Impact of Organizational Policies and Practices on Workplace Injuries in a Hospital Setting

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Objective: This study aimed to assess relationships between perceptions of organizational practices and policies (OPP), social support, and injury rates among workers in hospital units. **Methods:** A total of 1230 hospital workers provided survey data on OPP, job flexibility, and social support. Demographic data and unit injury rates were collected from the hospitals' administrative databases. **Results:** Injury rates were lower in units where workers reported higher OPP scores and high social support. These relationships were mainly observed among registered nurses. Registered nurses perceived coworker support and OPP as less satisfactory than patient care associates (PCAs). Nevertheless, because of the low number of PCAs at each unit, results for the PCAs are preliminary and should be further researched in future studies with larger sample sizes. **Conclusions:** Employers aiming to reduce injuries in hospitals could focus on good OPP and supportive work environment.

Learning Objectives

- Discuss the issue of occupational injuries in health care, with special reference to the rates among registered nurses (RNs) and nursing aides, or patient care associates (PCAs).
- Summarize the new findings on associations between perceived organizational practice and policies, social support, and injury rates among RNs and PCAs on hospital units.
- Discuss the study implications for efforts to reduce hospital injury rates, including key questions for future research.

A substantial fraction of the workforce is employed in health care,[1] a sector having among the highest rates in occupational injury.[1] Within health care, injury rates are higher among nursing aides than among nurses.[2,3] Registered nurses (RNs) and patient care associates (PCAs) suffer a disproportionately high percentage of musculoskeletal injuries with more than half the injuries reported as sprains and strains.[1,4] These injuries are associated with significant lost work days per year among RNs and PCAs, with 6 and 5 median lost days from work, respectively.[1] Our previous work has demonstrated that injury rates among nursing aides (PCAs) are 60% higher than those among nurses (RNs) in the population where this study was conducted.[2]

The health care workforce is diverse regarding education and race but includes a substantial majority of women at all levels.[2,3] In general, a greater percentage of nonwhite and immigrant health care workers perform as nursing aides, positions that require less education and yield lower incomes.[2,5] This lower training profile and need to work longer hours to offset low wages may contribute to some of the higher injury rates among aides.[1] Also, risk of exposure to injury hazards may differ between occupations. In two recent studies, exposures to psychosocial and physical hazards were greater for hospital aides than for hospital nurses.[6,7] In these studies, physical workload and psychosocial working conditions explained more OSHA-reported injuries,[6] self-reported injuries, and physician-diagnosed injuries[7] than were explained by socioeconomic status.

The Job Demand/Control model denotes social support (coworker support and supervisor support) as important modifiers of job stress.[8–10] Among direct patient care workers, organizational and managerial supports have been shown to have significant effects on work satisfaction.[11] Among nurses, perceived supervisor support seems to have a direct relationship with occupational stress and worker reports of injury and pain.[11,12] Such results imply that interventions targeting organizational support (nurse supervisors/managers) may have positive effects in reducing a variety of worker adverse health-related outcomes.

In addition to these classic psychosocial factors, researchers have proposed and investigated the role of a more comprehensive and specific set of organizational policies and practices in preventing injuries and disability.[13–15] This research builds on the model developed by Habeck et al[16], suggesting that external factors, such as economy, legislation, and market forces, as well as factors inside the organization, such as people-oriented culture, commitment to safety and ergonomics, and disability management, influence occupational injury and disability. Research based on this model has elicited eight dimensions associated with occupational injury and disability outcomes: people-oriented culture, active safety leadership, safety diligence, safety training, proactive return to work, disability case management, ergonomics, and wellness.[15] In previous research, we have seen that these factors have associations with health and well-being, self-reported pain, and limitations at an individual level[12,17,18]; however, the relationship between these self-reported levels aggregated at an organization's unit level and the unit's injury rate recorded via administrative health and safety processes and databases have not been explored. Understanding the potential health implications of the work environment at the unit level may inform policy-level interventions with implications for worker health.

