Accepted: 4 May 2018
DOI: 10.1002/ajim.22864

RESEARCH ARTICLE

WILEY AMERICAN JOURNAL OF INDUSTRIAL MEDICINE

The relationship between organizational policies and practices and work limitations among hospital patient care workers

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Funding information
National Cancer Institute, Grant number: 3R25CA057711; National Institute for Occupational Safety and Health, Grant numbers: 2U19 OH008861-10, K01OH010673

Objective: We examined relationships between organizational policies and practices (OPPs) (safety practices, ergonomic practices, and people-oriented culture) and work limitations in a sample of hospital workers.

Methods: We used the 6-item Work Limitations Questionnaire (WLQ) to assess workers' perceptions of health-related work limitations. Self-reported OPPs and the WLQ were collected from workers in Boston, Massachusetts ($n = 1277$). We conducted random-intercept multi-level logistic regression models for each OPP using stepwise selection of covariates.

Results: As the unit-average ergonomic practice score increased by one, the odds of a worker reporting work limitations decreased by approximately 39% (P-value = 0.018), adjusted for job title, age, and body mass index. A similar relationship existed for people-oriented culture (P-value = 0.038). The association between safety practices and work limitations was similar, but not statistically significant.

Conclusions: This study demonstrated the importance of workplace OPPs. OPPs that promote positive and supportive environments and that foster improvements in ergonomics may help reduce work limitations.

KEYWORDS
ergonomics, healthcare, organizational policies and practices, work limitations

Institution at which the work was performed: Harvard T.H. Chan School of Public Health and Dana-Farber Cancer Institute

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1 | INTRODUCTION

An individual's chronic health problems may impact their ability to perform certain tasks while at work, thus leading to a health-related work limitation. To measure this, researchers often assess individual perceptions of how one's health interferes with the completion of daily work tasks. One validated instrument is the Work Limitations Questionnaire (WLQ). Developed by Lerner et al.[1] in 2001, the WLQ measures the degree to which someone experiences limitations at work due to health problems (both physical and emotional), and health-related productivity loss.[1–4] Previous research has demonstrated that the WLQ and other similar scales[4–6] are strongly associated with overall measures of health.[7,8] The WLQ is an important metric of worker health because it accounts for both chronic health conditions and the potential impact of these conditions on work activities.[4]

The ways in which chronic health problems impact one's experience at work has been explored among groups of workers with specific health conditions such as depression,[9] back pain,[10] and arthritis,[11] and in multiple industries including financial services,[12] laboratory sciences,[13] and health care.[14–16] In general, the findings of these studies suggest that as chronic health conditions worsen, an individual's work experience is adversely affected.

In this paper, we focus on the health care sector, which is one of the largest and fastest growing in the United States.[17] This sector is of particular importance because health care workers consistently have more nonfatal injuries and illnesses than workers in any other industry.[18,19] Like many other occupational groups, the average age of health care workers is rising, making them subject to age-related chronic health conditions, and co-morbidities,[20] in addition to acute injuries and illnesses. A large proportion of health care workers are employed in hospital settings (approximately 60% of registered nurses, and approximately 40% of nursing assistants[21,22]), thus, understanding associations between the hospital work environment and measures of working while sick or injured could help improve the health of this growing and high-risk workforce.

Although the number of injuries reported annually among workers in the health care industry has decreased in recent years, the overall level is still high compared to other industries.[19] To continue this downward trend, it is important to understand the scope and impact of chronic health conditions among this population. Many researchers and practitioners have begun to focus on the role of organizational policies and practices (OPPs) in shaping adverse health outcomes. OPPs such as safety diligence, ergonomic practices, safety leadership, and people-oriented culture are closely related to occupational injuries and disability management.[23–25] For example, our previous work has demonstrated strong associations between some of these OPPs and injury rates,[26] as well as with specific outcomes such as musculoskeletal pain and sleep deficiency in a population of health care workers.[27–29] Therefore, it is possible that OPPs may also impact chronic health conditions and in turn, health-related work limitations in the workplace. Few studies have examined the relationship between work organization factors and measures of work limitations, and those that have mostly focus on injured workers within the general population and have not accounted for industry-specific factors.[25,30]

In the current study presented here, we analyzed the associations between measures of OPPs and work limitations among health care workers in an acute care hospital setting. This analysis focused on ergonomic practices (worker perceptions of the design of the physical work environment and promotion of the use of tools), safety practices (worker's perception of safety leadership, safety training, and safety diligence), and people-oriented culture (worker's perception of how management promotes positive and supportive workplace environments).

