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## Key organizational characteristics for integrated approaches to protect and promote worker health in smaller enterprises

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### Abstract

**Objective**—To investigate relationships between worksite organizational characteristics (size, industrial sector, leadership commitment, and organizational supports) and integrated approaches to protecting and promoting worker health implemented in smaller enterprises.

**Methods**—We analyzed web-based survey data of Human Resource Managers at 114 smaller enterprises (<750 employees) to identify organizational factors associated with levels of integrated approaches among their worksites.

**Results**—The companies' mean integration score was 13.6 (SD = 9.6) of a possible 44. In multivariate analyses, having a safety committee ( $P=0.035$ ) and top leadership support for health promotion (HP) ( $P=0.004$ ) were positively associated with higher integration scores.

**Conclusions**—Smaller enterprises in one U.S. region have relatively low levels of implementing integrated safety and promotion approaches. Having a safety committee and leadership support for HP may be important contributors to implementing integrated approaches in smaller enterprises.

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## Keywords

integrated worksite health protection and promotion approaches; occupational safety and health; worksite well-being; small business/enterprise; Total Worker Health<sup>®</sup>; organizational characteristics for worksite safety and health

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The practices of occupational safety and health and worksite health promotion have traditionally operated separately. Certain organizational characteristics, including size, industrial sector, leadership commitment, and organizational supports are linked to these practices. (1–10) Evidence is emerging from research and practitioners in support of the benefits of initiatives that integrate approaches to protect and promote worker safety and health, rather than having them operate separately. (11–26) The National Institute for Occupational Safety and Health's (NIOSH) Total Worker Health<sup>®</sup> Initiative (TWH) supports integrated efforts and encourages more organizations across the nation to use them, though research identifying characteristics of organizations influencing implementation is lacking. There is little evidence on whether organizational characteristics such as size, industrial sector, leadership, and organizational supports are linked to integrated worksite approaches, as they have been linked within the independent practices of health protection and health promotion.

In 2013, Sorensen and colleagues proposed indicators of integration specifically designed to answer the question: How will we know integrated approaches when we see them?(27) Twenty-three items emerged that could be measured along a continuum, with higher levels of each suggesting greater implementation of integrated approaches at a worksite. The measure, displayed in Table 1, has since been utilized in the field and validated. (27–29)

We investigated relationships among organizational characteristics of worksites (i.e., size, industrial sector, leadership commitment, and organizational supports) and the levels of integrated approaches implemented in smaller enterprises. We used the Sorensen indicators of integration tool among a sample of enterprises employing less than 750 employees in the Upper Midwest.

## METHODS

This paper utilized data from a cross-sectional survey deployed as part of a larger observational study investigating the needs and interests of smaller enterprises in implementing integrated approaches to health promotion and worker safety. The sample, survey, and survey procedures were described previously(8); the full survey is available from the authors upon request. Briefly, we obtained two lists of human resource directors/managers from the Minnesota Chamber of Commerce and from a Minnesota-based insurance brokerage firm to identify potential participants. Between September 2013 and March 2014, the research team e-mailed web-based surveys to Human Resources directors/managers representing management at all 400 enterprises from these lists that employed less than 750 employees in Upper Midwestern states. Survey respondents were provided a \$25 Amazon gift card as an incentive for their participation.

## Measures

**Integration score**—Based on reviews of literature, discussions with businesses, and a modified Delphi process, Sorensen and colleagues proposed indicators of integration.(27) Four overall indicator domains emerged: 1) organizational leadership and commitment; 2) collaboration between health protection and health promotion; 3) supportive organizational policies and practices (including accountability and training, management and employee engagement, supportive incentives, and integrated evaluation and surveillance); and 4) comprehensive program content. The indicators were not meant to be a comprehensive assessment of all facets related to worksite safety, health, and well-being, but to gauge an overall level of implementation of integrated approaches.

Since the measure was introduced, it has been tested in two separate samples and analyzed for validity and dimensionality. Convergent validity and excellent reliability were found in the testing of the measurement tool.(28) As part of a factor analysis performed using two samples, the 23 items seem to perform well as a single index.(29)

The four overall domains mentioned above were assessed with a total of 23 items each of which had response categories of either “absent,” “partially adopted,” or “fully adopted.” One of the 23 items (on worker engagement in planning health protection and health promotion activities) was inadvertently omitted from the web survey; the remaining 22 items used in this study are displayed in Table 1. Responses of “absent” were scored as 0, “partially adopted” scored as 1, and “fully adopted” scored as 2, yielding a potential integration score for each enterprise ranging from between 0 and 44 (as one question was inadvertently left off the survey).

**Size and sector**—Size was defined as the number of employees at each worksite, with a maximum of 750, and measured categorically (0–99, 100–199, 200 employees and over).

Industrial sector was ascertained using the North American Industrial Classification System (NAICS)(30), and collapsed to include three overall occupational classes: white-collar, blue-collar, and service.(31) Our reporting of the results uses occupational classes.

**Leadership support**—We measured leadership support for occupational safety and health (OSH) and worksite health promotion (WHP) as separate items, assessing whether there was a top leader at the worksite who was 1) a strong supporter for OSH, and/or 2) a strong supporter for WHP.(32) Response options for both measures were dichotomous (yes/no).

**Organizational supports**—We used six separate dichotomous measures (yes/no) for organizational supports. For organizational supports for OSH, respondents reported whether their enterprise had a dedicated staff person responsible for OSH, a dedicated OSH budget, and an OSH committee. Similarly, for WHP, respondents reported whether their enterprise had dedicated WHP staff, a dedicated WHP budget, and a WHP committee.(1, 3)

## Data analyses

We conducted descriptive analyses: the mean and standard deviation were calculated for the integration score, while categorical variables are reported as percentages and frequencies.