The framework for this study is shown in Fig. 1. It is adapted from the model for the "Be Well Work Well" project at the Harvard School of Public Health Center for Work, Health, and Well-being[18]

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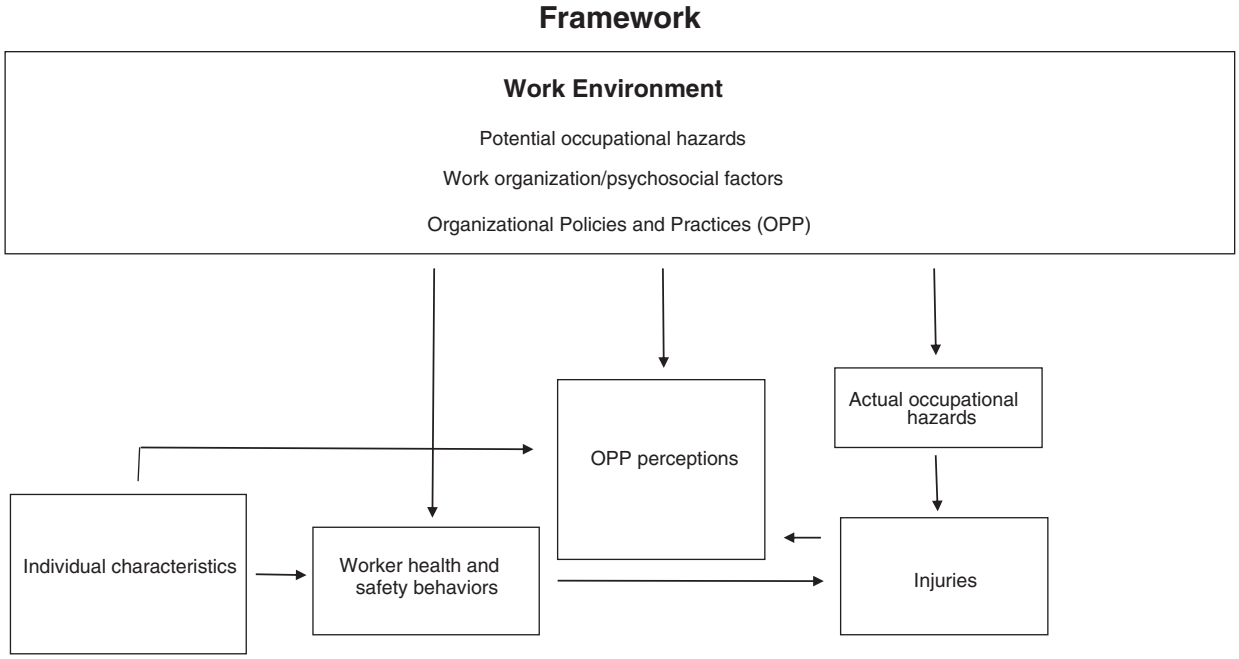

FIGURE 1. Conceptual framework for the study.

and the model by Habeck et al.[16] We see organizational policies and practices, among other factors, as affecting workplace hazards, which, in turn, affect the injury rate.

Leaders are important for the psychosocial work environment on the hospital unit they lead.[19] The nurse managers influence organizational practices and policies and social support on the unit more than individual workers can,[15] so units within a hospital may differ on these outcomes depending on the workers' perceptions of how much importance the nurse manager places on organizational practices and policies and social support. This was the rationale behind our aim of assessing the relationship between unit injury rates and the unit's organizational practices and policies and social support as perceived by the workers.

In this study, we assessed perceptions of organizational practices and policies and social support in a population of hospital workers to develop knowledge about the relationship of these perceptions to injury rates among patient-care workers at the organization's unit level. Our main hypothesis is that hospital units where there is a high level of social support and where the workers perceive organizational policies and practices more favorably will have lower injury rates than units where these factors are considered less of a priority.