We hypothesized that more positive work environments, as measured by OPPs, would be associated with fewer work limitations, as measured by the WLQ. The framework for this study (Figure 1) is adapted from the conceptual framework of the Harvard T.H. Chan School of Public Health's Center for Work, Health, and Well-being.[31] The theory behind this study is that organizational policies and practices affect the conditions of work (in this case, in the hospital),

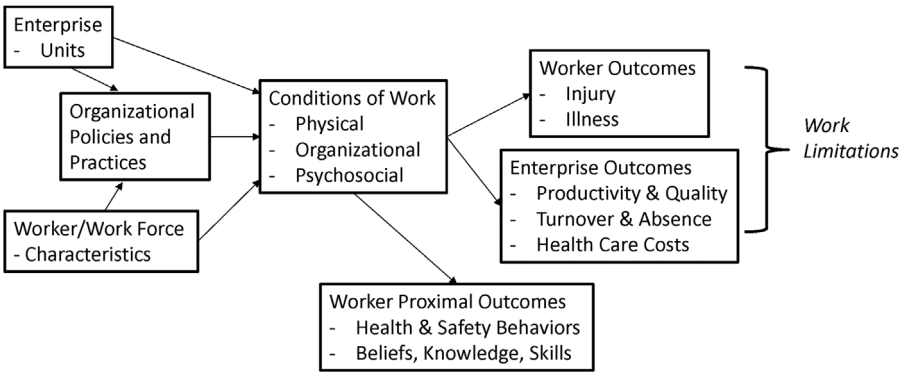

FIGURE 1 Conceptual framework for this study, based on Sorensen et al.[31] According to Figure 1, organizational policies and practices (OPPs) influence the conditions of work, which in turn influence worker proximal outcomes, worker outcomes, and enterprise outcomes. This paper analyzes the relationship between measures of OPPs, and work limitations. Work limitations are not directly included in the model, however, they reflect a combination of worker health outcomes (injury and illness) and enterprise outcomes (productivity)

which in turn impact worker and enterprise outcomes. The long-term goal of this investigation is to inform and guide priorities for future workplace interventions within the health care industry that aim to reduce the burden of workplace injuries and illnesses.

2 | METHODS

2.1 | Survey data

The data in this analysis were collected as part of a survey in a study by the Harvard T.H. Chan School of Public Health's Center for Work, Health, and Wellbeing in partnership with Partners HealthCare System. The goal of the overall study was to quantify the relationship between worksite programs, policies, and practices with worker health and economic outcomes at the unit and individual levels. This study was approved by the Office of Human Research Administration (OHRS) at the Harvard T.H. Chan School of Public Health Institutional Review Board for protection of human subjects.

Between March and June of 2014, we surveyed 1968 patient care workers at two large teaching hospitals in Boston, Massachusetts. Workers were eligible for participation if they worked under the direction of a nurse manager in one of 63 patient care units, had direct patient care responsibilities, and worked at least 20 h per week, or were designated as minimum half-time equivalent in Patient Care Services. Eligible job titles included registered nurses, licensed practical nurses, and patient care assistant/nursing assistants. Workers from environmental services and allied medical staff (e.g., physical therapy and occupational medicine) were excluded from the survey, as these workers were not assigned to specific patient units. For 55 of the 63 eligible units, we invited a random sample (33%) of workers to participate in the study. For the remaining eight units, we oversampled and invited 100% of workers for purposes of a proof-of-concept trial unrelated to the present analysis.

