by an iterative prioritization process to synthesize and make sense of the qualitative data findings relating to working conditions and the different ways they impact on workers' health and wellbeing. In total, there were 26 participants including eight researchers. These included 17 company representatives (nine from health and safety, two from human relationships, two district managers, two from corporate research, one director from quality

assurance, one wellness director) and one external company health and safety consultant. The objectives of this workshop were to: (i) strengthen our collaboration and obtain leadership buy-in and ownership of the intervention content; (ii) review the findings from the qualitative data collection; (iii) explore workshop members' interpretation of the data to create a shared mental model; (iv) determine ways to tailor this approach to fit the organization and different worksites; and (v) align with company priorities and existing resources as a means to build long-term sustainability of the intervention. The workshop consisted of two main sections:

(1) Qualitative data overview: outlining the findings from the focus groups, interviews and observations. The research team developed a summary report of the qualitative findings (with no identifying data) which workshop participants were asked to review three days prior to the workshop. The results of the report were presented in the first part of the workshop as an overview, and participants were able to clarify anything that was unclear.

(2) Participatory sense-making activity: designed to explore the qualitative data followed by a group discussion to discuss the findings from the participatory activity. A rose-bud-thorn activity was used to facilitate the sense-making process.<sup>48</sup> The activity was used to classify and group participants' thoughts on working conditions and their influence on workers' health and wellbeing using a collective interactive activity facilitated by an expert (JM) in building inter-organizational collaborations using human-centered design. In this activity, participants used colored post-it notes (red; yellow; green) to write down their opinions/ideas on positive elements in the work organization and work environment within the company (rose, red post-it); negative elements (thorn; yellow post-it), and areas of opportunity for change (bud; green post-it). The facilitator prompted participants to brainstorm responses on the post-its by posing questions related to the themes generated from the focus groups and interviews. Post-it-notes were placed on large flipchart sheets under each of the main themes. After the post-it activity, the facilitator summarized the main themes emerging from the rose-bud-thorn activity back to the group and sorted the post-it-notes according to similarity into topical clusters using a modified affinity mapping approach.<sup>48,49</sup>

This process allows patterns and priorities to naturally emerge from the data, thus separating the most relevant and important working conditions. This was followed by a facilitated group discussion to confirm the three priority areas to be focused on in the intervention using a group consensus process, and to discuss opportunities for improvement, existing, as well as new/feasible solutions.

### **Data analysis**

All focus groups and interviews were audiotaped and transcribed. Transcriptions were coded using NVivo (QSR International Version 11). Data were analyzed by an experienced qualitative researcher (AR), and analysis was conducted according to a conventional qualitative thematic analysis method<sup>40</sup>. The analytic approach involved a multi-stage coding process that includes both prefigured and emergent codes.<sup>39</sup> Open coding was utilized and combined with prefigured domains from the interview and focus group guides to develop a refined coding structure that was then applied to all transcripts. Considering the applied nature of the study, analysis was oriented towards framework analysis,<sup>50</sup> allowing the description, classification and interpretation of data that would best align with the intervention aims of the broader study.<sup>36</sup> Through comprehensive indexing and charting, data were analyzed and compared both within each group as well as across different groups to characterize both similarities and differences across various key company stakeholders. A second qualitative researcher (SP) from a different discipline and training cross-checked the thematic-coding and analysis against the original transcripts to enhance trustworthiness and interpretations. The observation field notes were used to triangulate and confirm the data observed in the focus groups and interviews. During the analytic process, we first developed a comprehensive report based on the qualitative findings from the interviews, focus groups and observation. Data collected during the sense-making workshop was thematically arranged according to working conditions. Photographs were taken of the post-it notes grouped in their respective working conditions. These were synthesized during the session into common themes. We mapped findings from the qualitative data collection to the HWHW conceptual model.<sup>27</sup>



## **Results**

Our results are divided into three sections based on our Aims. In the first section, we will describe the key findings (working conditions impacting worker health and wellbeing and enterprise outcomes) from the focus groups, interviews and observations. In the second section, we will describe the key findings from the sense-making workshop. In the third section, we will provide a brief description of how these data were mapped to the Harvard Center's conceptual model to inform the intervention PoC trial.<sup>36</sup>

### **Section 1. Findings from the focus groups, interviews and observations**

Qualitative data were analyzed and triangulated across data sources. These included five focus groups with a total of 30 of the 53 eligible FSW (56% participation rate; range 3-15 participants per focus group). Workers who did not participate were either not scheduled to work at the time of the focus group or opted to continue working in the cafeteria as it was not able to be closed during that time. Nine General Managers and twelve representatives from the company's management (including District Managers and representatives from Human Resources, Health and Safety and Operations) were interviewed. Observations of five cafeteria worksites were conducted. Qualitative data identified working conditions and worker (i.e. worker health, safety and wellbeing), as well as enterprise (company-related) outcomes.