METHODS

The data were collected as part of the "Be Well, Work Well" project at the Harvard School of Public Health Center for Work, Health, and Well-being to inform the development of an integrated health protection/health promotion intervention. A survey was conducted in two academic hospitals in New England in the United States between October 2009 and February 2010 among workers who had direct patient care responsibilities and were employed at the hospitals 20 hours per week or more during 2008. The study was approved by the relevant institutional review boards for protection of human subjects. All procedures followed were in accordance with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all workers for being included in the study.

The participants were invited to the study by e-mail in October 2009 and asked to complete the survey online. We sent 2 e-mail reminders during the 4 weeks following the first contact and then mailed a paper version of the questionnaire to those who had not finished the survey online. After 2 more weeks, we sent a third e-mail reminder and a second paper survey to all nonresponders.

The occupational injury data were OSHA recordable injuries obtained from the hospitals' administrative databases for the period from September 28, 2008, to September 26, 2009.[2]

Measures

Organizational Policies and Practices

Organizational policies and practices were measured by a modified version of the Organizational Policies and Practices questionnaire.[15] The modified scales were described in a previous publication.[17] The patient care worker survey included 21 items from the organizational practices and policies questionnaire. The reliability and validity of the organizational practices and policies questionnaire have previously been tested and found acceptable.[15] The organizational practices and policies were scored on five-point Likert scales ranging from *strongly agree* to *strongly disagree* yielding 5 subscales, safety diligence ($\alpha = 0.79$), ergonomic practices ($\alpha = 0.89$), disability case management (not used in this study), active safety leadership (one question), and people-oriented culture ($\alpha = 0.79$). The organizational practices and policies scales were scored so that higher scores indicate better organizational practices and policies.

Job Flexibility

Three items about job flexibility explored how the units accommodate workers when they want to change their shifts because of personal needs.[20] The items were scored on a five-point Likert scale from *always* to *never* with the added option of answering "does not apply." High scores on job flexibility indicate high flexibility.

Social Support

Coworker and supervisor social support were measured by five social support items (two and three, respectively) from the Job Content Questionnaire[8] scored on a five-point Likert scale from

never to *always*. High scores on coworker and supervisor support imply strong support.

Analyses

All analyses were done using the statistical software SAS, version 9.2 (SAS Institute, Inc., Cary, NC).[21] To be accepted as a completed questionnaire, at least 50% of the items needed to be filled in, and 1399 (89%) of the online questionnaires met this criterion.

All analyses were done separately for RNs and PCAs on the basis of the differences in injury rates between these groups.[2] When comparing RNs and PCAs, only data from the units where both RNs and PCAs worked were included in the analyses.

To evaluate whether organizational practices and policies were associated with injury rates of patient care workers at the unit level, considering variation among units resulting from how the policies and practices are carried out within a unit, analyses were done at the unit level, with independent variables calculated as the average score within a unit. Poisson regression analysis was used to evaluate the bivariate associations between the independent variables of interest and injury rates. Following bivariate analyses of unadjusted associations, multivariable Poisson regression models were used to test whether the associations would remain when controlling for demographic and other dependent variables. Variables with bivariate P values < 0.2 were included in the initial multivariable models. To estimate rates, the regressions had an offset term reflecting hours worked on the unit. To account for any overdispersion, the scale parameter in the models was replaced with an overdispersion correction based on the deviance.

RESULTS

Two thousand randomly selected patient care workers were invited to participate in the survey. A total of 1572 workers completed at least 50% of the survey, a response rate of 79%. For this study, we selected the RNs and PCAs from patient care units to ensure that we only considered responses from workers directly involved with patient care ($n = 1230$). Ninety percent of the respondents ($n = 1103$) were RNs and 10% (n = 127) were PCAs. Ninety-three percent of the sample were women ($n = 1143$). Mean age was 41 years. Eighty-eight percent of the responding RNs and 87% of the PCAs chose to use the online version.

There were 101 units represented in this sample; 100 of them had RNs, and 58 had PCAs. When comparing RNs and PCAs, only data from the units where both RNs and PCAs worked, 57 units, were included in the analyses.

Unit demographic characteristics, organizational practices and policies scorings, and social support scorings are found in Table 1.