2.2 | Measures

2.2.1 | Organizational policies and practices

We examined ergonomic practices, safety practices, and people-oriented culture based on a modified version of the Organizational Policies and Practices (OPPs) questionnaire.[23,27] The ergonomic practices scale contains six items that relate to the extent to which activities at work are designed to reduce the biomechanical workload. For example, a respondent would indicate his or her level of agreement to the following statement: "Work is designed to reduce patient lifting." The safety practices scale contains five items on safety leadership and diligence. An example question from the safety practice scale asks the respondent to assess their level of agreement with the following statement: "Supervisors on this unit confront and correct unsafe behaviors and hazards when they occur." The people-oriented culture scale captures the extent to which a positive and supportive workplace environment exists that fosters employee involvement in decision-making and trust and cooperation with management. An example question from this scale asks a respondent to indicate their level of agreement with the following statement: "There is a high level of trust in the employee/employer relationship on my home unit." (See Table S1 in the supplementary files for full list of questions).

All three of the scales were scored on a five-point Likert-type scale, ranging from strongly agree to strongly disagree, with higher numerical values representing positive organizational practices and policies. Items within each scale were averaged together to generate an average individual score. Prior studies have demonstrated the strong reliability and validity of these measures.[23]

The unit OPP constructs represent shared perceptions of the work environment and reflect how policies and practices were carried out on the ground. While different individuals within a unit may have different views, by averaging the unit values we are able to examine a collective view of the OPP. Therefore, we used unit-level measures of OPPs in all analyses. Each study subject was assigned to a single unit where they were routinely employed. We averaged all OPP scores together for a given unit to use in the analyses. All 63 units from which data were collected were included in the analysis.

2.2.2 | Work limitations questionnaire

The survey included the eight-item, short form version of the Work Limitations Questionnaire (WLQ).[1,32] There were two questions each from the following domains: time management demands, physical demands, output demands, and mental-interpersonal demands. The questions asked respondents to indicate how frequently they experience limitations on the job due to health problems and health-related productivity loss in the past 2 weeks. For example, a question from the time management demands section asked the respondent (emphasis included in survey instrument): "In the past 2 weeks, how much of the time did your physical health or emotional problems make it *difficult* for you to start your job as soon as you arrived at work?" An example from the physical demands section asked the respondent: "In the past 2 weeks, how much of the time were you *able* to sit, stand, or stay in one position for longer than 15 min while working, without difficulty caused by physical health or emotional problems?" An example question from the output demands section asked the respondent: "In the past 2 weeks, how much of the time did your physical health or emotional problems make it *difficult* for you to finish the work on time." And finally, an example from the mental-interpersonal demands asked the respondent: "In the past 2 weeks, how much of the time did your physical health or emotional problems make it *difficult* for you to speak with people in-person, in meetings, or on the phone?" For all domains, response options included: all of the time, most of the time, some of the time, a slight bit of the time, none of the time, or does not apply to my job. The responses for the physical domain section were reverse coded, as the question asks the respondent if they are able to do something rather than if something is difficult, as is the case in the other domains. The score was generated by averaging the items together, with a lower score representing fewer work limitations and therefore better health conditions. (See Table S2 in the supplementary files for full list of questions).

We performed an exploratory factor analysis using principal factor analysis to assess the internal validity of the scale. The results of the factor analysis indicated that six out of the eight questions loaded onto one factor, and the remaining two items loaded onto a second factor. The questions that loaded onto the second factor represented the physical demands domain; whereas the other three domains loaded onto the first factor. The Cronbach's alphas for the eight-item and six-item questionnaires were 0.80 and 0.85, respectively (measured on a scale of negative infinity to 1, with a higher value indicating stronger internal consistency).[33] The subsequent analysis uses the six-item WLQ-score as the dependent variable based on the intent of the study research question (which focuses on the impact of organizational policies and programs), along with the results of the factor analysis and Cronbach alpha testing. The six-item measure assesses time management demands, output demands, and mental-interpersonal demands, all of which are domains that are likely to be associated with OPPs.

