Feasibility of a Capacity Building Organizational Intervention for Worker Safety and Well-being in the Transportation Industry

Pivoting to Address the COVID-19 Pandemic and Social and Political Unrest in Chile

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Objective: This study developed, implemented, and evaluated the feasibility of executing an organizational capacity building intervention to improve bus driver safety and well-being in a Chilean transportation company. **Method:** Through an implementation science lens and using a pre-experimental mixed methods study design, we assessed the feasibility of implementing a participatory organizational intervention designed to build organizational capacity. **Result:** We identified contextual factors that influenced the intervention mechanisms and intervention implementation and describe how the company adapted the approach for unexpected external factors during the COVID-19 pandemic and social and political unrest experienced in Chile. **Conclusions:** The intervention enabled the organization to create an agile organizational infrastructure that provided the organization's leadership with new ways to be nimbler and more responsive to workers' safety and well-being needs and was robust in responding to strong external forces that were undermining worker safety and well-being.

Keywords: organizational intervention, healthy work design, worker well-being, organizational design, healthy leadership, occupational stress, fatigue, bus driver, scheduling, *Total Worker Health*, Latin America, participatory design

LEARNING OUTCOMES

- Describe the implementation of a capacity building organizational intervention designed to improve worker safety, health, and well-being
- Describe the barriers to implementation of an organizational intervention during the COVID-19 pandemic
- Explain the importance of worker voice in continual improvement programs in the workplace

A growing body of evidence supports *Total Worker Health*® approaches, which target the conditions of work through policies, programs, and practices to improve worker safety, health, and well-being. The pathways for worker injury, ill-health, and poor health behaviors share common root causes through the conditions of work.[1] However, organizational interventions that integrate Total Worker Health (TWH) approaches can be challenging to design and implement in practice. Working conditions, work arrangements, and labor and socioeconomic factors that impact safety and well-being can manifest differently even across companies that employ the same high-risk occupations.[2] This complexity results in the need for tailoring to fit the intervention with organizational needs and context.[2,3] The role of implementation science in the translation of interventions to different settings, industries, and across different company structures is critical to understand how effective approaches can be implemented and adapted as a result of the myriad of contextual factors that influence both the design and implementation of interventions.[4] There continues to be a need for ongoing research to better understand the implementation of organizational interventions that can be utilized in both research and nonresearch practice settings.[5–8]

The contextual factors influencing intervention design and implementation as well as the mechanisms important for facilitating change within an organization may differ across geographical boundaries due to socio-political, economic, and labor market systems.[1] The limited number of studies in Latin America means that there are large groups of vulnerable workers who could benefit from TWH approaches but who are underrepresented in the implementation of systemic organizational safety, health, and well-being interventions.[9] This highlights the need for identifying the contextual factors and intervention mechanisms and processes needed to implement organizational interventions to ensure optimal results.[10–13]

Interventions using TWH approaches are considered best practice for improving the safety, health, and well-being of workers by focusing on upstream organizational factors that prevent injury, and the policies, programs, and practices that support working conditions designed to promote optimal health and well-being.[14] Grounded in a strong evidence-based and theory, including socio-ecological and systems theories, the Center for Work, Health, and Well-being at the Harvard T.H. Chan School for Public Health (Center) developed a conceptual model to illustrate the influence of upstream policies, programs, and practices on working conditions, which in turn affect worker safety, health, and well-being.[1] This model illustrates how factors external to an organization impact the conditions of work. These factors may include changes in employment and labor patterns (eg, employment stability, contractual relationships between companies and their clients, multiemployer workplaces, changes in worker protections, and the acceptance of worker voice as an important indicator

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of workers' perspectives). Additionally, the socio-political-economic environment may be a factor influencing how organizations adopt and adapt TWH approaches (eg, technology advancements, changing distribution of diseases, social inequalities, and policy and regulatory frameworks). Changes in these external contextual factors are often accompanied with uncertainty and stress within an organization. While the importance of the impact of these contextual factors on intervention delivery and evaluation has been documented by Nielsen et al and others,[6,8,15] much less has been documented on how organizations adapt an organizational health and well-being intervention during a time of crisis, such as during political and social unrest, such as what occurred in Chile in 2019 and 2020. In October 2019, protests were initiated in major cities in the country as a response to social inequalities, their magnitude was so great that they were termed Chile's "social outburst" as millions protested in the streets for several weeks. In March 2020, the World Health Organization declared a global COVID-19 pandemic.

In recent times, there have been calls for translational research focused on adapting and implementing organizational interventions that improve worker safety and well-being using a TWH approach. Based on this need, the Center developed evidence-based open-source resources, technical guides, and implementation guidelines that provide a TWH framework for organizational interventions designed to improve worker safety, health, and well-being.[16]

In this study (named the "On Board" study), we add to the existing literature by focusing on building capacity within an organization to implement the intervention activities themselves using the Center's Implementation Guidelines. Organizational capacity building, in this context, is defined as the development of knowledge and skills (through training and technical assistance) as well as the internal resources needed to enable organizational capability to implement the *On Board* program independently and over time and consistent with an integrated approach to safety and well-being protection and promotion.[17] By focusing on capacity building from the outset, we hope to truly integrate the TWH principles into a company's management systems and foster intervention sustainability. Few studies have explored the use of a capacity building approach; many rely on research teams or external third-party providers to deliver intervention activities during the intervention period. Pronk et al successfully used a capacity building approach in collaboration with a large health and well-being vendor using the Center Guidelines as the foundation for the intervention.[17] The vendor provided trainings, resources, and technical assistance to advise multiple companies on implementing a TWH approach. They found that the guidelines were easily adapted, and the capacity building intervention approach was feasible and accepted by companies.

This study focuses on a group of professional bus drivers, workers who have been largely understudied yet face high risks to their health and well-being on the job. Professional drivers suffer from a cadre of acute and chronic health issues at higher rates than the general working population,[18,19] including increased risk of cardiovascular disease,[20–22] obesity,[23] and musculoskeletal disorders.[18,24–27] They are exposed to hazards in their work environment and job design, which have been found to be detrimental to their safety, health, and well-being including irregular work shifts, long hours of driving, sedentary restricted postures, whole body vibration, noise, and chemical exposures.[28–34] Work environment factors also influence the health behaviors of the drivers, such as their diet, fatigue and sleep, tobacco, and substance use; for example, long working hours pose challenges for regular sleep patterns, and limited food choices and physical activity when driving. Additionally, psychosocial factors such as stress of staying on schedule and dealing with traffic patterns and passengers might exacerbate driver health and well-being concerns. There is a dearth of studies examining the safety and well-being risks for Chilean transportation workers. In our previous qualitative interview study with bus drivers in Chile, we found that fatigue and job stress were perceived to be associated with accidents and chronic health conditions through various pathways.[35] These included psychosocial stressors such as driver-to-driver, passenger-to-driver, and driver-to-supervisor relationships; issues with shift scheduling and route allocations; physical environment challenges such as poor road quality and inclement weather; high job demands such as high cognitive demands, focus and attention, long work hours, long hours in sedentary sitting with exposure to seat and steering wheel vibration; and poor health behaviors caused by lack of access to healthy dietary options on the road, lack of physical activity due to fatigue after work and the need to sleep, and higher rates of smoking.