When analyzing the perceptions of the organizational practices and policies and social support on the units for the RNs and PCAs, the unit average RN responses were significantly lower on safety diligence, ergonomic practices, job flexibility, and coworker support than the PCA responses (Table 2). The correlations between RN and PCA scores within or across (data not shown) units were small and not statistically significant.

Bivariate Analyses

Associations between injury rates and organizational practices and policies scales were strong for the RNs, but there was only one significant association for the PCAs (Table 3): no-days-away injury rates were lower on units where the PCAs reported better ergonomic practices. For RNs, coworker support was related to days-away injury rates, but this was not the case for the PCAs (Table 3).

Multivariable Analyses

Rate ratios became closer to 1.0 and statistical significance declined when demographic and organizational practices and policies variables were included in multivariable Poisson models. Better ergonomic practices remained significantly associated with lower injury rates for the RNs (Tables 4 and 5). Better people-oriented culture was associated with fewer days-away injuries; however, this finding

TABLE 1. Selected Unit Characteristics of RNs and PCAs (Units With RNs, $n = 100$; With PCAs, $n = 58$)

	Total ($N = 101$)		RNs ($N = 100$)		PCAs ($N = 58$)	
Characteristic	***N***	**Mean (SD)**	***N***	**Mean (SD)**	***N***	**Mean (SD)**
No. of workers per unit	101	12.2 (7.8)	100	11.0 (7.5)	58	2.2 (1.9)
Age, yrs	101	41.2 (6.0)	100	41.2 (7.0)	52	40.7 (9.6)
Tenure, yrs	101	10.8 (4.8)	100	11.4 (5.5)	58	7.0 (6.5)
Organizational practices and policies						
Safety leadership (1–5)	101	3.9 (0.3)	100	3.9 (0.3)	57	4.0 (0.7)
Safety diligence (1–5)	101	3.7 (0.3)	100	3.7 (0.3)	57	4.0 (0.5)
Ergonomic practices (1–5)	101	3.1 (0.4)	100	3.1 (0.4)	56	3.5 (0.7)
People oriented culture (1–5)	101	3.6 (0.4)	100	3.6 (0.4)	57	3.6 (0.6)
Job flexibility (1–5)	101	2.0 (0.5)	100	2.0 (0.5)	52	1.7 (0.8)
Supervisor support (1–5)	101	3.5 (0.4)	100	3.5 (0.5)	55	3.7 (1.0)
Coworker support (1–5)	101	4.0 (0.3)	100	4.1 (0.3)	57	3.8 (0.9)
	N	**Mean % (SD)**	***N***	**Mean % (SD)**	***N***	**Mean % (SD)**
Gender (women)	101	92.6 (10.1)	100	93.1 (11.0)	55	84.9 (31.1)
Education						
Bachelor degree	101	60.5 (17.8)	100	66.9 (18.0)	54	15.7 (29.5)
Graduate school	101	14.1 (12.6)	100	14.4 (13.1)	54	7.2 (21.5)
Race						
White	101	81.3 (17.2)	100	88.6 (13.2)	54	28.1 (38.7)
Black	101	8.6 (11.7)	100	4.3 (8.0)	54	41.0 (40.5)

PCA, patient care associate; RN, registered nurse.

TABLE 2. Mean Difference Comparisons and Correlations of Organizational Practices and Policies, Job Flexibility, and Support Between RNs and PCAs

Unit-Level Characteristics	No. of Units	RNs, Mean (SD)	PCAs, Mean (SD)	Mean Difference	*P**	Correlation Coefficient	*P*
Safety leadership (1–5)	56	3.97 (0.29)	4.04 (0.68)	− 0.07	0.459	− 0.04	0.80
Safety diligence (1–5)	56	3.79 (0.34)	4.00 (0.54)	− 0.22	0.013	0.01	0.93
Ergonomic practices (1–5)	55	3.15 (0.43)	3.45 (0.71)	− 0.30	0.005	0.20	0.14
People-oriented culture (1–5)	56	3.65 (0.36)	3.62 (0.62)	0.03	0.769	0.13	0.32
Job flexibility (1–5)	51	2.11 (0.46)	1.70 (0.76)	0.42	<0.001	0.14	0.34
Supervisor support (1–5)	54	3.57 (0.46)	3.68 (0.96)	− 0.10	0.466	0.06	0.68
Coworker support (1–5)	56	4.09 (0.33)	3.76 (0.87)	0.32	0.013	− 0.03	0.83