Data revealed working conditions that were perceived to impact considerably workers' health and wellbeing and key enterprise outcomes (including absenteeism and turnover, employee engagement, and productivity). In general, working conditions varied across the sites primarily related by these factors: (1) Client related factors including client industry, size and location, relationship at the site with the client and differences between contractual agreements; (2) Organizational culture of the site (including health and safety); and (3) Factors related to the site's middle management such as leadership and communication style of the site and district managers, level of worker participation in decision-making and site specific initiatives. The qualitative data highlighted how a worksite's unique characteristics influences how the intervention could be tailored across worksites. It is important to note that although

these working conditions themes were identified across sites (i.e., the working conditions identified were discussed at all of the sites), the way the working conditions presented at the sites differed due to the unique characteristics of the sites. Thus, the data emphasized the need to tailor the intervention not only at the company level, but also at the site level to ensure adequate organization-intervention fit. This was a key finding that influenced our intervention design, i.e., we found that the intervention needed to target two levels - company policy, programs and practices, as well as strategies focused at the worksite level. The following summarizes the working conditions that impacted worker health, safety and wellbeing, as well as enterprise considerations.

### **Physical work environment**

Safety and Ergonomics: Participants from all groups (i.e. FSW and managers) reported that physical hazards existed in the work environment but were often influenced by the different FSW job tasks. For example, workers reported back and lower extremity pains that they attributed to the hardness of the floors for those that stood for most of their shift and cashiers reported shoulder pain due to the set-up of registers at some sites, whereas workers in the kitchen areas were exposed to equipment, knives and thermal hazards (e.g. steam). These working conditions were discussed often in relations to safety practices at the site and injuries ranging from minor cuts and burns to catastrophic injuries. Bodily strains were reported due to heavy lifting and carrying and repetitive tasks, e.g., chopping. Bright lights contributed to headaches. Safety practices were generally perceived as high across sites due to the company's heavy focus on health and safety. However, how these practices were implemented at the sites differed, for example, due to site-level culture and manager practices, as well as possible contractual obligations of the client to provide and maintain safe and operational equipment and built environment of the cafeteria. One FSW described how the work environment impacted fatigue levels:

*"...being out in the deli during lunch can be tiring..... It gets very hot because we have [sandwich] presses and grills going and steaming, and the whole building is on the same air-*

*conditioning unit so they can't make it cooler for us. So, we're sitting there and sweating and dehydrating and that can become very tiring."*

### **Work organization**

Workload, work flow and work intensity: Various factors were discussed in relation to the workload of the FSW and site managers largely related to work flow during any given day (e.g. meal time rush), and also peak work times of the week and/or time of the month or year (e.g. seasonal variations). Participants reported increased workload due to increased food preparation and service at peak times as well as catering jobs, which often come through with little notice and have tight deadlines. FSW at some sites reported that during these peak times, safety practices sometimes came second to productivity and delivering meals and catering orders on time. Catering demands also varied between sites depending on the client's needs and the site's infrastructure, which increased work load and the intensity of work to complete catering jobs within a required timeframe. These were discussed to have impacts on both worker health and wellbeing and enterprise outcomes.

Staffing absences and turnover: Demands on staff were exacerbated when staff were absent. If absent workers were not replaced, then co-workers needed to assume the missing worker's tasks. While temporary workers were sometimes brought in to cover short-falls in staffing, a number of additional challenges often arose, such as the time required to adequately train temporary staff and their limited knowledge of the site or job tasks. Some of the sites had less stable workforces than others, and this consequently influenced how problematic this was for the specific site. Regardless, staffing issues frequently resulted in permanent staff being required to perform duties outside of the roles of their normal job either because of shortfalls or due to the limited skills and knowledge of temporary workers.

*"I think it's just availability because people are out some days. Not everybody's here. So, when someone's out, someone else has to sort of step up and fill in for them. And even if it's not their*

*job that day, they will do it. I don't work in the catering department but if they need somebody in catering, I will go over and work there and help out.” (FSW)*

Due to the fast-paced work environment, workers reported experiencing pressure from managers to get jobs done quickly without mistakes. One FSW described how this extra external pressure also contributed to stress in the workplace:

*“Believe me if you screw up or something needs to be done that didn't get done, these managers have no problem telling you, you screwed up or you were supposed to get this done and didn't get it done. That it is unacceptable - do it right the next time.”*

For district managers, staffing was also discussed in terms of cost constraints within the competitive business environment limiting headcount, and the amount of money able to be paid for workers' hourly salary. Managers reported challenges associated with finding and retaining skilled staff in the current high-turnover employment market, where workers could be paid more in other hospitality settings, such as in hotel. This was impacted largely across sites based on their geographical location, with more metropolitan worksites having to compete with large hotel chains and other food service companies.