The primary purpose of this study was to develop, implement, and evaluate the feasibility of executing an integrated organizational capacity building TWH intervention targeting drivers' safety and well-being.[17] A feasibility pilot study was considered the optimal design as our study's goal was to explore the implementation of the Center Guidelines using TWH approaches in the Chilean context in an industry with high risk for injury and fatality. After the social and political unrest and the COVID-19 pandemic unfolded, a secondary goal of this paper became to evaluate how the intervention adapted due to these external events and to describe the impact of these events on intervention implementation and the study's findings. Using both qualitative and quantitative process evaluation data, our paper answers three research questions related to the feasibility and implementation of this organizational intervention:

(1)What perceived benefits did the key organizational stakeholders (drivers, supervisors, and company leadership) observe with respect to drivers' safety, health, and well-being because of the intervention?
(2)What were the contextual factors, both barriers and facilitators, to implementing an organizational worker safety, health, and well-being intervention in the transportation industry?
(3)What intervention mechanisms were necessary to build capacity in the organization for successful implementation?

This study provides insight into the process of implementing a TWH organizational capacity building intervention while navigating rapid changes in the political and economic environment in Chile during a time of social unrest and the COVID-19 pandemic. The findings of this study also have relevance for organizational change efforts in future times of uncertainty and unrest.

METHODS

Study Design and Hypotheses

The *On Board* Study used a feasibility pre-experimental study design.[36] We tested an *a priori* hypothesis that an organizational capacity building intervention, using the Center Guidelines, and based on a participatory TWH approach that targets the conditions of work, would be able to be adapted and successfully implemented in a high risk for injury and ill-health sector in a country that has limited experience with a TWH approach. Furthermore, we also hypothesized that the process for addressing worker safety, health, and well-being using the guidelines transcends context when the following fundamental characteristics—as determined by previous implementation studies of organizational interventions[2,16,37,38]—are present:

a) leadership commitment and support for developing, implementing, and sustaining the intervention,
b) using data to drive change that targets working conditions that are impacting worker health and well-being,
c) tailoring the intervention to fit organizational contexts,
d) enhancing worker voice through psychologically safe reciprocal communication mechanisms to co-design strategies and provide

ongoing feedback and evaluation (i.e., participatory intervention design), and
e) focusing on upstream solutions that are supported by changes in policy, programs, or practices.

Lastly, while our study was not designed to examine efficacy, we used qualitative data to explore key stakeholders' perceptions on intervention and implementation and the perceived benefits (if any) of the intervention on both organizational and worker health and well-being and participant's reflection related to the capacity building process and the organization's ability to continue the program once the research project was completed. During the study, delays in specific implementation activities and data collection were experienced because of the social and political unrest in Chile starting in October 2019 and the COVID-19 pandemic starting in March 2020. These challenges have been reported by many conducting research during this time.[6,39–41] In the results, we discuss how these broader social, political, and economic contextual factors influenced adaptation of the intervention and its implementation.

Study Setting

Chile provides a unique global context developing and testing TWH interventions. In 2020, Chile had over 6.5 million documented workers employed by over 1 million companies covered by accident and occupational disease insurance.[42] Of these, about 17,990 companies were engaged in road freight transportation with fleets of over 217,000 vehicles.[43] Of these, 6.4% (410,900 workers employed by 46,607 companies) are in the transportation sector.[42] The accident rate for this sector in Chile is significant, and much higher than the general working population: in 2019, rates were 3.8 per 100 workers, and in 2020, 3.3 per 100 workers. Fatality rates are even more startling: 11.4 per 100 workers in 2019, and 9.3 per 100 workers in 2020.

The study was conducted from 2018 through December 2020 in collaboration with a medium-sized privately owned Chilean bus company and Mutual de Seguridad CChC Chile (Mutual), a nonprofit private commercial insurer in the Chilean Chamber of Construction.

Transportation Company

The bussing company, located in a regional urban center, employed approximately 450 drivers and supervisors when the intervention commenced. The company was contracted by a client company to transport workers to a remote worksite in the mountain range 60 km (approximately 37 miles) away from the urban center. The contractual nature of the agreement between the company and its client was renewed every 2 to 3 years for services to transport workers and subcontractors to a remote worksite for multiple shifts daily. The client company's workers live in their own urban communities and are picked up before and dropped off after their work shift at the remote worksite. Drivers are exposed to roads that are unpaved and at an altitude of greater than 1500 meters (nearly 5000 feet) above sea level. One scheduled route may take up to 2 hours from the company to the client's worksite. Drivers work shifts to accommodate the schedules of the client company's workers. Shift times are coordinated so that drivers can deliver workers to the worksite before they start their shift (eg, morning shift), and transport workers home after they complete their shift (eg, night shift) in a single round trip. Drivers operate either large busses which transport upward of approximately 30 passengers per bus or smaller busses which act as a concierge service for employees with around 10 passengers.

Mutual de Seguridad CChC

Mutual provides insurance to employers, for example workers' compensation and health benefits, and helps employers prevent injury risk (*see* www.mutual.cl). Their mission is to add value to companies and their workers by protecting against injury risk, promoting safe work environments and a culture of safety and health, and improving the quality of life of workers. This vision strongly aligns with *Total Worker Health* principles and that of the Center, and also with the goals of the participating company. This study was made possible by funding from Mutual de Seguridad CChC through a public competitive grant process organized by the Superintendencia de Seguridad Social, Chile through Mutual CChC.

Process Evaluation

Because of the exploratory nature of the study, we conducted a mixed-methods process evaluation designed to document the implementation process and to gather perceptions from senior leadership, supervisors, workers, and other key stakeholders at the bussing company.

Following the principles of process evaluation,[44] we analyzed process tracking data which monitored reach, acceptance of the intervention, and intervention fidelity, i.e., the extent to which the intervention was implemented as intended. We documented every contact with the company, what was discussed at steering committee meetings, implementation of the intervention activities by the company, and technical assistance. The research team documented contextual factors influencing the implementation of the intervention as well as deviations and adaptations to the intervention approach, activities, and strategies.

Interviews were conducted after intervention implementation to assess the context of intervention implementation and to explore barriers and facilitators of intervention implementation and organizational change. The research team conducted a total of 23 interviews with key informants in the company including steering committee members and bus drivers; two of these interviews were conducted with two informants present. Interviews were conducted with representatives from upper leadership, supervisors, and drivers who participated in an hour-long videoconference interview. The interviews were conducted in Spanish by an experienced qualitative researcher using a predesigned semistructured interview guide. Questions focused on awareness of the *On Board* Program, perspectives on changes made, barriers and facilitators to the intervention, and opinions on sustainability of the program. Interviews were audiotaped, transcribed, and translated into English. Transcripts were coded using methods based on both template analysis and Gioia methodology for organizational research[45,46] by two independent coders (GH and SEP) and then analyzed thematically. We started with a predefined coding tree based on our conceptual model but allowed for new codes to be added inductively as new themes arose in the data.

Quantitative worker survey data was collected both before (March 2019) and after (December 2020) the intervention. Final data collection was delayed because of the COVID-19 pandemic and the limitations placed on conducting research during this time. We evaluated changes in working conditions over time, and self-reported health and well-being in a representative sample of drivers. Drivers were recruited to complete the survey by selecting a random sample of shifts over a week; all drivers that completed those shifts were invited to voluntarily participate and complete the survey. One hundred forty-seven drivers completed the survey at baseline and 94 of these same drivers completed the survey after intervention (Table 1). This represented approximately one-third of the drivers who were employed at the company; the same participants were sampled at follow-up capturing about 64% of the baseline drivers who completed the survey. All drivers at the company identified as men, hence the all-male sample. At baseline, 85% were drivers of large busses (n = 126), and 90% at follow-up (n = 87) (nb, this is likely due to a loss of a contract for drivers of small busses during the intervention period). The average tenure of the drivers was high at an average 15 years and the range of tenure was less than 1 month to 48 years.