**P* value for mean differences found using paired *t* test.
PCA, patient care associate; RN, registered nurse.

TABLE 3. Bivariate Associations Between Injury Rates and Perceptions of Organizational and Interpersonal Factors: Rate Ratios (RR), 95% Confidence Intervals (CI) and *P* Values

	Days-Away Injuries			No-Days-Away Injuries		
	RR	95% CI	*P*	RR	95% CI	*P*
RNs						
Safety leadership	0.30	0.15–0.59	<0.001	0.44	0.21–0.91	0.03
Safety diligence	0.32	0.18–0.57	<0.001	0.34	0.19–0.61	<0.001
Ergonomic practices	0.41	0.26–0.64	<0.001	0.33	0.21–0.51	<0.001
People oriented culture	0.33	0.18–0.59	<0.001	0.45	0.24–0.83	0.01
Job flexibility	0.84	0.50–1.41	0.52	0.86	0.51–1.44	0.57
Supervisor support	0.62	0.37–1.03	0.07	0.96	0.57–1.63	0.89
Co-worker support	0.43	0.22–0.87	0.03	0.74	0.34–1.60	0.45
Age	1.03	0.99–1.06	0.13	1.03	1.00–1.07	0.06
Female (%)	0.99	0.97–1.01	0.49	1.00	0.98–1.02	0.77
White (%)	1.00	0.98–1.02	0.83	1.01	0.99–1.03	0.26
PCAs						
Safety leadership	1.10	0.62–1.94	0.75	0.66	0.40–1.10	0.12
Safety diligence	0.78	0.39–1.59	0.50	0.54	0.27–1.11	0.09
Ergonomic practices	0.64	0.41–1.00	0.05	0.57	0.38–0.86	0.01
People oriented culture	1.35	0.75–2.40	0.32	1.45	0.82–2.59	0.20
Job flexibility	0.82	0.48–1.41	0.47	0.80	0.48–1.34	0.40
Supervisor support	1.17	0.78–1.75	0.44	1.22	0.83–1.79	0.31
Co-worker support	0.97	0.62–1.49	0.88	1.13	0.73–1.73	0.59
Age	1.03	0.99–1.06	0.13	1.02	0.99–1.06	0.22
Female (%)	1.01	0.99–1.03	0.14	1.01	0.99–1.02	0.39
White (%)	1.00	0.99–1.01	0.93	0.99	0.98–1.00	0.08

CI, confidence interval; PCA, patient care associate; RN, registered nurse; RR, rate ratio.

did not quite reach statistical significance at the 5% significance level (Table 4). For the PCAs, there were no statistically significant associations between organizational practices and policies variables and injury rates (Tables 4 and 5).

DISCUSSION

Units where the RNs reported better safety leadership, greater safety diligence, better ergonomic practices, stronger people-oriented culture, and higher social support from coworkers had lower injury rates. These findings support our main hypothesis; the anticipated associations between better organizational practices and policies and social support at the unit level, and lower injury rates were confirmed. Nevertheless, with the exception of ergonomic practices, none of these associations were found for the PCAs. In the multivariable models, most of the associations disappeared; only the RNs' perceptions that their units had better ergonomics practices still predicted lower injury rates.