Shifts and schedules: Sites who offer regular day-time shift schedules (i.e. no night shifts), due to the corporation setting dining schedules, enhanced worker's work experience and job satisfaction. Workers often favorably compared their current work situation with other food service workplaces that require weekend or unpredictable schedules. Workers identified this as a key benefit, enhancing work-life balance by being able to schedule activities outside of work, such as family commitments. For example,

*“I enjoy my job. I don't have a very good pay. I know. Thirteen years, I don't have a very good pay... The reason I like [my job], is because I have time to go pick up my grandson. I help my daughter... So, I like my schedule.” (FSW)*

However, this was reported to have one limitation in that it limited flexibility to perform personal activities during business-hours, such as medical appointments.

Communication was a key theme discussed throughout all topic areas in the focus groups and interviews as well as being observed at the food service sites. The multi-layered and hierarchical aspects in a large organization were identified as one of the key barriers to communication. Thus, communication was most often described as a “slow cascade from the top down.” The responsibility to communicate information to FSW falls on the site managers, generally through team meetings. However, participants reported that there was often a disconnect between the content of the information and the method of communication from the senior leadership to the front-line workers. For those sites with large immigrant workforces from different backgrounds, challenges also exist with information often being provided only in English or Spanish instead of other languages spoken (e.g., Portuguese, Haitian, French, Bosnian, Serb-Croatian). An additional barrier to communication was the lack of resources (e.g., time) and capacity that a site manager has to communicate relevant information to the FSW through regular team meetings or other in-person methods. These processes varied markedly across sites. For example, some sites conducted regular daily ‘huddles’ with all team members, while other sites might conduct a number of small group meetings. A smaller site might find it easier to communicate key information on-one-one as it may be difficult to pull all workers off the floor at the same time. In general, all participant groups reported that communication processes could and should improve, and without improvements in the current communication processes the intervention would potentially be unsuccessful. A FSW reported that communication issues, such as infrequent or unclear communication, were common:

*“That's where I'm saying the communication often breaks down. It's like there will be an expectation that wasn't communicated, and then you find out the next day and then you get yelled at...”*

### **Psychosocial work environment**

Job enrichment and career progression was described by both district and site managers. They detailed the importance and challenges of creating work environments that were engaging and enriching for FSW. Opportunities for advancement or alternate career paths within and outside of the company were generally not clearly defined for FSW, and providing opportunities for growth and learning was challenging. One site manager described the challenges of providing job enrichment and career advancement opportunities:

*“I really think it’s the way that you treat them, work with them and respect them. And provide them some ability to grow, which is really few and far between that anyone really grows out of some of the positions that we have here. So that would be something, if there was more of a way to give people in different positions a way to improve their career, and then they would possibly get more money in that sense...”*

This was confirmed by the FSW, who reported lack of awareness over what career pathways or job enrichment activities were available to them through the company or elsewhere. Additionally, FSW reported further confusion over the necessity of performance reviews when good performance was not associated with a pay increase or other added benefits. Managers discussed how this was associated with less engaged and less satisfied FSW.

Site managers reported different avenues they had attempted to enhance career advancement, such as, cross-training workers, or discussing opportunities for advancement. However, this differed markedly at the site-level and appeared to be dependent on the site manager.

Coworker and supervisor support were seen as critical aspects of the work environment that contributed towards workplace culture, work-related wellbeing, job satisfaction and productivity. Teamwork and civility were viewed as key attributes of this and were seen as being invaluable in a potentially stressful work environment.

*“I try to listen to everyone and take everyone's perspective seriously. During times when it's really busy, it can get hectic and we can speak to each other in like an intense way. But overall, I think we all understand the situation and what we have to do. And I mean, not always – it doesn't always*

*happen that someone will say “sorry, I spoke to you like that”. We just have to get it done. But I mean, I think there could be more of that so people understand it's like nothing personal. We're just all trying to work together.” (FSW)*

Also, site managers often referred to support and teamwork in terms of them assisting on the floor:

*“I think a [site] manager that gets down in the trenches, and helps out their employees will alleviate stress. It shows that help is there if needed. Someone is looking out for them to make sure that they're not gonna fail which will reduce stress. So, I believe that supervision also directly affects the stress and anxiety of front-line employees.”*

With respect to supervisor support, clear expectations and frequently communicating about work tasks and priorities were seen as important aspects of creating a supportive and productive work environment. FSW also described a supportive supervisor as one who provides recognition and appreciation for a job well-done, and above all *“treats you like a person”*.

Decision making was generally described as top-down, with senior leaders making decisions that then channel down to other layers of the company. Decision making about workflow, FSW tasks and day-to-day operations was generally controlled by site general managers at the worksites, and thus differed between the sites. FSW reported having little to no job control and very limited decision-making capabilities.