Preintervention surveys were completed using paper surveys, which contained questions to capture key demographic information

TABLE 1. Demographics of Drivers Who Completed the Survey

	Preintervention					Postintervention				
	n (%)	Mean	SD	Min.	Max.	*n* (%)	Mean	SD	Min.	Max.
Male	147 (100)					90 (100)				
Age		51.6	9.9	29	73		51.9	8.8	33	70
Months worked for company		180.4	138.7	0	574		165.6	103.5	21	540
Hours worked weekly		56.9	19.7	8	96		51.7	15.5	8	100

of the drivers, as well as drivers' perceptions of their working conditions and safety, health, and well-being outcomes. All data were entered manually, and quality checked. Postintervention surveys were collected using both paper and electronic methods. In the follow-up survey, the same preintervention survey was administered with additional questions that assessed drivers' perceptions of the intervention. First, drivers' awareness of changes to working conditions was examined, and second, their satisfaction with these changes. We also measured the average number of hours worked each week, and drivers' perspectives of their safety at work, and their general well-being measured using the valid and reliable WHO Well-Being Index.[47] To test for pre-post differences, survey data were analyzed using SPSS (IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp). Descriptive statistical analyses were conducted for demographic and outcome variables. Because of the skewed nature of the outcome variables—as observed graphically and Kolmogorov-Smirnov tests reaching significance ($P < 0.05$)—nonparametric analysis were most suitable to provide crude estimates. Wilcoxon signed ranked tests were performed for ordinal and continuous variables.

INTERVENTION

The intervention was a continuous improvement process using participatory and TWH approaches based on implementation guidelines developed by the Center.[16] The intervention focused on improving the conditions of work as the root causes of worker safety, health, and well-being issues, by implementing company/workplace policies, programs, and practices designed to both protect and promote worker safety, health, and well-being. While the Center Guidelines can be applied in any company, in any sector, they require tailoring to translate to specific organizational contexts, goals, and health and safety needs. We used TWH principles,[48] as well as several interdisciplinary theoretical perspectives, including social ecological theory, social contextual models for behavior change, the NIOSH TWH hierarchy of controls, and community-based participatory research.[49–51] The Center Guidelines describe a continuous improvement cycle based on the Plan-Do-Study-Act model, enhanced by a strong focus on employee input and participation, and include activities that utilize the four phases of implementing an integrated approach (Table 2).

Our primary goal was to build capacity within the company to conduct the *On Board* program activities independently with the research team providing periodic, or as needed, technical assistance. Thus, the activities of the researchers focused largely on providing capacity building activities, such as training, to the *On Board* steering committee and intervention champions from the company as well as later technical assistance. Of note, two of the project champions had previously attended a TWH training over 2 days sponsored by Mutual and co-delivered by one of the authors (JTD). To guide the intervention, we developed a logic model for the intervention design and implementation (Fig. 1).

1) Engaging Leadership Commitment and Collaborators

For approximately 6 months prior to the intervention phase, Mutual and the Center conducted several preparatory activities and meetings with the company to (i) obtain commitment from the company to conduct the *On Board* Program and research study, and (ii) exchange information and company-related data to prepare for the implementation of the *On Board* Program. A kick-off with the company leadership occurred in July 2018 in which a series of virtual presentations and meetings were conducted with key stakeholders from the company. The purpose of these meetings was to obtain commitment from all levels of company leadership as well as a commitment from key stakeholders (eg, workers' union representatives) to participate in the program.

2) Planning: Using Data to Drive Change

A needs assessment was conducted consisting of key stakeholder interviews and worker focus groups to identify potential working conditions that would be the targets for the intervention. This process and its findings are described in full in Peters et al.[35] The company also provided historical deidentified data related to injury risk, and the health and health care utilization of their workers. These data were analyzed and a report for the company was generated that outlined the findings of the needs assessment (due to our collaborative agreement with the company these injury and health data cannot be reported in this publication).

3) Implementation: Building Capacity

A steering committee was formed and was responsible for the primary intervention activities. The committee consisted of 10 members including senior leadership, supervisors, workers, and union representatives. The steering committee was responsible for:

- Overseeing *On Board* Program
- Reviewing the needs assessment report and prioritizing working conditions to focus on during the *On Board* Program
- Developing action plans focused on policies, programs, and practices to improve working conditions
- Implementing the strategies or making a plan for strategy implementation
- Ensuring worker participation during the *On Board* Program, including developing communication infrastructure
- Ensuring leadership commitment was maintained and obtaining resources to support the initiatives
- Executing systems processes to facilitate the long-term sustainability of the *On Board* Program after the research study

Within the committee, two project champions were nominated to chair the committee meetings, be responsible for facilitating the programs activities, act as a liaison with the company's senior leadership, secure resources to implement strategies, and provide a conduit between the company and the research team for accessing technical assistance. The steering committee met regularly through the entire intervention period to prioritize areas for improvement, develop action plans, communicate with workers and leadership, and consider the sustainability of the program. A qualitative researcher attended the steering committee meetings to document the process and identify contextual factors influencing implementation.

For the launch of the *On Board* program, the research team spent a week onsite with the company providing training and facilitating the launch of the intervention in partnership with the company (Table 3).

TABLE 2. Phases of the Integrated TWH Approach Based on Center Guidelines[16]

Phase	Brief Description From the Implementation Guidelines
1. Engaging leadership and collaborators	Buy-in and collaboration from across the company are imperative. Obtain top leadership support early on, encourage collaboration, work closely with middle supervisors, and give workers opportunities to participate.
2. Planning	Develop a clear plan. Define the goals and objectives of the intervention. Prioritize working conditions, gather, and analyze relevant worksite data, select strategies, create action plans, and identify resources required to support successful implementation.
3. Implementation	Changes to policies, practices, and programs to support changes to working conditions by implementing the defined strategies and action plans. To facilitate implementation, start with an easily actionable strategy to garner worker support, develop processes for regular communication with key stakeholders, and conduct any relevant training.
4. Evaluation and continual improvement	Monitor and analyze data to measure success and for continual improvement. Evaluate change and program effectiveness using a variety of data collection methods.

During this stage, the steering committee prioritized two of the working conditions identified from the needs assessment. The prioritized areas included: (1) addressing problematic schedules and routes and (2) enhancing communication, support, and trust between drivers and supervisors. We then conducted two workshops, one with workers and one with supervisors, facilitated by a member of the research team. A modified fish-bone workshop technique, previously described by Ipsen et al, was used (3). The purpose of the workshops was to explore the prioritized working conditions so that we could (a) understand how each working condition manifests for the drivers day-to-day and (b) obtain drivers' perspectives on strategies that might be feasible to improve these working conditions. Using this technique, the team first brainstormed strengths and opportunities for improvement and then focused on how strengths could be used to address the areas that needed improvement. The drivers' workshop primarily focused on scheduling and routes, and the supervisors' workshop focused on building a culture of trust and support between the drivers and supervisors. These workshops yielded important qualitative information that described the specific issues in greater depth and identified possible solutions and ways to evaluate if the implemented strategies were successful. These activities were designed in a way to demonstrate to the company how workers can be engaged in the identification and planning of an intervention using participatory approaches.

