# Organizational Characteristics Influence Implementation of Worksite Health Protection and Promotion Programs

## *Evidence From Smaller Businesses*

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**Objective:** We explored associations between organizational factors (size, sector, leadership support, and organizational capacity) and implementation of occupational safety and health (OSH) and worksite health promotion (WHP) programs in smaller businesses. **Methods:** We conducted a web-based survey of human resource managers of 117 smaller businesses (<750 employees) and analyzed factors associated with implementation of OSH and WHP among these sites using multivariate analyses. **Results:** Imple-Implementation of OSH, but not WHP activities, was related to industry sector ($P = 0.003$). Leadership support was positively associated with OSH activities ($P < 0.001$), but negatively associated with WHP implementation. Organizational capacity (budgets, staffing, and committee involvement) was associated with implementation of both OSH and WHP. Size was related to neither. **Conclusions:** Leadership support and specifically allocated resources reflecting that support are important factors for implementing OSH and WHP in smaller organizations.

Worksites are important venues for protecting and promoting worker health, safety, and well-being,[1] and employers are increasingly interested in preventing or reducing conditions such as chronic diseases, musculoskeletal injuries, sleep disorders, and stress among their employees.[2] Employer support for engaging in these health protection and promotion activities may arise from a combination of legal, financial, and ethical considerations. Most private worksites have legal responsibilities to meet minimal occupational safety and health (OSH) standards to protect worker health and safety,[3] and such efforts have been found to reduce work-related hazardous exposures and illnesses.[4,5] Although not mandated by the government, an increasing number of employers are now offering worksite health promotion (WHP) programs to protect and promote worker health, reduce health-related costs,[6–9] and perhaps to improve worker health, well-being, and productivity.[7,10–12]

There is a growing literature demonstrating associations between structural and functional factors of organizations with their willingness or readiness to adopt and implement a variety of innovations, including some studies that have specifically examined implementation of OSH and WHP innovations.[13–18] Results from these studies suggest that organizational factors such as company size, industrial sector, existence of top leadership support for OSH or WHP programs, and organizational capacity, in terms of dedicated staff, budgets, and committees to implement OSH and WHP are of potential importance.[19–22]

Compared with larger businesses, smaller employers offer fewer WHP programs, policies, and services[19,20,22] and fewer OSH activities.[21,22] Differences in implementation of OSH and WHP exist nationally by industrial sector, with blue-collar sectors, such as manufacturing, reporting higher numbers of OSH and WHP activities than other sectors, such as retail.[19,21] Differences in implementation of OSH and WHP by sector have also been found in a sample of multiple-sized Massachusetts companies.[22]

Company leaders often hold the key to providing the direction and resources to support program implementation, and their support has been found to be a key facilitator for both OSH and WHP programs[23,24]; nevertheless, few investigations have examined the consequences of differences in leadership support in relationship to levels of implementation of WHP and OSH. Having organizational capacity has been positively associated with implementation of WHP.[19,20] Although literature in OSH has not specifically associated organizational capacity with implementation, recent calls have been made by researchers to investigate further the relationships between organizational capacity, resources, and implementation of OSH among smaller businesses.[21]

Most of the research examining relationships between organizational factors and implementation of OSH and WHP activities focuses on larger organizations. Because most employees work in smaller organizations that generally have fewer resources, it is important to understand these relationships in small- to medium-sized enterprises.[25] Definitions of smaller organizations may range widely in the United States For example, the US Small Business Administration defines small businesses as having fewer than 1000 employees depending on industry[26]; the US Census Bureau defines them as having fewer than 500 employees[27]; and the federal health insurance system defines a small business as having fewer than 50 employees.[28] Definitions of medium-sized businesses also vary in the United States, with national surveys using between 250 and 4999 employees.[19–21,29] In this study, and on the basis of the US Small Business Administration definition,[26] we choose to define small- to medium-sized enterprises as having fewer than 750 employees, and call small- to medium-sized enterprises ''smaller organizations.''