2.2.3 | Individual, demographic, and work organization covariates

Individual covariates assessed in the analysis included age, gender, race/ethnicity, education, and body mass index (BMI, generated from height and weight, in kg/m^2). Work characteristics included job title, tenure, hours worked, and unit type. The units were grouped into the following categories: Emergency Department, Operating Room and Orthopedics, Adult and Pediatric Medical/Surgical, Intensive Care Unit, Step-down, Psychiatry, and Obstetrics/Postpartum. Workers in the float pool were excluded from the unit-level analyses, as they did not have a primary association with a unit.

2.3 | Analyses

Our investigation focused on the relationship between unit-average OPPs and work limitations among workers. We kept the work limitations measures at the individual level because they reflect the individual experience rather than the group-level. We incorporated sampling weights into the analyses to control for the different sampling fractions described above.

The work limitations measure was highly skewed, with approximately half of the study sample indicating that they had no work limitations. Therefore, we dichotomized our work limitations measure to represent those workers with no work limitations or those who indicated having one or more. This is likely a reflection of an overall healthy population, a phenomenon common in occupational settings, and known as the healthy worker effect.[34]

We computed mixed effects logistic regression analyses of the WLQ score on each of the three OPP measures separately. Unit was added as a random effect to the model to account for the unit-to-unit variability in OPP scores.

We then added covariates mentioned above to the models via stepwise variable selection technique. Job title was forced to remain in the model to account for differences between registered nurses and patient care associates. Education was omitted from the list of potential covariates given the high correlation with job title. We also explored interactions of the covariates with the main effect. All analyses were completed using SAS, version 9.3 (SAS Institute, Cary, NC).

3 | RESULTS

3.1 | Study population and response rates

Of the 1968 eligible individuals, 1409 completed at least 50% of the survey (response rate 71.6%). For this analysis, we excluded those who did not complete the targeted constructs (OPPs and WLQ questions), and as mentioned earlier, we excluded those nurses who identified as a float pool nurse because they would not be linked with a specific unit. The resulting analysis sample size was 1277 (Table 1). Of the workers who completed the survey, 90% were nurses, and 10% were patient care associates. The sample was predominately white (81%) and female (94%), with a mean age of 41 years and a mean BMI of 25.8. The workers were associated with one of 63 units across the two hospitals.

3.2 | Associations between OPPs and work limitations

The results of the regression models indicate that as the average unit ergonomic practices scale increased by one point, the odds of a worker having a work limitation decreased by approximately 34%, which was statistically significant (OR = 0.66; *P*-value = 0.047) (Table 2). When adjusting further for job title, age, and BMI, the association became even stronger (OR = 0.61; *P*-value = 0.018). A similar pattern existed for people-oriented culture (adjusted model: OR = 0.62; *P*-value = 0.038). In other words, units with better ergonomic practices and units with better people-oriented culture were associated with workers with fewer work limitations. The direction of the associations between WLQ and unit safety practices was similar, although it was not statistically significant (OR = 0.68; *P* = 0.092).

4 | DISCUSSION

The goal of this study was to examine the relationship between organizational policies and practices and work limitations among patient care workers at two hospitals in Boston, Massachusetts. We found the odds of a worker having a work limitation decreases as either ergonomic practices or people-oriented culture improved. While a similar association was seen within the safety practices OPP, this relationship was not statistically significant. However, the direction of association was the same. All results were in line with our main hypothesis that positive measures of OPPs are associated with reduced odds of working with limitations, as measured by the WLQ.

The metrics that quantify work limitations, including the WLQ, reflect individuals' perceptions of how their health interferes with the completion of their daily tasks, rather than a direct measure of productivity. Although there have been some attempts to quantify the relationship between the WLQ and independent measures of

TABLE 1 Individual and unit characteristics of the patient care workers (n = 1277)