4) Implementation: Providing Technical Assistance

The steering committee was responsible for continuing and sustaining the intervention activities at the company. The research team met virtually through videoconferencing with the project champions to provide technical assistance and document the progress made between meetings. The goal was to meet every month; however, this was not always achieved especially after October 2019 due to the social and political unrest in Chile and then the COVID-19 pandemic.

The steering committee successfully implemented strategies designed to improve the prioritized working conditions. Over the next 12 months, the steering committee developed and implemented action plans based on these priority areas. Regular communication through various mechanisms were built into the program to provide a continuous feedback cycle with workers about the implemented changes and ongoing input. The intervention resulted in changes to organizational policies, programs, and practices surrounding schedules and routes, vacation policies, and communications between dispatchers/supervisors and drivers.

RESULTS

The intervention was successful in building the capacity of the project champions and steering committee to integrate a TWH approach into their business and health and safety management systems. Before the social and political unrest and the COVID-19 pandemic, the company addressed their prioritized areas and implemented the following strategies focused on improving the conditions of work (Table 4). Quantitative and qualitative data supported that these changes were overall received favorably. In this section, we will extrapolate on the implementation process by answering our three key research questions related to the feasibility and implementation of this organizational intervention using data collected from the process evaluation, postintervention interviews, and worker surveys.

(1) ***What perceived benefits did the key organizational stakeholders (drivers, supervisors, and company leadership) observe with respect to worker safety, health, and well-being because of the intervention?***

Drivers' Awareness of the on Board Program

Using survey data, we identified that drivers were generally aware of the *On Board* Program (90%). Most drivers were also aware of the changes made to working conditions, as described in Table 4: 51

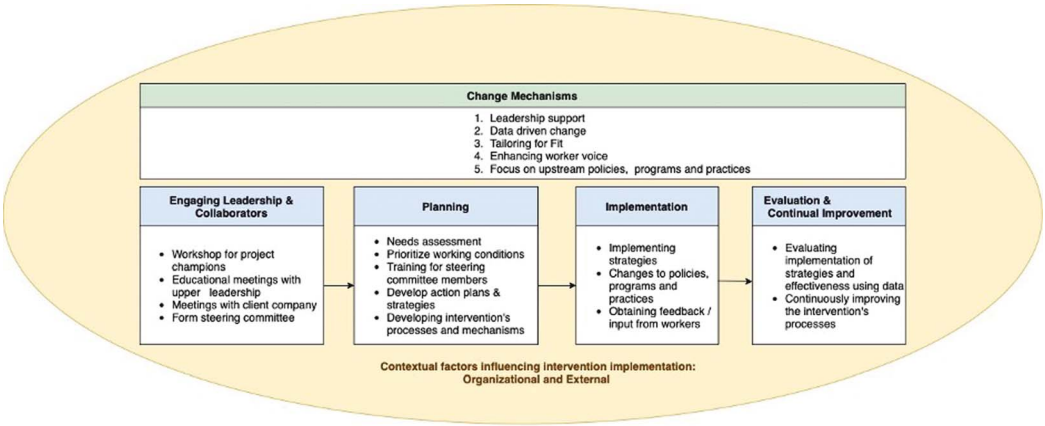

FIGURE 1. Intervention design and implementation model.

TABLE 3. Overview of Activities for the Program Planning Week Conducted in March 2019

	Activities	Description
Day 1	Meeting with project champions	Overview of the activities and *On Board* Program
	Training with steering committee	(1) Training steering committee on roles and responsibilities, program activities, and processes; (2) Review of formative research report and prioritizing working conditions for the *On Board* Program
	Tour of company	Familiarize the Center team with existing health, safety and well-being policies, programs and practices
	Meeting with leadership	(3) Overview of the activities and *On Board* Program; (4) Ensure ongoing commitment and buy-in
Day 2	Center team shadowed a bus driver for an entire day	Ethnographic methods to observe a day-in-the-life of a bus driver at the company
Day 3	Workshop with drivers Workshop with supervisors	To understand how working conditions manifest and to identify potential strategies from employees' perspectives
	Meeting with project champions	To review progress made and make plans for next steps
	Meeting with steering committee	(1) Review findings from workshop (2) Commence action planning (3) Discuss worker communication plans
Day 4	Meeting with client company	One priority area required the client company to be involved. Thus, a meeting was established to discuss joint objectives and to develop **collaborative strategies** with the client company.
	Meeting with steering committee	Continue action planning and review communication plans
	Meeting with leadership	Review week's progress and discuss next steps
	Meeting with project champions	Sustainability planning and future technical assistance provision for the *On Board* Program

and 46%, respectively, were aware of changes made to scheduling and bus routes, and 61 to 67% were aware of increased support received from their supervisors (Table 5). Forty-two percent of drivers also reported improved communication with their supervisor (with 20% reporting that communication had remained unchanged), and 56% observed increased opportunities to provide feedback through the new communication initiatives to increase worker voice.

These data were reinforced through the qualitative interviews conducted with key informants and drivers describing the positive change in the company's culture of health and well-being. For example,

> "Yes, they have improved a lot, they have changed their way of seeing things…. I've realized that there are many things that have improved here, and the management has taken care to make all those improvements, and that is good for everyone…. You can talk to them more, now it is more accessible, before it was less accessible." Driver #4

Perceived Effectiveness of the on Board Program

When asked to reflect on the time before the program to now, drivers reported that overall they were generally satisfied with the changes made to working conditions as a result of the *On Board* Program (Table 6): 53% were satisfied with changes to schedules, 71% were satisfied with changes made to the bus routes, 68% were satisfied with the support they receive from their supervisor, 65% satisfied with support from dispatcher, 66% were satisfied with the communication mechanisms instituted, 69% were satisfied with the company's responsiveness to concerns identified, and 68% were satisfied with how workers and supervisors were now working together to address worker health concerns.

Using preintervention and postintervention survey data, we also observed an overall improvement in work hours from a median average of 59.4 hours per week to 51.6 hours ($Z = -2.565$, $P < 0.01$).

Qualitatively, key informants also reported positive impacts of the program on improving working conditions. Improvements to the targeted working conditions were viewed as one of the most important outcomes of the *On Board* program, as well as the implementation of a process into existing safety management systems that allowed for continuous improvement.

Unexpected outcomes of the *On Board* program were also reported. These included expanding the leadership teams' perspectives on the added benefit of expanding their view on workers' safety and health to also include well-being more broadly. Some of the key informants described how the program expanded their thinking about the occupational safety and health paradigm to include worker well-being, and how this could apply to their other safety initiatives.

> "The [On Board] program is more ... it is more extensive, I do not see it only as safety and health, that is why the program has 3 focuses: safety, health, and well-being. For example, safety programs are very traditional, in that they are carried out and are based on prevention tools, preventing people from getting in accidents, or making people sick, but this project goes a little further. For example, in a safety program, you are not going to analyze the "routes and schedules", but within the framework of this project, even though it is about safety, health, and well-being, it is within the framework of that well-being that you begin to analyze how these "routes and schedules" impact workers. That for me fits very well with safety programs but also goes beyond safety programs." Supervisor/Supervisor #1

Impact of Changing Routes and Schedules (Prioritized Working Condition #1)

The company collected data on the number of drivers completing back-to-back long routes. Key informants reported that this reduced considerably because of the new policies that they had implemented, as well as the changes made to the routes. This resulted in fewer work hours (which was also observed in the survey findings). Company management reported that on any one day around 95% of drivers were not completing back-to-back shifts on that day, and over 50% were not completing back-to-back shifts of the challenging routes (with a goal to continue improving this so no drivers would be completing back-to-back shifts). Data provided by the key informants showed that prior to this policy change, on average about 16 drivers every day were completing back-to-back routes. However, after the change was implemented, on average, four drivers were completing back-to-back shifts each day (data provided from June 2019 to April 2020).