Most of the extant research on organizational factors and implementation focuses on either OSH or WHP; there is a dearth of information on implementation of both. Although a recent study in

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Massachusetts investigated relationships of size and sector with implementation of OSH and WHP,[22] the study did not report associations with top leadership support or organizational capacity, and the generalizability of these findings beyond the Massachusetts sample is unknown. It is also unclear whether having high numbers of OSH activities is related to having high numbers of WHP activities in smaller businesses, although Tremblay and colleagues found this relationship in a study of multiple-sized, including larger, organizations.[22]

To respond to the call from the National Institute for Occupational Safety and Health (NIOSH) to increase the integration of OSH and WHP through its Total Worker Health™ initiative,[30] a greater understanding of the relationships between organizational characteristics and implementation of OSH and WHP, particularly among smaller businesses, is needed. This article investigates relationships between organizational characteristics (ie, size, sector, leadership support, and capacity) and the extent of implementation of OSH and WHP activities in 117 smaller businesses in Upper Mid-Western states. We also examine whether high numbers of OSH activities are correlated with high numbers of WHP activities in smaller enterprises.

## METHODS

### Study Design, Sample, and Procedures

This cross-sectional observational study is part of a larger study aimed at understanding the needs, interests, and practices of smaller organizations in relation to adoption and implementation of OSH and WHP programs. We obtained two lists of human resource directors/managers from a state Chamber of Commerce and from an insurance brokerage firm based in Minnesota to identify potential participants. The lists contained contact information for all companies in the respective organization's databases that reported having fewer than 750 employees. Our research team distributed brief web-based surveys to human resource directors/managers of 400 of those enterprises. Respondents were offered a $25 gift card as an incentive to complete the survey. Up to three reminder E-mails were sent to nonrespondents. Beyond these three reminder e-mails, a maximum of three additional attempts were made to reach each nonrespondent by phone, after which a message was left to inform them that a copy of the survey would be sent via mail. For those nonrespondents for whom we did not have a phone number, a copy of the survey was sent by mail.

### Study Measures

Measures were adapted from previously validated or administered surveys of OSH and WHP.[20,31,32] The complete survey is available from the authors upon request.

### Implementation of OSH and WHP Activities

Table 1 presents the questions used to measure implementation of OSH and WHP programs and policy activities, our primary outcomes. The questions to assess the number of OSH activities were based on a survey previously used by the research team[31] that is based on the Occupational Safety and Health Administration's (OSHA) 1995 Occupational Safety and Health Program Evaluation Profile. The extent of implementation of OSH programs and policies refers to the number of ''yes'' responses to 10 questions. Response options were dichotomous ($y = 1$; $n = 0$), and could range from 0 to 10. Questions to assess the number of WHP activities were adapted

**TABLE 1.** Survey Questions on Occupational Safety and Health and Worksite Health Promotion Programs and Policies

| Occupational Safety and Health | Worksite Health Promotion |
|---|---|
| Do you have an occupational safety and health program or system? | Do you have a written policy for tobacco that completely prohibits smoking on your worksite's property? |
| Is your occupational safety and health or system updated on a regular basis? | Do you have a written policy for alcohol, specifically addressing employee use of alcohol at the worksite/on the job? |
| Do you have a written occupational safety and health policy statement? | Do you have a written policy for drugs, specifically addressing employee use of illegal drugs at the worksite/on the job? |
| Does management set safety goals for the worksite on a regular basis? | Do you have a written policy for employee counseling (eg, for alcohol/drug abuse or for other family issues)? |
| Are managers/supervisors directly accountable for occupational safety and health in their areas? | Do you have a written policy for occupant protection, specifically requiring use of seat belts during business travel in an automobile? |
| Is there a way for employees to report safety hazards, problems, or concerns? | Do you have a written policy for prohibiting firearms at the worksite? |
| Is there feedback to employees who report hazards, problems, or concerns? | Do you have a written policy for physical activity that allows employees to take fitness breaks on the job? |
| Are hourly employees provided with occupational safety and health training or education? | Do you have a written policy for nutrition that requires healthy food options available at all worksite meetings/functions? |
| Is there a process in place to orient new employees to occupational safety and health, and emergency response procedures? | During the last 12 mos, did you offer health screenings (eg, blood pressure, cholesterol, and diabetes)? |
| Are supervisors/managers provided with occupational safety and health training or education? | During the last 12 mos, did you offer health risk assessment—questionnaires about health habits? |
| | During the last 12 mos, did you offer physical activity and/or fitness programs? |
| | During the last 12 mos, did you offer on-site educational programs (eg, nutrition, tobacco, physical activity, and stress reduction)? |
| | During the last 12 mos, did you offer individual coaching/counseling (eg, weight management and smoking cessation)? |
| | During the last 12 mos, did you offer an employee assistance program? |
| | Does your worksite have a cafeteria? |
| | Does your worksite label healthy food choices in the cafeteria? |
| | Does your worksite have vending machines for food/beverages? |
| | Does your worksite offer special promotions/discounts to encourage healthy food choices in the cafeteria or from vending machines? |
| | Does your worksite have on-site shower facilities? |