Individual worker characteristics	No. (%) or mean (SD)
Occupation	
Staff nurse	1155 (90.4%)
Patient care associate	122 (9.6%)
Hours worked	
Less than 30 h	277 (21.7%)
30–34 h	130 (10.2%)
35–39 h	567 (44.4%)
40–44 h	288 (22.5%)
over 44 h	15 (1.2%)
Race/ethnicity	
Hispanic	48 (3.8%)
White	1031 (80.7%)
Black	97 (7.6%)
Mixed race/other	101 (7.9%)
Gender	
Male	83 (6.5%)
Female	1194 (93.5%)
Education	
Grade 12/GED or less	26 (2.0%)
1–3 years of college or tech school	200 (15.8%)
4-year college degree (graduate)	848 (67.0%)
Any graduate school	192 (15.2%)
Tenure	
0–<5 years	240 (18.8%)
5–< 10 years	366 (28.7%)
10+ years	671 (52.5%)
Age	41.1 (±11.8)
BMI	25.9 (±5.0)
Unit category	
ER	66 (5.2%)
OR/orthopedics	112 (8.8%)
Med/surg (adult or pediatric)	543 (42.5%)
ICU (adult or pediatric/neonatal)	323 (25.3%)
Stepdown	59 (4.6%)
Psychiatry	17 (1.3%)
OB-postpartum	157 (12.3%)
Organizational policies and practices unit averages	
Safety practices scale (1–5)	3.8 (±0.74)
Ergonomics practices scale (1–5)	3.2 (±0.84)
People-oriented culture scale (1–5)	3.7 (±0.73)

productivity[35] many questions remain about the strength and consistency of this relationship. Still, the WLQ is one of the better-validated measures.[3,7] Our focus on individual perceptions of health-related work limitations does not directly address productivity.

This study demonstrates the importance of organizational policies and practices in association with work limitations in acute care settings. Most of the other studies examining the impact of OPPs on worker health and safety have used outcome metrics focused only on specific health and safety outcomes such as injury rates,[26] reporting of musculoskeletal disorders,[27,28] sleep deficiency,[29] and disability management,[25] but not measures that relate to work limitations. The individual questions in the WLQ ask individuals to reflect on how their physical health or emotional problems interfered with their activities at work. For example, questions within the time domain ask a respondent to reflect on how often their physical health or emotional problems made it difficult to start work as soon as the individual arrived at work. This provided us with an outcome measure that reflected how chronic health can affect one's experience at work. Thus, by selecting an outcome metric that reflects an individual's perception of their own health-related limitations, we illustrate the importance of OPPs at the workplace. Our findings indicate that positive measures of ergonomic practices and people-oriented culture are associated with workers' reporting fewer work limitations, which could have implications on many aspects of work such as health-related productivity loss.

The independent variables used in this study focused on measures of OPPs at the unit level, not the individual level. These unit-level OPPs meant that our measures of safety practices, ergonomic practices, and people-oriented culture represented the shared perceptions of a given hospital unit, rather an individual worker. Our dependent variable, work limitations, was measured at the individual level. This multi-level approach can help us understand the impact of organizational (or in this case, unit) level impact on individual outcomes. The results of our analysis have implications for intervention design, in that they highlight factors in the organizational environment that are associated with individual-level outcomes.

Based on the research question driving this paper, along with the results of the factor analysis and Cronbach alpha's, our study used a 6-item version of the WLQ, leaving out the physical demands section. This decision was also supported by concerns expressed in other studies that included the physical demands questions, where authors highlighted potential concerns with the physical demand domain due to weak correlations with other work demand domains.[36–38] Our data indicated that six out of the eight items grouped together as a single factor (time management, output, and mental-interpersonal demands), whereas the remaining two items (those from the physical demands domain) represented a separate factor. Furthermore, in our study, approximately half of our sample had no work limitations in the time-management, mental, or output demands domains, but approximately three-quarters of our sample reported some sort of work limitation in the physical domain.

4.1 | Limitations and strengths

The data analyzed in this study were generated from cross-sectional data; therefore, as with any cross-sectional data, we are unable to infer causality, given the lack of information on the temporal sequence. Furthermore, this study used self-reported data and is

TABLE 2 Generalized linear mixed model predicting individual binary work limitations from organizational policies and practices (OPPs) unit averages