> "Well, it has had an impact. We started this in March or April last year. We were meeting periodically to review the statistics and I was getting–every month–a figure of how many times the driver [completes a back-to-back route] in the month…. We made an algorithm that was checking that the driver who was scheduled (for the challenging routes) the day before, on the

TABLE 4. Strategies Implemented to Improve Prioritized Working Conditions

	Goal	Strategy	Organizational Outcome*	Communication to Workers
Route length changes & modification to routes	Reducing the length of the most challenging route to make it shorter and more manageable.	A different, shorter, more manageable route was created to cover a portion of the challenging route to make the challenging route shorter. This also resulted in other "routes" being changed.	The return route (most difficult portion of the trip) was shortened by 20 minutes by dividing this route into two routes. This resulted in workers returning back from their shift earlier and having more recovery time between shifts. As part of these changes, a road was paved for the new route—this created benefits to workers and also the community.	Changes to the challenging route were communicated during the worker communication trainings since all/most workers attended. Other mechanisms included communication billboards throughout the traffic offices in [city] and the [work location], and advisements by union officials.
Scheduling of routes	No driver drives the return route from the challenging routes twice in 1 day, nor does any driver drive the return route 2 days in a row.	Scheduler manually reprogrammed the schedules to make these changes.	No driver drives the challenging route twice in 1 day, nor does any driver drive the return route 2 days in a row (with few exceptions).	Changes to the challenging routes were communicated during the worker communication trainings since all/most workers attended. Other mechanisms included communication billboards throughout the traffic offices in [city] and the [work location], and advisements by union officials.

*Desired outcomes were operationalized by the steering committee during the action planning process and were used as indicator of success.

next day of his schedule, would not have that route again - he would not have it for two days in a row. We kept checking how they were doing every month. What we were seeing with the data is that it had significantly reduced." Key informant #6

Informants and drivers described how improved schedules had resulted in a reduction in job stress, shorter work hours, longer rest breaks between shifts, and more leisure time spent with family. Drivers reported how the changes to the schedules and routes had given them time back in their day, even if it was just a few more minutes.

Impact of Supervisor Communication and Leadership Training (Prioritized Working Condition #2)

Drivers reported that communication had improved between the drivers and their supervisors. Supervisors felt that communication had improved overall.

"Yes, it has totally improved, because now there is more dialog with the drivers, all the issues are discussed." Supervisor/ Supervisor #3Those interviewed stated that overall 'trust' between the drivers and supervisors was the outcome that had improved the most and was perceived to have contributed to safety outcome improvements seen within the company. Company leadership reported that they had seen improvements with respect to safety administrative data that they routinely collect. For example, reporting of the Emergency Code (a code that is activated when drivers feel symptoms of illness or drowsiness or any other factors that prevent them from continuing to drive safely) was being used more often. This increase was attributed to drivers feeling more comfortable with their supervisors, speaking up, and using the code.

"For a driver to apply (the Emergency Code), one of the conditions that must be generated is trust, because in the culture of drivers at the beginning, applying (the Code) was like 'weakness', it is 'I don't want to apply (the Code) because they can challenge me, I can receive a warning letter' or the other drivers, colleagues can harass me, etc. And today statistically the Emergency Codes have increased and that also indicates, or I correlate it with the drivers' confidence levels…. And the other thing is a crash or collision at low speed and with minor consequences, that you hit a containment barrier or whatever. This statistic has also decreased and perhaps it is also part of the same efforts that we have made in matters of safety and health." OHS Supervisor #1

(2) ***What are the contextual factors, both barriers and facilitators, to implementing an organizational worker safety, health, and well-being intervention in the transportation industry?***

Several themes surfaced in the key informant interviews that identified both barriers and facilitators to implementing the intervention and for improving the acceptance of the program and its components with drivers. This is important as previous studies have found that workers' poor acceptance of a program can limit its effectiveness and sustainability long-term.[52]

Barriers to Implementation

Barriers identified were generally caused by external factors posing additional challenges for implementing the intervention and requiring the company to prioritize new safety, health, and well-being challenges that arose during the study period. The first two barriers were focused on the additional challenges and pressures placed on drivers and the company due to (a) social and political unrest in 2019–2020, and (b) the COVID-19 pandemic. While still dealing with

TABLE 5. Drivers' Perspectives of the on Board Program

	No *n* (%)	Yes *n* (%)	Not Sure *n* (%)
Awareness of the *On Board* Program	6 (6.6)	90 (93.4)	0
Awareness of scheduling changes	23 (24.0)	49 (51.0)	24 (25.0)
Awareness of changes to bus routes	32 (33.7)	44 (46.3)	19 (20.0)
Aware of increased support from my supervisor	21 (22.6)	57 (61.3)	15 (16.1)
Aware of increased support from my dispatcher	20 (20.8)	64 (66.7)	12 (12.5)
Aware of increased communication with supervisor about performance	36 (37.1)	41 (42.3)	20 (20.6)
Increased opportunities for drivers to inform supervisors and supervisors about work-related safety and health concerns	22 (22.9)	55 (57.3)	19 (19.8)
Company seeks drivers' input and feedback on safety and health concerns	23 (24.0)	56 (58.3)	17 (17.7)
Company is responsive to address drivers' safety and health concerns	17 (17.5)	58 (59.8)	22 (22.7)
Supervisors and drivers work together to improve driver safety and health	20 (20.8)	55 (57.3)	21 (21.9)
Aware of communication from management about new changes that have been made to improve drivers' safety and health	14 (14.6)	61 (63.5)	21 (21.9)

the social and political unrest, the COVID-19 pandemic hit; both events propelled the company to focus on health and well-being effects on drivers and their clients, taking focus away from the prioritized working conditions that were initially the focus of the intervention. However, extensive work focused on these working conditions had already been done and was maintained. The Program enabled the company to pivot and focus their efforts on the new health and safety challenges that arose during this time. Key informants described how strategies, especially those focused on routes and schedules were not fully implemented because of the October 2019 demonstrations and the overlapping start of the COVID-19 pandemic. Supervisor training efforts had fortunately been completed prior to the social unrest, providing supervisors with knowledge and skills to cope with the additional challenges placed on them because of these events. Every key informant and driver interviewed described the large impact these events had on the company's efforts to maintain the *On Board* program focused on the predetermined working conditions.