from the National Worksite Health Promotion Survey[20] and the Massachusetts Worksite Health Improvement Survey.[32] The extent of implementation of WHP programs and policies refers to the number of ''yes'' responses to 19 questions. Response options were dichotomous ($y = 1$; $n = 0$), and could range from 0 to 19.

We considered four organizational characteristics: size, sector, leadership support, and capacity.

### Size and Industrial Sector

Size was defined as the number of employees in each company. Industrial sector was determined by using the North American Industrial Classification System.[33]

### Leadership Support

Leadership support measures for OSH and WHP were adapted from Cinite et al[34]; separate questions inquired whether there was a person in top leadership who was a strong supporter of (1) OSH and (2) WHP. Response options were dichotomous ($y = 1$; $n = 0$).

### Capacity

On the basis of Hannon and colleagues' measure for WHP capacity,[19] we included three items assessing whether the respondents' companies had dedicated budgets, staff, and worksite committees for WHP. Each of these three items' response options was either yes or no ($y = 1$; $n = 0$). We asked similar questions for OSH that had similar response options. We estimated each individual capacity item separately. After Hannon and colleagues,[19] we combined each of the three individual items to develop a WHP capacity score (possible range of 0 to 3). We used the same process to develop an OSH capacity score (possible range of 0 to 3). We estimated means of OSH and WHP implementation activities stratified by each individual capacity factor. If a factor is present, then mean implementation of both OSH and WHP is higher than if the factor is not present. But if present, the three factors are similar in terms of mean implementation for both OSH and WHP strategies.

Variables Used in analyses: Size, Sector, and Levels of Implementation of OSH and WHP activities

We initially explored the relationships of numbers of OSH and WHP activities to company size using the median, mean, and quartiles; we also used size as a continuous variable. None showed significantly different results. We subsequently divided the company size variable at the median into fewer than 112 employees and 112 or more employees.

On the basis of the survey respondents' reported industrial sector, we utilized a crosswalk that collapses specific US Census Industry Codes into the four broad sectors (white collar, service, blue collar, and farm) used by the National Center for Health Statistics.[35,36]

For bivariate analyses, the level of implementation of OSH activities was divided into lower levels (having 0 to 8 OSH programs and policies) and higher levels (having 9 to 10 OSH programs and policies), with the cut points at the mean number of OSH programs and policies. Similarly, the level of implementation of WHP activities was divided at the mean into lower levels (having 0 to 9 OSH programs and policies) and higher levels (having 10 to 19 WHP programs and policies). For the two-way analyses of variance (ANOVA), we used the implementation of OSH and WHP variables as continuous (described above under the section ''Implementation of OSH and WHP Activities'').

## Data Analyses

### Descriptives, Bivariates, and Correlations

We conducted descriptive analyses for continuous variables, expressed as means, plus or minus the standard error of the means, and for categorical variables, represented as frequency and percentage of the sample.

We examined the main outcomes of employer OSH and WHP implementation, stratified by size, sector, presence of top leadership support, and capacity. For categorical data, we conducted chi-squared analyses to compare groups, and used *t* tests for continuous data. We used Levene's test of homogeneity[37] to determine whether the variance was equal for each variable. Statistical tests indicating that findings had less than a 5% probability of being because of chance were considered statistically significant. We used Pearson product-moment correlation to examine the relationship between the number of OSH and WHP activities in companies.

### Multivariate Analyses

We used the bivariate analyses to determine organizational factors that were statistically significant for both OSH and WHP implementation to incorporate into the final models in the multivariate analyses. We conducted an ANOVA to determine whether significant differences existed for either main effect of the number of capacity factors (range of 0 to 3) or existence of leadership support (0, 1) for implementation of OSH and WHP, while adjusting for the other significant factor. After running the model, if either of the main effects (ie, leadership support or capacity) was significant, we used a Tukey post hoc test to identify specific differences. All statistical analyses performed used SAS v9.3 (SAS Institute Inc, Cary, NC) and SPSS v21 (IBM Corp, Armonk, NY).