Customer interactions were seen as a key part of the psychosocial work environment. Customer requests that were difficult to accommodate or complaints were common and could contribute to a stressful work environment and cause delays in service. A site manager described the impact of dealing with difficult customers: *“It could be a stressful interaction with a customer if a customer is going to be a little irrational or demanding.... And how can I say this? Especially if it's more of a Caucasian-based*

*customer base. And some of them look down on [immigrant] FSW and they're very demanding.....And sometimes it's tough for them if they don't get the training on how to deal with customer complaints.”*

## **Section 2. Sense making and prioritization workshop findings**

To explore and make sense of the key themes identified in the focus groups, interviews and observations, organizational members indicated on cards their own perspectives of positive aspects of working conditions, negative aspects, and potential areas of opportunity (including any solutions that could be feasible for addressing the working conditions), by drawing on their own experiences working in the organization. Table 2 summarizes data that was collected from the rose-bud-thorn activity. Each item on this table was discussed at the sense making workshop, but this does not necessarily mean that it will be included as a component in the final intervention. What Table 2 does show is the breadth of information that can be obtained from a short workshop, that can be used as a starting point for planning the components of an intervention. The activity provided visualization of the data using post-it-notes through which common themes could be grouped together in logical clusters. Through this process, we were able to synthesize and make sense of the emerging data, view relationships between working conditions and outcomes and place importance on key working conditions.

*<INSERT TABLE 2 ABOUT HERE>*

This sense-making activity was followed by a discussion to prioritize the working conditions to be targeted by the intervention and to identify key underlying intervention processes. The workshop also familiarized the research team with contextual factors that might impact the intervention implementation, e.g., to identify existing or needed resources, and potential barriers and facilitators to the intervention.

Communication processes was a key theme identified during the sense-making activity that was viewed as most important and in turn would affect other working conditions. Communication channels between the client and organization, upper management and worksite, between and within worksites, as well as between the site manager and front line workers were identified as critical paths in which



communication mechanisms could be established or enhanced. Worksites could become very isolated from other worksites and thus any learnings or best-practices were not communicated between sites. A disconnect between upper management and the worksites was also reported and this manifested as the worksites feeling like they operate in isolation with little knowledge of resources or tools that might be available to them. Data indicated that this was a common theme across all of the sites, and warrants further consideration for the intervention.

As previously mentioned, intervention fit was also viewed as a key process mechanism that required fitting not only to the organization itself, but also to the specific worksites that have different client needs with different contracts, different parameters in which they work (e.g., built environment and equipment), and different staffing and site manager needs. In terms of fit at the organizational level, participants emphasized the need to build on their existing resources and good practices to ensure the intervention became a part of their everyday business. This would also facilitate the intervention's scalability across the rest of the organization after the intervention study was completed.

At the end of the sense-making activity, group consensus was used to confirm the three most important and influential working conditions that would be the focus of the PoC intervention trial: (1) Work intensity; (2) Safety and ergonomics, and (3) Job enrichment and career development. During the workshop, outcomes were also confirmed by group consensus. These included the following worker outcomes: wellbeing (general and work-related wellbeing and job satisfaction) and pain and injury reporting. Two key enterprise outcomes were also identified: turnover and employee engagement. These outcomes will be used to measure intervention effectiveness. Communication and fit were identified as key mechanisms for intervention processes, along with worker participation and leadership commitment, which was pre-defined by the research team.

### **Section 3. Synthesis – using the formative research findings to develop our conceptual schema**

Data from focus groups, interviews, observations and the intervention planning and prioritization workshop were analyzed and mapped to the HWHW conceptual model framework. Figure 2 outlines the

working conditions and outcomes that were discussed and prioritized using the formative research methods. Through the prioritization workshop, consensus was reached to prioritize and focus on the working conditions and outcomes in bold. Worker and workforce characteristics are based on demographic data of the industry in the U.S.<sup>3</sup>

*<INSERT FIGURE 2 ABOUT HERE>*

### **Discussion**

Through a comprehensive employer-centered qualitative methodological approach, we utilized systematic data collection methods to triangulate data derived from FSW and management from one of the largest employers of service workers in the U.S. This was used to guide priority areas for developing a participatory organizational intervention and facilitating organization-intervention fit. We identified and prioritized working conditions (i.e., intervention targets) considered most important to FSW as well as company management within the company's organizational context. Using these methods, we successfully engaged both front-line FSW and managers collectively to develop a framework for an organizational intervention. These qualitative methods strengthen the fit of the intervention to the organization by engaging workers and managers voice when planning and developing the intervention. By involving employees in both identifying and then prioritizing the intervention targets, our intent was to provide a sense of ownership over the intervention, attaching value to the content of the intervention. A benefit of this approach was that it also allowed us to identify working conditions, such as job enrichment and career advancement, that we may not have considered apriori. This approach will also allow us to focus on addressing multiple pathways, as per our conceptual model, targeting working conditions through a holistic intervention approach, which will hypothetically result in greater changes to workers' health, and wellbeing and enterprise outcomes.<sup>36</sup>