> "Well for us it was super complicated because there came a time when the demonstrations were overflowing, and we had to support the drivers …. There were patrols riding the streets where they could pass, in detours; if we had an injured driver we had to take all actions to replace him. It was super difficult because we were suddenly in demonstrations that we didn't even realize and we were in the middle, but at no time did we stop our functioning and we could not stop the normal operating process of (the host company). Therefore, we moved forward, with a lot of effort and a lot of sacrifices, not only ourselves but also of our drivers who were there at the front…. The replacement of vehicles mainly by broken glass because of stoning. We also had some drivers who we"e "shoc"ed" by a large mass of people who attacked them, so there were complicated moments for both us and them..." Key informant #4Drivers also described how these events impacted their overall mental well-being. For example, due to Covid-19 social distancing measures implemented, drivers felt isolated from other drivers and their supervisors: *"On a personal issue, more than anything, the relationship and closeness with the leadership, which was before good ... well, at the beginning (of the pandemic), in the company there was a lot of closeness, and then that was lost due to the issue of distance in a pandemic, we are now more alone than ever." Driver #7*

This also impacted the ability for the steering committee to meet in person.

Impact of Contract Work

The company functions by entering contracts with their clients to transport the client's workers to and from work. The contractual relationship between the two companies resulted in a power dynamic. The contract between these two companies was renewed every 2 to 3 years. At the beginning of the *On Board* Program, one of the contracts had been lost and about 30% of the driver workforce needed to be terminated. One of the supervisors described that when the project was starting the company was also working at rebuilding morale, and never lost sight of the benefits that they perceived the program would bring: *"So that was like… when you start a process with that group (of drivers), obviously the organization is a little in the doldrums, and we had to rebuild ourselves along the way." Supervisor #2*

TABLE 6. Drivers' Satisfaction With Changes to Working Conditions

	Satisfied *n* (%)	Neutral *n* (%)	Dissatisfied *n* (%)
Satisfaction with changes to schedules	50 (53)	33 (35)	11 (12)
Satisfaction with changes to bus routes	65 (71)	21 (23)	5 (6)
Satisfaction with the ability to take vacation at a convenient time for driver and their family	25 (27)	30 (32)	39 (41)
Satisfaction with support from supervisor	64 (68)	23 (25)	7 (7)
Satisfaction with support from dispatcher	61 (65)	25 (27)	8 (8)
Satisfaction with communication with supervisor about performance	52 (55)	26 (27)	17 (18)
Satisfaction with opportunities for drivers to inform supervisors and supervisors about work-related safety and health concerns	62 (66)	26 (28)	6 (6)
Satisfaction with the ability to provide input and feedback on safety and health concerns	62 (66)	26 (28)	6 (6)
Satisfaction with company's responsiveness to address drivers' safety and health concerns	64 (69)	25 (27)	4 (4)
Supervisors and drivers work together to improve driver safety and health	64 (68)	26 (28)	4 (4)
Satisfaction with level of communication from management about new changes that have been made to improve drivers' safety and health	64 (68)	24 (26)	6 (6)

Another contract negotiation was taking place at the time of the final data collection, which was front-of-mind during the final interviews. Key informants and drivers also highlighted that two of the working conditions, schedules and routes, could not be changed without the permission of the client company so there was a need to ensure that the client also saw this change as a benefit to them. During the intervention planning, the transportation company brought in the host company to discuss expectations and potential solutions for the longer routes. The two companies had a shared goal as the client company also saw issues with longer routes for the workers being transported as well. Due to engaging the client company in the intervention early, the client was amenable to these changes. However, this extra layer of gatekeeper permissions did pose additional challenges and delays despite the good relationship between the two companies to address the longer route issue.

Facilitators for Successful Implementation of the On Board Program

Factors affecting the successful implementation of the intervention and to what extent it was perceived positively by workers included: (a) consistent and responsive reciprocal communication mechanisms that provided (b) real-time worker voice in ways that empowered workers rather than penalizing them for speaking up, and (c) leadership support with resource allocation to the *On Board* Program.

Importance of Reciprocal Communication

Key informants and drivers described the importance of continual improvement with consistent and responsive communication loops that ensured that changes to improve working conditions were in the best interests of the workers. Through the strong communication mechanisms established, several new areas were identified that required further improvement. Examples included the issue of passengers requesting nonauthorized drop-offs, which caused routes to lengthen, and further exploration of additional routes continuing to cause stress for drivers. If not addressed, these would continue to cause dissatisfaction for drivers. An example provided by two supervisors:

> "I think [before the On Board Program] we lacked a little in monitoring of changes that we implemented. Now, we managed to modify the routes, we managed to get people to arrive at their house earlier, but yes, for example, on the subject of repetition of the number of routes that you had in the month, we had basic rules that selected drivers one by one, but we would not have delved further into that issue, in terms of the number of repetitions that that route had, for example… So, when the drivers complained that the bus has to stop at every corner to drop off passengers, versus having established stops to make the flow faster. This we would not have known." Supervisors #4 and #5The company has continued using these communication mechanisms successfully and attributed this intervention mechanism to their successful and rapid response to implementing nationally required COVID-19 policies and practices. For example, based on what they were learning from workers, they recognized the importance of providing workers with clear and prompt communications as to what was happening during the pandemic. Leadership developed a series of informational videos for employees on new policies and practices implemented, for example, washing hands, mask wearing, disinfecting surfaces and social distancing, and motivational videos to improve worker morale and express the value that the company provides to the community—providing them with a meaning and purpose for working during this time.

Worker Voice

Obtaining the voice of the workers to identify work-related safety, health, and well-being concerns was viewed as a key facilitating mechanism for informing health and safety intervention targets. This was attributed to the success of the *On Board* Program, as indicated by both key informants and drivers:

> "The opinion of the workers is absolutely important to make the changes since they are the ones who are seeing the problem on the ground, they are detecting the deviation or weaknesses that we could have. Then they can give us feedback with their opinions and we can improve." Supervisor #2"In other words, the participation of drivers allows you to reduce the gap between what you believe and what is happening, because many times you are in the field of planning, programming, and everything, and you often have a certain perception of reality but, if the person who is there, the operator on the front line tells you ... Of course then you can really bridge the gap that exists between imagined work and real work." OHS Supervisor #1

> "Yes, it is always informed when there is something that is going to be implemented, something new, everything is disseminated, they bring us together and inform us about what is being discussed." Driver #1

Leadership Support and Resource Allocation to the *On Board* Program's Strategies

Another important contributor to the success of the intervention was the leadership support that was provided from the company's management team. The company's leadership team met weekly, and the *On Board* Program was regularly discussed as a recurring main agenda item. This allowed an avenue to inform leadership of action plans and to obtain necessary resources. Additionally, Mutual de Seguridad, although they were the insurer, were very motivated to participate in the study to identify recommendations that could be translated to the many organizations they support. The buy-in for the study started with Mutual, resulting in the health and safety leadership team from the company attending trainings delivered by Harvard and sponsored by Mutual.

(3) What intervention mechanisms were necessary for successful implementation?

The process evaluation, documented through the interviews and meeting notes, that we were able to successfully build the organization's capacity so that they were able to integrate a *Total Worker Health* intervention into their existing management systems to improve working conditions. Data indicated that study activities occurred as anticipated albeit much slower, with fewer in-person steering committee meetings, and with adaptation due to the challenging socio-political and COVID-19 events. Key activities such as regular (although less frequent) steering committee meetings, developing and implementing action plans and strategies, establishing a communication infrastructure between drivers and leadership, and obtaining technical assistance were considered fundamental mechanisms that contributed to the success of the *On Board* Program. We identified several insights from our process data that were attributed to program success, including the increased agility the organization had to be responsive and nimble to workers' safety and well-being needs (Table 7). Although the context for this study was unique, the intervention was perceived to set the organization up for success during COVID-19 and social and political unrest.

Perceived Sustainability of the On Board Program

Key informants, including senior leadership, and drivers agreed that the *On Board* Program had been successful and should continue.