# RESULTS

Out of the 400 web-based surveys distributed to companies in the Upper Mid-West, 117 organizations responded, yielding a response rate of 29%. With information available on size and sector from the lists of companies used in this study, we examined differences between respondents and nonrespondents. Compared with the 283 nonresponding companies, survey respondents were significantly more likely than nonrespondents to be from smaller companies (<112 employees) ($P = 0.022$, data not shown). No statistically significant differences existed in response by industrial sector (ie, white collar, service, and blue collar and farm) between respondents and nonrespondents ($P = 0.179$, data not shown).

## Organizational Characteristics

### Size and Sector

Companies employed between 7 and 735 people, with a median of 112 employees. As indicated in Table 2, more than half (53%) of the respondents reported they were from companies with North American Industry Classification System (NAICS) codes in the white-collar sector, about 18% were from the service sector, and about 29% were from the blue-collar and farming sectors.

### Organizational Supports—Top Leadership Support and OSH and WHP Capacity

Organizational supports for OSH and WHP include top leadership support and capacity (defined as having a dedicated budget, staff, and committee for OSH/WHP). As indicated in Table 2, companies reported a higher proportion of top leadership support and capacity for OSH, as compared with WHP. For instance, about 80% of respondents reported top leadership support for OSH at their companies, whereas about 64% responded that top leaders supported WHP. For both OSH and WHP, responding employers were more likely to report they had dedicated staff and a worksite committee than to have a specific budget for OSH or WHP. Less than a quarter of companies reported that they had all three capacities for OSH (22.2%) or WHP (15.4%).

**TABLE 2.** Descriptive Organizational Characteristics Among Smaller Organizations Participating in a Management Survey, September 2013 to March 2014 ($n = 117$)

| Organizational Characteristics | $n^*$ (%) |
|---|---|
| Number of employees in organization | |
| 1–111 | 60 (51.7) |
| 112–750 | 56 (48.3) |
| Industrial sector | |
| White-collar sector | 62 (53.0) |
| Educational services | 3 (2.6) |
| Finance and insurance | 5 (4.3) |
| Information | 4 (3.4) |
| Professional, scientific, and technical services | 24 (20.5) |
| Public administration | 5 (4.3) |
| Real estate and rental and leasing | 1 (0.9) |
| Retail trade | 5 (4.3) |
| Wholesale trade | 7 (6.0) |
| Arts, entertainment, and recreation | 8 (6.8) |
| Service sector | 21 (17.9) |
| Accommodation and food services | 1 (0.9) |
| Administrative and support and waste management | 1 (0.9) |
| Health care and social assistance | 13 (11.1) |
| Other services | 6 (5.1) |
| Blue-collar and farming sectors | 34 (29.1) |
| Construction | 7 (6.0) |
| Manufacturing | 23 (19.7) |
| Transportation and warehousing | 1 (0.9) |
| Utilities | 2 (1.7) |
| Agriculture, forestry, fishing, and hunting | 1 (0.9) |
| Top leadership supports | |
| OSH | 94 (80.3) |
| WHP | 75 (64.1) |
| Capacity for OSH | |
| Dedicated budget for OSH | 41 (35.3) |
| Dedicated staff person responsible for OSH | 75 (64.7) |
| Worksite has OSH committee | 73 (62.4) |
| Has all three OSH capacities | 26 (22.2) |
| Capacity for WHP | |
| Dedicated budget for worksite wellness | 29 (24.8) |
| Dedicated staff person responsible for wellness | 42 (36.5) |
| Worksite has worksite wellness committee | 35 (30.7) |
| Has all three WHP capacities | 18 (15.4) |
| Capacity means | Mean (SD) |
| OSH | 1.62 (1.03) |
| WHP | 0.91 (1.15) |

*Differences from sample $n$ because of item nonresponse or missing.

OSH, occupational safety and health; SD, standard deviation; WHP, worksite health promotion.