Our formative research approach was based on our previous work that has found that integrated employer-centered approaches focusing on improving both the physical and organizational/psychosocial

work environment will be most effective in improving worker safety, health and wellbeing.<sup>24,27,51</sup> This approach includes (i) using participatory and human-centered methods in identifying intervention targets and outcomes, as well as intervention processes and content, (ii) focusing on changing the conditions of work through policies, programs and practices, rather than individual worker behavior and, (iii) using both top-down and bottom-up approaches in intervention development and implementation. Recent studies have shown promising results using these types of approaches in improving workers' health and wellbeing in low-wage service related industries, including food service, through changes to the work organization,<sup>52</sup> psychosocial work environment,<sup>13,15,53</sup> and physical work environment and job demands.<sup>14,15</sup> However, many studies focus on only one element of the work environment, such as a self-scheduling intervention or an ergonomics program.<sup>52,54</sup> These studies generally found small or limited improvements to workers' health and wellbeing. Thus, intervention processes need to be carefully considered and planned to ensure buy-in from the organizational members. We believe our qualitative methods, as described in this paper, are a necessary step-forward to achieving this.

The comprehensive qualitative methods used in our study differ from most traditional formative research methods others have used to guide participatory organizational interventions. In previous organizational intervention studies, researchers often use surveys of pre-defined measures, or tailored questionnaires.<sup>21,55</sup> This study takes an innovative approach to organizational interventions in the service industry by prioritizing the perspectives and lived experience of FSW and company management and using this to identify activities in workshops. Moreover, through its multi-dimensional approach, this study moves well beyond the limited scope of surveys by using four data collection methods to explore and triangulate perspectives across various stakeholders. Qualitative data were derived from focus groups and interviews, non-participant observations, and a collaborative workshop to explore and prioritize intervention targets and mechanisms. Few other interventions in this low-wage service industry have used the same process paired with a conceptual framework to guide intervention planning. In instances in which these methods have been applied elsewhere, improved intervention effects were observed, e.g.,

Nagler et al.<sup>23</sup> Thus, current thinking is to use such models to conceptualize intervention logic models and theory.<sup>30,56</sup>

Our comprehensive qualitative methods were able to identify priority areas affecting workers' health and wellbeing that could be feasibly modified in the work environment. Using participatory methods, three priority working conditions were identified. safety and ergonomics; work intensity; and career advancement and job enrichment. The qualitative data suggests that work intensity, career advancement and job enrichment impact on worker safety, health and wellbeing in many ways. Although this has not been studied before in food service,<sup>13-15</sup> this is not a new problem in the modern workforce. Today's operational and business environment is highly complex, rapidly changing, dynamic and strongly competitive - emphasizing improved productivity and financial performance.<sup>57,58</sup> Additionally, worksites are distributed across geographic locations, and thus often feel isolated from the overall organizational structure and company resources. The contract between the service-providing company and the food service contractor contributes an extra layer of contextual challenges,<sup>57</sup> adding additional stress both physically and mentally, degrading site working conditions and the overall organizational climate. These contemporary issues plausibly impact on the intensity experienced on the food service work environment, work engagement and job satisfaction.

Due to the considerable differences observed between sites, tailoring intervention strategies to target the most relevant issues, to workers and managers alike, was seen as a key aspect of the intervention's design. This ensures that the intervention "fits" the worksites as well as the organization as a whole, promoting long-term sustainability of the intervention. For example, the qualitative data revealed differences were observed in the physical work environment, staffing and turnover, the frequency, size and unpredictability of catering orders, workplace culture, and leadership style of the middle managers. Site managers emphasized that different sites had different resources and time constraints that would also need to be considered when developing and implementing the intervention. Thus, tailoring the intervention to each worksite as well as having the managers as key agents of change

in the intervention process were perceived to be potential strengths to be incorporated into the final intervention design.

The focus groups and interviews also confirmed that leadership and supervisor support as well as communication between the various organizational levels would be critical to the implementation of the intervention and hence important for intervention success. Due to the existing top-down company structures that were observed, this was seen as vitally important to implementing organizational change through policies, programs and practices, as well as changing the way employees are engaged in decision making and problem solving. During the prioritization workshop, participants discussed the importance of trying to put in place more bottom-up mechanisms to achieve this, but also acknowledged that leadership commitment would be needed in order to successfully facilitate this change.