The components of the program that were seen as integral to its success included the communication infrastructure developed with workers to get information from them and communicate, in real-time, about safety, health, and well-being issues; and the steering committee. The program champion stated the following:

> "…….the greatest learning for our company is having created a new way of working, because we learned that an important thing is to collect data from the primary source - the workers. We also created a multidisciplinary team within the organization to be able to implement the necessary improvements. Obviously, not everything can be improved, some things may be unattainable, but it is also the function of this team to be able to prioritize needs and focus on the most critical ones. But in summary, I believe that it is this approach. For our organization, it is here to stay, this committee that we created in the [Center] framework will continue to function, undoubtedly, it is a super powerful committee and for nothing in the world did we think it would be this powerful. The project ended, but the process and the committee, on the contrary, it continues."

DISCUSSION

The *On Board* Study was designed as a feasibility pilot to design and test the implementation of a participatory organizational capacity building intervention designed to improve workers' safety, health, and well-being in the transportation industry in Chile. The purpose of this paper was to provide an in-depth exploration of the process of building capacity to implement a participatory organizational health and safety intervention in a high-risk industry in a context outside of the U.S. This study is important because there are few examples in the peer-reviewed literature focused on the implementation of these types of intervention and fewer still in countries outside of the U.S., Europe, and Australia.[14,53] A secondary objective for this paper was to also describe the substantive impact of the social and political unrest in Chile and the COVID-19 pandemic on the intervention and study findings and to highlight the unexpected ways in which this program enabled the company to adapt to changing working conditions and provide ongoing communication between organizational levels.

This study demonstrated the feasibility of implementing a TWH approach based on the Center Guidelines and the unexpected consequence of enabling the organization to be agile and responsive to worker safety and well-being needs during the social and political unrest and COVID-19 pandemic. Specifically, we were able to successfully implement the intervention, initially focused on improving two challenging working conditions and then pivot the focus of the intervention using the same principles during two significant events that impacted worker safety, health, and well-being.

The intervention initially resulted in changes to organizational policies, programs and practices surrounding schedules and routes, worker voice and communication systems to provide feedback, and interpersonal relationships between dispatchers/supervisors and drivers. Using targeted strategies to improve the working conditions resulted in a reduction in the number of back-to-back longer routes assigned to any one driver, improved worker voice, and increased trust between workers and supervisors allowing for increased application of driver-initiated safety protocols. The intervention was also well accepted by key company stakeholders including drivers, supervisors, union representatives, and company leaders with overall satisfaction with the changes made as a result of the intervention. Importantly, we were able to build capacity in the organization to maintain the *On Board* Program after the research team ceased providing technical assistance.

This study adds to a growing body of literature that demonstrates that integrated TWH approaches improve the safety, health, and well-being of workers by focusing on root causes to improve working conditions. Drivers generally reported that they were aware

TABLE 7. Intervention Mechanisms and Perceived Benefit Reported in Key Stakeholder Interviews

Phase	Intervention Mechanism	Perceived Benefit
Engaging leadership and collaborators	• Program Champions had attended a 2-day TWH workshop • Formal launch that introduced drivers and other key stakeholders to the *On Board* Program • Time needed to establish relationship, *On Board* Program goals, and roles and responsibilities • Translation of resources and delivery of all activities in Spanish; research team included native Spanish speakers and translators were used in all meetings • Included the organization in identifying sources of data, new data collection, and how to interpret the findings	• Facilitated their motivation and readiness to participate • Buy-in and demonstrated that the company was taking the program seriously • Allowed the organizational stakeholders to ask questions and feel confident about the *On Board* Program • Allowed everyone to speak freely in their native language. • Enabled replication of the process in future continual improvement cycles
Planning Implementation	• Steering committee had representatives from all levels of the organization including drivers. The committee had 10 members with a mechanism to include relevant stakeholders as needed (eg, including scheduling supervisor for shift and route issues) • Workshops with drivers and supervisors to discuss prioritized working conditions • Engaging the client early in the process when Center researchers were doing their site visit to showcase the *On Board* Program and discuss the issue of routes • The *On Board* Program was a regular agenda item for Leadership meetings • Access to the Center team for technical advice in the early stages. • Multiple mechanisms for facilitating worker communication (campaigns, union representatives, communication boards, and communication log book)	• Manageable size that allowed all voices to be heard but gave scope to include others when needed to solve an issue • Obtain drivers' and supervisors' perspectives in a psychologically safe environment; engaged them in root cause identification and problem solving • Enabled joint collaboration in problem solving. Allowed the client to ask Center questions about the *On Board* Program. • Enabled leadership to be responsive and resources to be allocated. • Provided an avenue to resolve issues and brainstorm potential solutions to barriers. Facilitated the organization working through challenges and talking through options. • Workers like to provide feedback in different ways; this allowed more workers' voices to be heard.
Evaluation and continual improvement	• Discussion of sustainability early in the *On Board* Program and as a regular agenda item for technical assistance meetings • Discussion of worker surveys and providing resources for the organization to complete these themselves or using a third-party vendor.	• Enabled processes to be put in place and knowledge to be transferred to the organization long before the intervention period ceased

of the *On Board* Program at their company and its components. Drivers were also generally satisfied with the changes made as a result of the program. In particular, drivers were most satisfied with the changes that resulted in shortening of the bus routes. In general, although drivers reported a significant reduction in overall work hours, their perception of their own health and well-being did not improve over time. This is not surprising considering final data collection occurred during the pandemic, at a time when workers' well-being internationally was reported to be at an unprecedented low.[54,55] This has also been found by others including Brown and colleagues.[56] In addition, because of the exploratory nature of this feasibility study without a control group, it is almost impossible to say whether the changes observed in the survey findings are a result of the pandemic and unrest or the intervention.

There are few studies that have implemented a TWH-based program in Latin America. This is significant as it strengthens using TWH as an approach that can be applied in different contexts with different social-economic-political conditions to address worker safety, health, and well-being. Adapting interventions in different contexts can often be hampered with challenges: different hazards might need to be addressed and thus different strategies may be needed, the cost of implementing TWH approaches and strategies to mitigate hazards, ensuring linguistic translations are accurate and tailored to cultural needs, receptivity of the organization to the researchers and TWH concepts such as increasing worker voice, and establishing how to integrate TWH into a social-political-economic framework that impacts organizational policies and practices as well as the labor market.[57,58] One example of implementing a TWH approach in the literature from Latin America, using a case study design with a multinational agribusiness pre-COVID-19 pandemic, found that close collaboration with key stakeholders across different levels of the organization, consistent engagement to encourage buy-in, and linguistic and cultural adaptation of materials, increase the likelihood that a TWH approach could be adapted and implemented.[9] In our study, we identified several facilitating factors that enabled the successful implementation of an integrated TWH intervention, which we believe transcended and enabled adaptation through co-creation, to fit the organizational context. These factors include ensuring leadership and key stakeholder commitment to the program (in this case, this included union representatives and input from the client company), company motivation to improve worker safety, health, and well-being, establishing mechanisms to increase worker voice throughout the program, preintervention capacity building activities for key stakeholders delivered by a native Spanish speaker from Latin America, and provision of technical assistance as needed throughout the program to reinforce the initial capacity building.