**TABLE 3.** Occupational Safety and Health and Worksite Health Promotion Programs, Policies, And Practices Among Smaller Organizations Participating in a Management Survey, September 2013 to March 2014 ($n = 117$)

| Policies, Programs, and Practices | $n$ (%) |
|---|---|
| Occupational safety and health | |
| Employees can report safety hazards/problems | 116 (99.1) |
| Feedback to employees reporting hazards/problems | 101 (92.7) |
| New employee OSH orientation | 100 (85.5) |
| OSH program present | 98 (83.8) |
| Hourly employees provided OSH training | 97 (82.9) |
| Managers held accountable for OSH | 91 (82.0) |
| Supervisors/managers provided OSH training | 94 (81.0) |
| Written OSH program policy statement | 91 (77.8) |
| OSH program updated regularly | 85 (73.9) |
| Management sets safety goals at worksite | 72 (61.5) |
| Worksite health promotion written policy | |
| Drugs prohibited at worksite | 115 (98.3) |
| Alcohol use prohibited at worksite | 112 (97.4) |
| Firearms prohibited at worksite | 89 (76.7) |
| Employee counseling | 82 (73.2) |
| Tobacco prohibited at worksite | 76 (65.0) |
| Occupant protection seatbelt use in travel | 65 (59.6) |
| Physical activity allowed/fitness breaks | 23 (20.0) |
| Nutrition for healthy food options at company events | 16 (13.9) |
| Worksite health promotion programming | |
| Employee assistant program | 100 (86.2) |
| Physical activity/fitness programs | 51 (44.3) |
| On-site educational programs | 43 (37.1) |
| Health risk assessment | 37 (31.6) |
| Health screenings | 34 (29.1) |
| Individual coaching/counseling | 29 (25.2) |
| Health promoting context of worksite | |
| Vending machines for food/beverages | 95 (82.6) |
| On-site shower facilities | 40 (34.5) |
| Promotions/discounts for healthy food choices | 19 (16.8) |
| Have cafeteria | 20 (17.2) |
| Label food choices in cafeteria | 13 (12.0) |
| Means | Mean (SD) |
| Occupational health and safety activities | 8.1 (0.2) |
| Worksite health promotion activities | 9.1 (0.3) |

OSH, occupational safety and health.

## OSH and WHP Policies and Programs

All companies reported that they had at least one OSH or WHP activity; the number of OSH activities ranged from 1 to 10, and WHP activities from 3 to 19. Table 3 indicates that more than 75% of companies reported having at least 8 OSH policies, training efforts, and programs. Slightly fewer respondents reported updating the OSH program policy regularly. About two thirds said that management regularly sets safety goals.

The most reported WHP activities included having a written policy banning drug and alcohol use while on the job, having an employee assistance program, and having a vending machine for food/beverages. In contrast, fewer than half of the respondents reported that their companies provide health promotion activities requiring resources such as fitness discounts, educational programs, or have on-site shower facilities. Less than a third of companies reported conducting health risk appraisals or health screenings, providing individual health coaching, or having health promoting environmental supports such as promotions or discounts for healthy foods.

## Organizational Characteristics and Implementation Levels of OSH and WHP

As indicated in Table 4, different sectors had significantly different levels of OSH implementation ($P = 0.003$), with the blue-collar and farming sector having higher levels of OSH implementation compared with both the white-collar and service sectors. Company size was not significantly related to the extent of implementation of either OSH or WHP.

Top leadership support and capacity (ie, dedicated staff, committee, and budget) were the organizational characteristics most strongly associated with the levels of OSH and WHP implementation. For OSH, top leadership support and capacity were significantly related to having higher levels of implementation of OSH activities ($P < 0.001$). Although capacity for WHP was also significantly related to higher levels of implementation of WHP activities ($P < 0.001$), top leadership support was associated with lower levels of WHP implementation ($P = 0.008$).

**TABLE 4.** Implementation of Occupational Safety and Health and Worksite Health Promotion Activities by Organizational Characteristics of Smaller Organizations Participating in a Management Survey, September 2013 to March 2014 ($n = 117$)