A strength of this study is the comprehensive and systematic approach to identifying intervention targets based on a well-developed and accepted conceptual model. The goals and the content of the intervention were defined by employees and managers within the organization. The emphasis on participation of workers in the intervention pre-planning was deemed necessary to ensure organization-intervention fit. The qualitative data collected in the formative research validates the methods that we used.

A limitation of this study is that the approach we used may not be generalizable to other industries or organizations. Rather, it elucidates the importance of selecting appropriate formative research methods to obtain data in both an appropriate and adequate fashion within a particular organization. A second limitation was that front line workers were not included in the sense-making workshop. However, we believe that their ‘voice’ was heard as the data used to inform this workshop was derived from front line worker focus groups. Workers will also be included in the intervention development phases to develop content and implementation.

## **Conclusions**

This study used formative research methods to explore work-related factors impacting FSW health and wellbeing in a large corporation to enhance the organizational ‘fit’ of a proposed intervention. Using comprehensive employer-centered qualitative methods, including focus groups with workers, interviews with company management, worksite observations and a multi-stakeholder workshop, we identified, explored in-depth and then prioritized working conditions impacting health and wellbeing to inform an intervention PoC trial. We propose that these human-centered design methods are more comprehensive and targeted than other methods, engaging workers and managers at various levels within an organization throughout the intervention development process, and ensure the intervention’s fit to the organization’s characteristics and existing structures. These methods move us away from focusing on generic working conditions, such as job demands and physical work environment, to explore other factors in an organization’s unique work environment that may be more influential on worker health and wellbeing and key enterprise outcomes and top-down interventions that ignore the voice of those on the receiving end of intervention implementation.

This paper’s significance is grounded in a description of how we used qualitative formative research methods to develop the intervention by: (1) identifying and targeting appropriate and meaningful working conditions that impact workers’ health and safety concerns by exploring working conditions that may not have been identified apriori using other methods, such as generic worker surveys; (2) describing methods with sufficient detail that they could be replicated by other researchers, and engaging the company in a process that they could replicate themselves at a later date; (3) using participatory approaches in the early stages of intervention design which further enhanced leadership’s commitment to the project and worker-buy in; and, (4) providing an opportunity for the research team to gain a better understanding of the contextual factors, the potential barriers and facilitating factors (e.g. existing resources) that could be used to support the intervention.



### References

1. Alamgir H, Swinkels H, Yu S, Yassi A. Occupational injury among cooks and food service workers in the healthcare sector. *Am J Ind Med.* 2007;50(7):528-535.
2. Cann AP. Exploring the risks of occupational injuries in food service workers: A mixed methods approach [Ph.D.]. Ann Arbor, The University of Western Ontario (Canada); 2007.
3. Bureau of Labor Statistics. Occupational Outlook Handbook, Food and Beverage Serving and Related Workers [U.S. Department of Labor website]. 2018. Available at: <https://www.bls.gov/ooh/food-preparation-and-serving/food-and-beverage-serving-and-related-workers.htm>. Accessed 27 December, 2018.
4. Peters SE, Grant MP, Rodgers J, Manjourides J, Okechukwu CA, Dennerlein JT. A Cluster Randomized Controlled Trial of a Total Worker Health® Intervention on Commercial Construction Sites. *Int J Environ Res Pu.* 2018;15:2354.
5. Montano D, Hoven H, Siegrist J. Effects of organisational-level interventions at work on employees' health: a systematic review. *BMC Public Health.* 2014;14:135.
6. Weil D. Enforcing Labour Standards in Fissured Workplaces: The US Experience. *Econ Labour Relat Re.* 2011;22(2):33-54.
7. Nielsen K, Miraglia M. What works for whom in which circumstances? On the need to move beyond the 'what works?' question in organizational intervention research. *Work Stress.* 2017;70(1):40-62.
8. Cann AP, MacEachen E, Vandervoort A. Lay versus expert understandings of workplace risk in the food service industry: a multi-dimensional model with implications for participatory ergonomics. *Work.* 2008;30(3):219-228.
9. Jayaraman S. Behind the kitchen door. Ithaca, NY: Cornell University Press; 2014.
10. Food Chain Workers Alliance. The hands that feed us: Challenges and opportunities for workers along the food chain. [Food Chain Workers Alliance website]. June 06, 2012. Accessed at:



<https://foodchainworkers.org/wp-content/uploads/2012/06/Hands-That-Feed-Us-Report.pdf>.

Accessed January 08, 2018.