Perceiving safety as important and adhering to good safety practices were previously found to be prerequisites for lower injury rates[22]; and this study supports these results. The associations between organizational practices and policies and injury rates were mainly seen for the RNs. The results for the PCAs showed that better ergonomic practices were the only organizational practices and policies scale significantly associated with lower injury rates, although for days-away injuries, the association was only borderline significant. This was a surprising finding. A possible explanation is that organizational practices and policies mainly affect nurses' working conditions, not those of PCAs, or it may be that PCAs are less

TABLE 4. Multivariable Models of Days-Away Injuries: Rate Ratios (RR), 95% Confidence Intervals (CI), and *P* Values*

	RR	95% CI	*P*
RNs			
Age	0.99	0.95–1.03	0.61
Safety leadership	0.56	0.24–1.30	0.19
Ergonomic practices	0.57	0.34–0.96	0.04
People-oriented culture	0.51	0.26–1.01	0.06
PCAs			
Age	1.01	0.98–1.05	0.54
Female	1.01	0.99–1.03	0.35
Ergonomic practices	0.71	0.41–1.23	0.24

*Demographic and the independent variables of interest with bivariate *P* values < 0.2 were included in the model.
PCA, patient care associate; RN, registered nurse.

TABLE 5. Multivariable Models of No-Days-Away Injuries: Rate Ratios (RR), 95% Confidence Intervals (CI), and *P* Values*

	RR	95% CI	*P*
RNs			
Age	1.00	0.97–1.04	0.97
Safety leadership	1.09	0.46–2.62	0.84
People-oriented culture	0.77	0.38–1.59	0.48
Ergonomic practices	0.35	0.21–0.60	<0.001
PCAs			
Race (white)	0.99	0.98–1.00	0.09
Safety leadership	0.62	0.33–1.15	0.14
Ergonomic practices	0.72	0.42–1.21	0.21
People-oriented culture	2.10	0.93–4.72	0.07

*Demographic and the independent variables of interest with bivariate *P* values < 0.2 were included in the model.
PCA, patient care associate; RN, registered nurse.

affected by unit practices and policies and more influenced by the delegation practices of the nursing staff. Patient care associates are more likely to work on multiple units and increased number of shifts so that injury rates may be confounded by these factors.

Furthermore, there were considerably fewer units with PCAs, 58 versus 100 with RNs. If the units with PCAs differ from the units with RNs only, this could account for some of the discrepancies in the associations between organizational practices and policies and injury rates between the occupational groups. The lack of a relationship between injury rates and organizational practices and policies for the PCAs could also reflect a difference in exposure to injury hazards as earlier research has demonstrated.[6,7]

Job commitment was unrelated to education in a study on professional caregivers,[23] so lack of commitment is an unlikely explanatory factor. Although it is possible that PCAs may be less aware of the organizational practices and policies of their units than the RNs, to our knowledge there is no scientific support for this possibility.

The RNs and PCAs did not agree on their perceptions of the organizational practices and policies on the unit; the mean difference comparisons showed small but significant differences between the occupational groups. The RNs reported more job flexibility and coworker support than the PCAs but reported lower scores on safety diligence and ergonomic practices. All correlations of the perceptions of organizational practices and policies and social support between the two groups were small and insignificant, thus supporting the decision to do separate analyses for the groups. The difference in perceptions also raises the question of whether actual organizational practices and policies on the same unit differ as applied to different job categories in the same unit or whether organizational practices and policies are the same but perceptions differ.

The finding that the perceptions of the organizational practices and policies were different between the occupational groups is consistent with earlier findings in hospitals[24] and in other businesses.[25] In a study exploring common and different views on work organization, health and safety, and psychosocial work factors among nursing aides and managers in nursing homes, the results indicated that the differences in perceptions between different work groups could be seen as natural, given their different places in the organizational hierarchy and thus different exposures.[26] This seems to be in contrast to another study that found supervisor and employee perceptions of safety climate to correlate,[27] so there is no clear pattern of documentation on this issue.

Injury rates were abstracted from the hospitals' administrative databases for the year preceding the distribution of our questionnaire. Workers in units with low injury rates may have perceived their units as safe and with high ergonomic standards as a result of the low injury rates, and their reports of organizational practices and policies accordingly may be less accurate. How much the workers will be aware of injury rates on their unit compared with other units in the hospital is uncertain, because in many hospitals this knowledge is restricted to management-level employees.