| Characteristics | Sample Total $n$† (%) | Lower OSH Implementation* $n$† (%) | Higher OSH Implementation* $n$† (%) | $P$ Value |
|---|---|---|---|---|
| Total | 117 (100.0) | 49 (41.9) | 68 (58.1) | |
| Worksite size | | | | |
| ≤111 | 60 (51.7) | 24 (40.0) | 36 (60.0) | 0.375 |
| ≥112 | 56 (48.3) | 25 (44.6) | 31 (55.4) | |
| Industrial sector | | | | |
| White collar | 62 (53.0) | 32 (51.6) | 30 (48.4) | 0.003 |
| Service | 21 (17.9) | 11 (52.4) | 10 (47.6) | |
| Blue collar and farm | 34 (29.1) | 6 (17.6) | 28 (82.4) | |
| Leadership support | | | | |
| Top leadership support | 94 (80.3) | 30 (31.9) | 64 (68.1) | <0.001 |
| Mean scoring | Mean (SD) | Mean (SD) | Mean (SD) | |
| OSH capacity factors | 1.62 (1.03) | 1.02 (1.03) | 2.04 (0.80) | <0.001 |

| Characteristics | Sample Total $n$† (%†) | Lower WHP Implementation* $n$† (%†) | Higher WHP Implementation* $n$† (%)† | $P$ Value |
|---|---|---|---|---|
| Total | 117 (100.0) | 71 (61.2) | 45 (38.8) | |
| Worksite size | | | | |
| ≤111 | 60 (51.7) | 38 (63.3) | 22 (36.7) | 0.384 |
| ≥112 | 56 (48.3) | 33 (58.9) | 23 (41.1) | |
| Industrial sector | | | | |
| White collar | 62 (53.0) | 33 (53.2) | 29 (46.8) | 0.207 |
| Service | 21 (17.9) | 15 (71.4) | 6 (28.6) | |
| Blue collar and farm | 34 (29.1) | 23 (67.6) | 11 (32.4) | |
| Leadership support | | | | |
| Top leadership support | 75 (64.1) | 39 (52.0) | 36 (48.0) | 0.008 |
| Mean scoring | Mean (SD) | Mean (SD) | Mean (SD) | |
| WHP capacity factors | 0.91 (1.15) | 0.35 (0.74) | 1.76 (1.14) | <0.001 |

*Lower OSH implementation = between 0 and 8 activities; higher OSH implementation = between 9 and 10 activities; lower WHP implementation = between 0 and 9 activities; higher WHP implementation = between 10 and 19 activities.

†Differences from sample $n$ because of item nonresponse or missing.

OSH, occupational safety and health; SD, standard deviation; WHP, worksite health promotion.

## Correlation Between Numbers of OSH and WHP Activities

A Pearson product-moment correlation coefficient was computed to assess the relationship between OSH and WHP activities. There was no significant correlation ($r = 0.15$; $P = 0.103$) between the numbers of OSH and WHP activities (data not shown).

## Relationships of Capacity and Leadership Support to Implementation of OSH and WHP Activities

In bivariate analyses, only leadership support and capacity were significantly related to implementation of both OSH and WHP activities. Hence, these were the two sole organizational characteristics investigated in ANOVA.

As indicated in Table 5, having top OSH leadership support ($P = 0.001$) and higher numbers of OSH capacity factors ($P < 0.001$) are both individually associated with employer implementation of OSH. In the last column in Table 5, we see that leadership support explains 8.8% of the variance found in OSH implementation and OSH capacity (OSH committee, dedicated staff, budget), which accounts for 30.2% of the variance.

For WHP, only capacity was significantly associated with WHP implementation; having higher numbers of WHP capacity factors was significantly associated with implementing higher numbers of WHP activities ($P < 0.001$). Table 5 indicates that approximately 31% of the variance in WHP implementation is accounted for by WHP capacity, suggesting having a dedicated staff person, WHP committee, and/or budget plays a larger role in implementing WHP than having top leadership support.

**TABLE 5.** Organizational Characteristics Associated With Occupational Safety and Health and Worksite Health Promotion Implementation: Analyses of Variance of Smaller Organizations Participating in a Management Survey, September 2013 to March 2014 ($n = 117$)

| Characteristic | Mean of Square | F | $P$ Value | Partial $\eta^2$ |
|---|---|---|---|---|
| OSH | | | | |
| Leadership support | 32.62 | 10.780 | 0.001 | 0.088 |
| Capacity factors* | 48.88 | 16.153 | <0.001 | 0.302 |
| WHP | | | | |
| Leadership support | 0.17 | 0.029 | 0.865 | 0.000 |
| Capacity factors* | 102.00 | 16.917 | <0.001 | 0.312 |

*Capacity factors = number of factors of existence of dedicated staff, committee, budget for OSH and WHP, respectively.