11. Newman KL, Leon JS, Newman LS. Estimating Occupational Illness, Injury, and Mortality in Food Production in the United States: A Farm-to-Table Analysis. *J Occup Environ Med*. 2015;57(7):718-725.
12. Kitterlin M, Tanke M, Stevents DP. Workplace bullying in the food service industry. *J Food Service Bus Res*. 2016;19(4):413-423.
13. Busch C, Koch T, Clasen J, Winkler E, Vowinkel J. Evaluation of an organizational health intervention for low-skilled workers and immigrants. *Hum Relat*. 2017;70(8):994-1016.
14. Haukka E, Pehkonen I, Leino-Arjas P, et al. Effect of a participatory ergonomics intervention on psychosocial factors at work in a randomised controlled trial. *Occup Environ Med*. 2010;67(3):170-177.
15. Nielsen K, Fredslund H, Christensen KB, Albertsen K. Success or failure? Interpreting and understanding the impact of interventions in four similar worksites. *Work Stress*. 2006;20(3):272-287.
16. Trenberth L, Dewe P. Understanding the experience of stressors: The use of sequential analysis for exploring the patterns between various work stressors and strain. *Work Stress*. 2006;20(3):191-209.
17. Persson R, A.M. H, Kristinasen J, Nordander C, Balogh I, Ohlsson K. Can the job content questionnaire be used to assess structural and organizational properties of the work environment? *Int Arch Occup Environ Health*. 2012;85(1):45-55.
18. Unge J, Ohlsson K, Nordander C, Hansson GA, Skerfving S, Balogh I. Differences in physical workload, psychosocial factors and musculoskeletal disorders between two groups of female hospital cleaners with two diverse organizational models. *Int Arch Occup Environ Health*. 2007;81(2):209-220.

19. Evans BJ, Coman GJ. General versus specific measures of occupational stress: An Australian police survey. *Stress Med.* 1993;9(1):11-20.
20. Vignoli M, Nielsen K, Guglielmi D, Tabanelli MC, Voilante FS. The importance of context in screening in occupational health interventions in organizations: a mixed methods study. *Front Psychol.* 2017;8:1347.
21. Nielsen K, Abildgaard JS, Daniels K. Putting context into organizational intervention design: Using tailored questionnaires to measure initiatives for worker wellbeing. *Hum Relat.* 2014;67(12):1537-1560.
22. Brown T. Design thinking. *Harvard Bus Rev.* 2008;86(6):84.
23. Nagler EM, Pednekar MS, Viswanath K, et al. Designing in the social context: using the social contextual model of health behavior change to develop a tobacco control intervention for teachers in India. *Health Educ Res.* 2013;28(1):113-129.
24. Nielsen K, Noblet AJ. *Organizational Interventions for Health and Well-being: A Handbook for Evidence-based Practice.* Routledge; 2018.
25. Abildgaard JS, Hasson H, von Thiele Schwarz U, Løvseth LT, Ala-Laurinaho A, Nielsen K. Forms of participation: The development and application of a conceptual model of participation in work environment interventions. *Economic and Industrial Democracy.* 2018; Advance online publication:0143831X17743576.
26. von Thiele Schwarz U, Richter A, Hasson H. Getting everyone on the same page: Cocreated program logic (COP). In: Nielsen K, Noblet AJ, eds. *Organizational Interventions for Health and Well-being.* London, UK: Routledge; 2018:58-83.
27. Sorensen G, McLellan DL, Sabbath EL, et al. Integrating worksite health protection and health promotion: A conceptual model for intervention and research. *Preventive Medicine.* 2016;91:188-196.
28. McLellan D, Moore W, Nagler E, Sorensen G. Implementing an Integrated Approach Weaving Worker Health, Safety, and Well-being into the Fabric of Your Organization. Harvard Center for

- Work, Health and Wellbeing [Harvard Center for Work Health and Well-being website]. August 2017. Accessed at:  
[http://centerforworkhealth.sph.harvard.edu/sites/default/files/10.12.17\\_Guidelines\\_Screen\\_post.pdf](http://centerforworkhealth.sph.harvard.edu/sites/default/files/10.12.17_Guidelines_Screen_post.pdf). Accessed July 01, 2018
29. Stokols D. Translating social ecological theory into guidelines for community health promotion. *Am J Health Promot.* 1996;10(4):282-298.
  30. Sorensen G, Emmons K, Hunt MK, et al. Model for incorporating social context in health behavior interventions: applications for cancer prevention for working-class, multiethnic populations. *Prev Medic.* 2003;37(3):188-197.
  31. National Institute for Occupational Safety and Health. Hierarchy of Controls. [U.S. Department of Health and Human Services website]. January 13, 2015 Accessed at:  
<https://www.cdc.gov/niosh/topics/hierarchy/default.html>. Accessed June 01, 2019.
  32. Minkler M, Blackwell AG, Thompson M, Tamir H. Community-based participatory research: implications for public health funding. *Am J Pub Health.* 2003;93(8):1210-1213.
  33. Karasek R, Theorell T. *Healthy work: Stress, productivity, and the reconstruction of working life.* New York, NY: Basic Books; 1990.
  34. Murphy LA, Robertson MM, Carayon P. The next generation of macroergonomics: integrating safety climate. *Accident Anal Prev.* 2014;68:16-24.
  35. Sorensen G, Nagler EM, Hashimoto D, et al. Implementing an Integrated Health Protection/Health Promotion Intervention in the Hospital Setting: Lessons Learned From the Be Well, Work Well Study. *J Occup Environ Med.* 2016;58(2):185-194.
  36. Sorensen G, Peters SE, Nielsen K, et al. Improving working conditions to promote worker safety, health and wellbeing for low-wage workers: The Workplace Organizational Health Study. *Int J Environ Res Pu.* 2019;16:1449.
  37. Vastine A, Gittelsohn J, Ethelbah B, Anliker J, Caballero B. Formative research and stakeholder participation in intervention development. *Am J Health Behav.* 2005;29(1):57-69.