Differences between the work groups in exposure to hazard of injuries may be a confounder in the association between injury rate and organizational practices and policies. Psychosocial work environment and physical workload explained more of OSHA recordable injuries in hospitals than socioeconomic status, which may be seen as a proxy for work group.[6,7] Possible systematic differences in hazard controls by work group may also confound these associations. Other possible confounders of the relationships may be systematic differences in reporting of injuries by work group or differences in job flexibility and opportunities to alter schedules to provide short recovery breaks.

People-oriented culture and social support from coworkers were associated with lower injury rates on the unit for the RNs. This is in accordance with much research on the Demand/Control/Social Support (DC) model[9] and the Effort/Reward Imbalance (ERI) model.[28] Both models relate organizational and psychosocial factors to work stress and health outcomes for the workers.

The multivariable models showed fewer and weaker relationships between organizational practices and policies, social support, and injury rates, so some of the relationships disappeared and became weaker when controlling for possible confounders. For the RNs, better ergonomic practices were related to lower injury rates as the only organizational practices and policies scale associated with both days-away and no-days-away injury rates. Nevertheless, it is worth noting that, although not statistically significant, the risk ratios for days-away injuries for safety leadership and people-oriented culture were well below 1.0.

Among PCAs, perception of a more people-oriented culture on the unit was associated with higher no days-away injury rates in the multivariable analyses. This was counter to our expectations. The finding had a *P* value of 0.07 and thus was not statistically significant; however, with a risk ratio of 2.1, it is still an interesting finding. One possible interpretation of this finding is that, on units with more people-oriented culture, workers feel more comfortable reporting injuries. Also, they may report minor injuries that might not have been reported in a less people-oriented culture. Another

interpretation may be that the PCAs working in a unit with less people-oriented culture may tend to take days away from work when they have an injury, thus tending to increase no days-away injuries in units with more people-oriented culture. Nevertheless, the present data cannot give us any support for either interpretation and we also need further studies to establish if this is a spurious or real association.

In this study, organizational practices and policies and injuries were reported at unit level only, and it might be interesting to expand the scope and assess these relationships on an individual level. Adding this perspective could yield different results and thus increase our understanding of work environment and health; however, that is outside the scope of this article. It could be an interesting focus for future studies.

There were few PCAs at each unit, so the unit means of the organizational practices and policies for PCAs may not be very precise. Although these findings should be interpreted with caution, we chose to include the mean differences in our study to inform future study designs that may focus on possible differences between PCAs and RNs with regard to organizational perceptions. This study was cross-sectional, so we cannot infer causality as we have no information on temporal relationships. Injury rates could influence perceptions of organizational practices and policies as well as the other way around. In this study, we observe perceptions of organizational practices and policies, which we use as an indicator of actual practices and policies. It is possible that these perceptions are also affected by recent injury experience. Data on organizational practices and policies, job flexibility, and supervisor and coworker social support were self-reported and thereby subject to biases such as recall bias and social desirability bias. Workers at two academic teaching hospitals in Massachusetts provided the data for this study; thus, our findings may not be generalizable to other work settings, even hospital settings. Although we acknowledge these limitations, we also think that this study has strength conferred by the high number of participants, a high response rate, and access to a complete administrative data base for consistency in injury enumeration.

The surveys were offered to the participating health care workers as a choice between electronic and paper versions. An overwhelming majority of both the RNs and PCAs chose the electronic version, thus indicating that using electronic questionnaires may now be a reliable way of collecting data from health care workers.

CONCLUSIONS

Perceptions of better organizational practices and policies, together with a working environment nurturing social support among the RNs, were related to lower injury rates. Aiming at a supportive work environment and good organizational practices and policies, especially regarding ergonomics, may reduce injuries and disability costs for RNs. The association between injury rates and organizational practices and policies is less clear for the PCAs; thus, future research should aim to further explore whether organizational practices and policies really are unimportant for injury rates in this work group. This study provides support for evaluating the roles of RNs and PCAs separately, even if they coexist within the same hospital units, to understand the impact of organizational policies and practices on workplace injuries more completely.

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