OSH, occupational safety and health; WHP, worksite health promotion.

## DISCUSSION

Various organizations have highlighted the importance of understanding the practices and needs of smaller organizations in relation to their adoption and implementation of OSH and WHP,[38–40] and there have been recent calls for leaders of smaller organizations to

become more involved in worksite health promotion and protection.[24,41] This study contributes knowledge about implementation of OSH and WHP activities in smaller organizations in the Upper Mid-West, as well as how organizational factors, including leadership support and capacity, may be related to this implementation. Nearly all respondents reported some level of activity in both OSH (99%) and WHP (98%), and the overall proportion of measured OSH activities implemented was higher than that of WHP. We found that size was not significantly related to implementation of OSH or WHP; industrial sector was associated with implementation levels of OSH, but not WHP. We did not find a strong correlation between implementation of OSH and WHP activities. To our knowledge, this is the first study that investigates capacity, in terms of dedicated budgets, staff, and committees, across OSH and WHP in the same group of smaller organizations. We found that top leadership support was important to implementation of OSH but having accompanying resources, in terms of dedicated budgets, staff, and committees for OSH and WHP, was even more strongly related to implementation, especially for WHP.

Because regulations exist for OSH activities, it is not surprising that nearly three quarters of the respondents said they conducted 9 of the 10 potential OSH activities. That suggests, however, that nearly one quarter are either noncompliant with OSH best practices or are either at low risk or too small for the regulations to apply. Although not mandated, national programs and policies encourage implementation of WHP among smaller organizations, including "Work@Health"®[38] from the Centers for Disease Control and the Prevention and the Affordable Care Act.[25] There were relatively high levels of implementation of WHP (>65%), especially related to activities that were no or low cost (eg, written drug, tobacco, alcohol, and firearm policies). Activities that required organizations to expend more financial resources (eg, health risk assessments or health coaching) showed lower rates of implementation (<32%). A study in Massachusetts reported comparable findings related to the implementation of OSH and WHP activities.[22] These levels of worksite implementation of OSH and WHP leave room for improvement in how employers are promoting and protecting worker health in smaller organizations. Following OSH best practices and being in compliance with OSHA mandates should be the priority for all organizations.

Others have noted the importance of capacity (dedicated staff, committees, and budgets) for implementation of OSH or WHP.[19–21] As the first study that investigates these factors across OSH and WHP in the same groups of smaller organizations, we found that only 22% of the companies reported full capacity (in terms of having staff, a budget, and a committee) for OSH, and only 15% for WHP.

Size was not significantly related to implementation of OSH or WHP activities. This finding contrasts with other studies' findings that implementation levels of both OSH and WHP increase with increasing size.[20–22,25] Apart from the study conducted by Sinclair and Cunningham, the referenced studies did not limit the size of the organization. We limited our sample to companies employing 750 employees or fewer; it may be that size matters most when the size range is larger than that included in this study. Noting the inconsistency of our results with the literature, we conducted multiple tests using different size categories, including tertiles and quartiles, and also using the mean of size and size as a continuous variable. We also tested different levels of implementation to see whether that would provide different conclusions. Following Tremblay and colleagues,[22] we divided WHP activities into those that were reflective of policy only, and those WHP activities that were reflective of programs and environmental supports. We then tested whether size might be significantly associated with these two groups of WHP activities. Finally, we tested different multivariate techniques including linear and logistic regression; the results were not significantly different from the bivariate and ANOVA results. Throughout all these tests, size was not significantly associated with implementation of OSH or WHP. We thoroughly explored the relationship between company size and our outcomes and feel confident that the median split that we used for size offers concise presentation of the variable, while remaining consistent in how it relates to our chosen outcome variables as well. It may be that different-sized smaller organizations are more homogenous in what they implement than the larger organizations included in literature.

We found that industrial sector was significantly associated with implementation levels of OSH, but not WHP. In particular, companies from the blue-collar sector had significantly higher levels of OSH compared with companies from either the white-collar or service sectors. This may not be surprising as the impetus for OSHA regulations came out of the manufacturing environment. The lack of statistical association between sector and implementation levels of WHP is interesting and deserves further study; other investigators have noted differences, though statistical significance was not reported in those studies.[19,22]

We found an unexpected lack of correlation between OSH and WHP activities. Tremblay and colleagues found a moderate correlation between OSH and WHP activities in a Massachusetts sample,[22] but their study was not limited to smaller organizations, which may have impacted results. Our findings seem to suggest that among companies of this size, having stronger OSH programming does not mean necessarily that they will have equally strong WHP activities.