38. Gittelsohn J, Steckler A, Johnson CC, et al. Formative research in school and community-based health programs and studies: “State of the art” and the TAAG approach. *Health Education and Behavior*. 2006;33(1):25-39.
39. Creswell J. *Qualitative inquiry and research design: Choosing among five approaches*. 3 ed. London, UK: Sage Publications; 2013.
40. Green JG, Thorogood N. *Qualitative methods for health research*. 4 ed. Los Angeles, CA: Sage Publications; 2018.
41. Kitzinger J. Qualitative research: Introducing focus groups. *Brit Med J*. 1995;311:299-302.
42. Gong F, Castaneda D, Zhang X, Stock L, Ayala L, Baron S. Using the associative imagery technique in qualitative health research: The experiences of homecare workers and consumers. *Qual Health Res*. 2012;22(10):1414-1424.
43. Davy C, Magalhães LV, Mandich A, Galheigo SM. Aspects of the resilience and settlement of refugee youth: a narrative study using body maps. *Braz J Occup Ther*. 2014;22(2).
44. Holloway I, Glavin K. *Qualitative research in nursing and healthcare*. Chichester, UK: Wiley-Blackwell; 2017.
45. Schutt RK. *Investigating the Social World: The Process and Practice of Research*. 9 ed. London, UK: Sage Publications; 2018.
46. Abildgaard JS, Nielsen K. The interplay of sensemaking and material artefacts during interventions: A case study. *Nord J Work Life Stud*. 2019;8(3).
47. Maitlis S, Christianson M. Sensemaking in organizations: Taking stock and moving forward. *Acad Manag Ann*. 2014;8(1):57-125.
48. Luma Institute L. *Innovating for people: Handbook for human-centered desing methods*. Luma Institute, LLC; 2012.
49. Holtzblatt K, Jones S. Contextual Inquiry: A Participatory Technique for System Design. In: Schuler D, Namioka A, eds. *Participatory design: principles and practices*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1993:177-210.

50. Pope C, Ziebland S, Mays N. Qualitative Research in Health Care: Analysing qualitative data. *Brit Med J.* 2000;320(7227):114-116.
51. Sabbath EL, Hashimoto D, Boden LI, et al. Cohort profile: The Boston Hospital Workers Health Study (BHWHS). *Int J Epidemiol.* 2018.
52. Xu S, Van Hoof H, Nyheim P. The effect of online scheduling on employees' quality of life. *J Foodservice Bus Res.* 2018;21(2):172-186.
53. Rigotti T, Holstad T, Mohr G, et al. Rewarding and sustainable health promoting leadership (Re-Su-Lead) - Project F 2199 [Bundesanstalt für Arbeitshchurz und Arbeitsmedzin website]. 2014. Accessed at: [https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2199.pdf?\\_\\_blob=publicationFile&v=4](https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2199.pdf?__blob=publicationFile&v=4). Accessed February 31, 2017
54. Haukka E, Leino-Arjas P, Viikari-Juntura E, et al. A randomised controlled trial on whether a participatory ergonomics intervention could prevent musculoskeletal disorders. *Occup Environ Med.* 2008;65(12):849-856.
55. Abildgaard JS, Nielsen K, Sverke M. Can job insecurity be managed? Evaluating an organizational level intervention addressing the negative effects of restructuring. *Work Stress.* 2017.
56. Baron SL, Beard S, Davis LK, et al. Promoting integrated approaches to reducing health inequities among low-income workers: Applying a social ecological framework. *Am J Ind Med.* 2014;57(5):539-556.
57. Weil D. *The fissured workplace : why work became so bad for so many and what can be done to improve it.* Cambridge, MA: Harvard University Press; 2014.
58. Brown WA. *The evolution of the modern workplace.* Cambridge, MA: Cambridge University Press; 2009.

**Figure Legend**

Figure 1: Conceptual model for integrated organizational interventions.

Figure 2: Factors affecting worker safety and health and company-level outcomes

**Table Legend**

Table 1: Formative research topic areas

Table 2: Summary of Sense-Making Workshop