	Model 1[a]			Model 2[b]		
	N Obs	Odds ratio (95%CI)	*P*-value	N Obs	Odds ratio (95%CI)	*P*-value
Separate models						
Ergonomic practices	1277			1196		
No work limitations		1.00			1.00	
One or more work limitations		0.66 (0.44, 0.995)	0.047		0.61 (0.41, 0.92)	0.018
Safety practices	1277			1196		
No work limitations		1.00			1.00	
One or more work limitations		0.72 (0.46, 1.14)	0.16		0.68 (0.43, 1.07)	0.092
People-orientated culture	1277			1196		
No work limitations		1.00			1.00	
One or more work limitations		0.67 (0.42, 1.06)	0.09		0.62 (0.39, 0.97)	0.038

[a]Model 1 contained unit as a random effect and was not adjusted for any other co-variates.
[b]Model 2 contained unit as a random effect and was adjusted for title, age, and BMI.

thus subject to recall and social-desirability bias. The data described here also reflect the worker experience at two large teaching hospitals in Boston, Massachusetts, which may not be generalizable to other patient care settings or other workplaces. Finally, although we attempted to account for unit-to-unit variability in our statistical modeling, we acknowledge that there can be large differences between units on metrics other than those captured by the OPP measures and therefore we may not have controlled for all potential confounders.

Despite these limitations, our study had many notable strengths. We had a large number of participants, a high response rate, and we used measures that had been previously validated in other populations. Additionally, a major strength of this study is the use of the work limitations metric as the outcome. Many previous studies have examined the impact of OPPs on health outcomes, but without also considering the impact of these OPPs on health-related productivity loss. Thus, these previous studies may have underestimated the impact of OPPs in the workplace, given that an individual's work limitations affects workers, employers, and patients.

5 | CONCLUSION

This study demonstrates the importance of unit-level organizational policies and practices at the workplace. Specifically, interventions that address practices related to ergonomics and people-oriented culture are likely to hold promise in terms of their potential to reduce work limitations; exploring these relationships in the context of interventions warrants further attention in future research. Given the high rate of injuries and illnesses among health care workers, an increased focus on improving OPPs is greatly needed. Policies and practices that promote a positive and supportive workplace environment and foster ergonomics may indeed help improve the chronic health, leading to reduced work limitations. A future related step in understanding this link would be to examine a longitudinal database where causality can be examined.

AUTHORS' CONTRIBUTIONS

EHS conceptualized the study, led all data analysis planning, data interpretation, and manuscript drafting, and is responsible for all aspects of the work. The data from this study was collected as part of a larger study of which GS was the principal investigator from 2001 to 2016, and ELS is currently principal investigator. AS provided expert statistical guidance. All authors contributed to interpretation of data and editing of manuscript. All authors approved of the final version of the manuscript.

ACKNOWLEDGMENTS

This study would not have been accomplished without the participation of Partners HealthCare System and the leadership of Joseph Cabral and Kurt Westerman. The authors thank Partners HealthCare Occupational Health Services; Lisa DiMarino and Rachel Corbin-Gupp at Partners HealthCare Human Resources; individuals at each of the hospitals, including Jeanette Ives-Erickson, Jackie Somerville, Dawn Tenney and Deborah Mulloy in Patient Care Services leadership; and Jeff Davis and Julie Celano in Human Resources. They also thank Mario Dashi, Terry Orechia, Eddie Tan, Brian Chan, and Shari Weingarten for assistance with supporting databases, and Christopher Kenwood from the New England Research Institute and Na Wang from Boston University for data preparation.

FUNDING

Grant Sponsor: US Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH); Grant

numbers: 2U19 OH008861-10 and K01OH010673. Grant Sponsor: National Institutes of Health (NIH), National Cancer Institute (NCI); Grant number: 3R25CA057711.

ETHICS APPROVAL AND INFORMED CONSENT

This study was approved by the Office of Human Research Administration (OHRS) at the Harvard T.H. Chan School of Public Health Institutional Review Board for protection of human subjects. All participants provided written informed consent.

DISCLOSURE (AUTHORS)

The authors declare no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

Steven B. Markowitz declares that he has no competing or conflicts of interest in the review and publication decision regarding this article.

DISCLAIMER

None.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

How to cite this article: Sparer EH, Boden LI, Sorensen G, et al. The relationship between organizational policies and practices and work limitations among hospital patient care workers. *Am J Ind Med*. 2018;61:691–698. https://doi.org/10.1002/ajim.22864