Although other studies looked at size and sector in relation to implementation of OSH and WHP, this study also investigated top leadership support and capacity. As expected, leadership support was associated with higher levels of OSH implementation.[23] Nevertheless, it was associated with lower levels of WHP implementation in the bivariate analyses. This may mean that leadership support, without investing resources into building capacity, is insufficient in and of itself to foster implementation of WHP. This observation is substantiated by the regression analysis results that indicate that capacity, and not leadership support, was significantly associated with higher implementation numbers of WHP activities. Indeed, having capacity in terms of budget, staff, and a committee seems to have the strongest impact on implementation of both OSH and WHP analyses. Top leaders of smaller organizations who support OSH and WHP are encouraged to translate that vision into tangible organizational resources, including budgets, committees, and staff to further the success of implementation efforts.

Although company size and industrial sector are organizational factors that have been found to influence OSH and WHP implementation,[19–22] they are not ones that can be changed easily without significant reorganizations occurring within companies. Leadership support and capacity can be addressed in a company; size and sector are more fixed attributes. Given its particular strength in this study, further investigation of the role of capacity for OSH and WHP implementation is warranted. Future efforts with a larger sample may be able to discern whether particular components of capacity have stronger influences than others. In addition, leaders of vanguard companies where capacity is strong for OSH and WHP may be able to influence industry norms and standards by advocating among their peers about the importance of both leadership and capacity.

Several limitations of this study should be noted. Although the overall response rate of 29% was low, it is typical for web-based self-response surveys.[42] Nevertheless, responding companies might have been those more likely to have OSH and WHP activities. We assessed representativeness with available data and found that the responding organizations' industrial sectors were similar to nonrespondents, but respondents were disproportionally from

 

smaller-sized organizations. The small sample size based in a limited geographical area may have impacted results. This may have been especially true with the lack of association between size of the company and levels of implementation of WHP and OSH. All OSH and WHP activities were given an equal weight in analyses, which could be a limitation. We are not aware of a weighting schema for individual OSH and WHP activities, and activities used were from recognized sources.[20,31,32,43] An additional limitation is that no standard measures exist for top leadership support and capacity,[44] though the capacity item we use has been used previously in the WHP literature.[19] Finally, as with all cross-sectional surveys, the associations found do not imply causality.

The study has several strengths. This study contributes to understanding the implementation of both OSH and WHP by focusing on one geographical region in the Upper Mid-West and augments findings from a Massachusetts study investigating relationships between some similar organizational factors and the implementation of WHP and OSH.[22] Because currently there is no national worksite health survey of OSH and WHP implementation, it is important to investigate implementation at state and regional levels to begin to develop an understanding of these issues. The focus on smaller organizations is also novel and important as most employees in the United States work in a smaller organization.[27] The companies surveyed came from a wide variety of industrial sectors, and were representative of industry sectors in this geographical region. Finally, this investigation is the first to examine the organizational characteristics of leadership support and capacity and their important relationships to implementation of WHP and OSH in smaller organizations.

## CONCLUSIONS

This study contributes important information about factors influencing the implementation of OSH and WHP in smaller organizations based in one geographical region of the United States. Comparable data across the United States would be useful; nevertheless, it has been a decade since the last national worksite health survey was conducted. A new national worksite health survey that includes questions about organizational characteristics and factors related to implementation of both OSH and WHP could substantially increase overall knowledge of the situation in smaller organizations. Our results suggest that more investigation of the roles of capacity and leadership support for implementation of OSH and WHP is warranted. Also, assessing the reasons why leaders and managers support OSH and WHP is another area for future study. Smaller organizations' leaders' support may be important but not sufficient without concomitant organizational resources to increase OSH and WHP implementation, and to protect and promote worker health and safety. Finally, as the NIOSH Total Worker Health™ initiative aims to increase the integration of OSH and WHP, it may consider leadership support and capacity as important indicators of integration and factors amenable to timely organizational change in implementing Total Worker Health™ approaches in smaller organizations.

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