The implementation of TWH interventions is a challenge for organizations, due to limited examples that describe the processes and strategies implemented. A recent study of developing a TWH intervention in the food service industry, another sector with high risk for injury and illness, is one pragmatic example of using the Center Guidelines to implement such an approach.[59] In this study, researchers and the company also faced challenges posed by external contextual factors. They described barriers to implementing an integrated approach due to conflicting priorities, navigating external challenges posed by a multiemployer workplace, financial pressures, and limited company resources devoted to the initiative.[6] We faced similar challenges in our study; however, because of the strong communication structures we implemented and engaging the client company in the intervention, we were able to successfully change the conditions of work, with perceived benefits to the drivers and both organizations–the host and client companies–involved. Having practical examples of how interventions are implemented in the published literature and what works (or does not work) and why enables others to learn from our experiences.

There are also several methodological challenges when implementing organizational interventions in research settings. Implementation is largely controlled by the organization, its motivations to participate, its resources, and its commitment to supporting the intervention over time. Changes that require altering management systems or implementing large-scale policies, programs, or practices can be logistically challenging and costly. Although the Center Guidelines offer a process for stepping through developing, implementing, and evaluating a TWH intervention embedded in organizations' management systems, interventions need to be tailored to meet these unique organizational needs. We found that readiness to implement a TWH approach was supported by providing training and education to develop not only the skills but also increasing key stakeholders' knowledge of TWH approaches and its foundational tenets. This helped enhance leadership commitment and support through the process but also to provide forethought to training and educational needs to build capacity in the organization, to enhance the existing health and safety culture, and to build the business case for implementing a TWH approach to their existing health and safety systems.

The findings of this study highlight how the use of the Center Guidelines to build organizational capacity to implement a TWH approach provided a worker well-being-focused management system that (a) improved workers' voice through the integration of simple yet effective communication structures that allowed input and feedback in real-time to enable rapid company response, (b) recognized the importance of securing leadership support by providing resources and creating mechanisms to ensure that the program was viewed as part of how they conducted their business, and (c) through capacity building, created a structure that was flexible and adaptable so as to be able to identify any worker health and safety issue and provide a framework for change. While these characteristics have been reported by others implementing TWH interventions, this study additionally provided evidence that TWH approaches are integral in improving worker safety, health, and well-being during critical events. This study provided examples of two major events within an 18-month period, coinciding with most of the rollout of the *On Board* Program. While many companies worldwide were struggling to deal with instituting national and local regulations as a result of the pandemic, Chile also was dealing with the aftermath of the 2019–2020 social and political unrest.

The future of work continues to evolve in response to shifting social, economic, political, environmental, and technological changes, and significant health and socio-economic and political events can have serious impacts on worker health and well-being. This study provided a unique example of how TWH approaches enabled a company to use the infrastructure established for this intervention to focus on driver health and well-being due to the COVID-19 pandemic and the social-political unrest in Chile in 2019–2020. Although this was not an *a priori* intervention target, because of the circumstances and because of the exploratory nature of this study, instead of halting study activities, the company pivoted and used our intervention to focus on drivers' safety and well-being needs during this challenging time. Communication systems implemented because of this intervention enabled the company to communicate key messages to their employees and also receive input from workers in real-time. This allowed rapid response to drivers' safety, health, and well-being concerns. This was also the first time that the company had engaged with their client company to establish a joint safety and well-being initiative. This participatory engagement allowed the company to co-develop strategies that could be more effectively implemented. Again, this set the tone for conversations during the pandemic in which both drivers and passengers needed to work together to implement recommendations to limit the spread of the virus.

Based on the barriers of implementing the intervention due to national and global events, we recommend that building capacity through training and resources as well as technical assistance needs to focus on the adaptability of the approach to the changing nature of work to build more resilience, responsiveness, and agility within

companies and within their workforces. The results suggest that the program helped address the conditions of work and improved communication among workers, supervisors, and company leadership. However, the chaotic nature of the rapidly changing world during the study also distracted from the implementation of the intervention. Workers and supervisors alike described the intervention positively. Although specific intervention activities (steering committee and focus on predetermined working conditions) were difficult to continue with the social unrest and COVID-19 pandemic due to the immense safety and health implications for workers (and especially when social distancing measures were implemented), the company saw this program as important for integrating and improving health, safety, and well-being of their drivers and planned to continue the *On Board* program. Importantly, a key tenant of the program—two-way communication with workers as a mechanism to improve their health, safety, and well-being—was an important learning for the company.

Study Limitations and Challenges

Our study was not designed to be an experimental study testing intervention efficacy, which would have required a comparison group to evaluate its effectiveness on health and well-being outcomes. Complex multifactorial organizational interventions can by challenging to implement with randomized designs; these have also been critiqued because of their inability to consider the role of context in intervention implementation and the difficulty controlling for differing external confounders across groups.[3] Because of the nature of the 2-year funding period provided by our Chilean funder, we opted to use a pre-experimental design using mixed-methods to focus on the feasibility of adapting and implementing an intervention in a context that, to our knowledge, had not yet trialed organizational interventions based on a TWH approach. Furthermore, organizational intervention research benefits from a thorough formative research phase to set the organization and the research up for success. Thus, our goal was to focus on evaluating the process and the contextual factors that influenced intervention design, implementation, and how it was perceived by key stakeholders. Future research should consider our learnings in designing a large-scale rigorous study.

The social and political unrest starting in October 2019 and the COVID-19 pandemic starting in March 2020 posed considerable challenges for the implementation and data collection for the program. First, the company needed to prioritize health and safety issues arising from these significant events. The company, because it is a transportation company, continued its work without interruption. Its work and priorities, however, were significantly affected by the new COVID-19 guidelines, inclement weather impacting their services, and additional safety incidents related to the social unrest. Despite this—and although meetings with the research team were often delayed and happened less frequently—when meetings did occur, we learned that the company was using the intervention processes and TWH principles to help them overcome some of their health, safety, and communication challenges, exacerbated by the fast-paced changes that needed to be made, especially as new COVID-19 guidelines were being enforced. Second, in-person research activities were not able to be conducted during the pandemic. Thus, we needed to adapt final data collection methods to allow remote and/or virtual data collection. In addition, because of having no control group, changes in worker health and well-being outcomes due to the intervention were likely masked by external health and well-being challenges due to the social unrest and COVID-19 pandemic. The extent to which these types of events exacerbated poor health and well-being was well documented internationally.[60] Final data collection—in December 2020, during the pandemic—occurred at a time of unprecedented uncertainty and instability. This likely influenced the way the drivers completed the surveys. Thus, we focused on survey questions that were directly related to the intervention and changes in working conditions in the reporting of our results.

CONCLUSIONS

This feasibility study demonstrated that we were able to successfully implement a TWH intervention, the *On Board* Program, in Chile. The social and political unrest as well as the COVID-19 pandemic occurred during the implementation period and the organization used the principles and skills learned to implement TWH approaches to assist them in navigating the uncertainty and heightened stressors experienced by workers. This allowed them to be agile and responsive to the changes in the external environment and any regulations that needed to be implemented, as well as organizational and driver safety, health, and well-being needs. Evaluation of the *On Board* Program indicated that through capacity building activities with key organizational personnel, the organization was able to integrate TWH-based processes using the Center's Implementation Guidelines, to address prioritized worker health and well-being issues, and to also use these new systems to address new health and well-being concerns that arose. The company created an organizational infrastructure that provided management new ways to view their policies and practices through a different health and well-being lens by not only addressing workers' concerns in real-time but also providing workers with a voice in the process to improve their working conditions.

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