We also performed bivariate analyses of the associations between the main outcome variable -- the summed integration score for each enterprise -- and each of the study variables: size, occupational class, leadership support for OSH, OSH staff, OSH budget, OSH committee, leadership support for WHP, WHP staff, WHP budget, and WHP committee. For the non-ordered categorical variables (occupational class) we used an ANOVA to determine associations with integration score. We used Spearman rank correlation coefficients with Bonferroni corrections to characterize the associations between size categories and integration score, and calculated p values using t-tests for the rest of the variables that were dichotomous.

Finally, to determine whether significant differences existed in the integration score by organizational characteristics, we used the ordinary least squares method to regress the integration score on size, occupational class, leadership support for OSH, OSH staff, OSH budget, OSH committee, leadership support for WHP, WHP staff, WHP budget, and WHP committee. After the regression, the Variance Inflation Factors (VIFs) were checked for correlations between covariates. All statistical analyses were conducted using STATA 13.1. (33)

## RESULTS

We received 117 responses to the web-based survey from the 400 that we distributed, yielding a response rate of 29%. We deleted three surveys from these 117 since they had incomplete information on the variables of interest; our final number of observations used in analyses was 114. As reported previously,(8) compared with non-respondents, respondents were more likely to be from smaller organizations of less than 112 employees (P=0.02, data not shown), but no statistically significant differences in response occurred by industrial sector. Size and industrial sector were the only organizational characteristics we had information on from respondents and non-respondents.

### Descriptive statistics

Out of a possible score of 44, the mean integration score reported was 13.6 (SD = 9.6) and the median was 12 (observed range [0,43], data not presented). As Table 2 shows, about three-quarters of the companies had fewer than 200 workers. Almost half of the companies were classified in the “white-collar” occupational class category. A relatively high percentage of companies reported having leadership around OSH, with relatively fewer companies reporting leadership around WHP, though still well over a majority of the sample. Of measures related to organizational supports for OSH and WHP, the fewest respondents reported having a dedicated WHP budget, although similarly few respondents reported having WHP staff and committees or dedicated OSH budgets.

### Associations between integration score and organizational characteristics

In bivariate analyses, having: OSH leadership, a dedicated OSH staff person, a budget for OSH, and an OSH committee were positively associated with having a higher integration score (Table 3). Having a top leader supportive of WHP, a dedicated WHP staff person, a budget for WHP, and a WHP committee were also positively associated with having a higher

integration score. Not having leadership support for OSH was associated with the lowest mean integration score (7.3), while having a dedicated budget for WHP was associated with the highest mean integration score (19.2). Size and occupational class were not significantly associated at the  $P < .05$  level with integration score.

When all organizational characteristics were included in the regression model, having an OSH committee ( $P = 0.035$ ) and a top leader supportive of WHP ( $P = 0.004$ ) were positively associated with higher integration scores. As suggested in Table 4, having an OSH committee was associated with a higher integration score by about 4 points, and having top leadership support for WHP was associated with a higher integration score by over 5 points, holding everything else constant. Neither size or occupational class, nor having top leadership support for OSH, dedicated OSH staff or budget, or WHP staff, budget, or committee were significantly associated with integration scores. Collinearity does not appear to be a problem, as the highest VIF was 3.2 for one of the size category indicators, with the mean VIF being 1.88.

## DISCUSSION

This study provides initial information about organizational characteristics associated with levels of integrated approaches at smaller enterprises in Upper Midwestern states using a validated tool specifically designed to measure integration. Out of a potential score of 44, the mean integration score reported was 13.6, suggesting that these smaller enterprises were in the preliminary phases of implementing integrated approaches. In the full model, size, occupational class, and a series of other OSH and WHP organizational characteristics were not associated with enterprises' integration scores.

We found that having top leadership support for WHP and having an OSH committee were significantly associated with increased integration scores. Our finding about the importance of leadership support echoes other findings in the literature of the separate disciplines of WHP and OSH.(7, 9, 10) It is intriguing that OSH leadership support was not significantly associated with integration score in the full model. This may be because many worksites are mandated to have certain OSH activities as a regulatory requirement by the Occupational Safety and Health Administration, so the worksites need to conduct OSH activities anyway. Having a top leader supportive of WHP may be indicative of organizations that may be more interested in implementing innovations such as integrated approaches to worker health protection and promotion and have the resources and will to do so.

While having top leadership support may be helpful in launching efforts and driving success, having the capacity to implement integrated approaches in an organization requires infrastructure. Committees may assist in implementation efforts. Since labor-management OSH committees are required by state legislation in Minnesota for employers having more than 25 workers, most of the enterprises in this sample should have committees in place to conduct some level of OSH activities.(34) The Minnesota Department of Labor and Industry provides guidelines to employers for developing labor/management safety committees that include wide employee representation, including management, supervisory staff, and workers.(34) Inclusion of workers as well as supervisors on safety activities may spur a

more worker-centered and reflective approach not only to safety, but also to health and integrated approaches.

Size was not significantly associated with integration score. Noting this finding counters literature in the separate disciplines of OSH and WHP, we conducted sensitivity analyses using different size scenarios, including using size as continuous, and differing levels of categorical variables. We also assessed whether an enterprise was part of a larger organization would impact integration score. In all of these additional analyses, size was not significantly associated with the integration score (data not shown). As mentioned above, most studies investigate differences in adoption/implementation of either OSH or WHP. Even in some of the more recent studies where inquiries about implementation of an integrated approach is attempted, questions about OSH and WHP are separated, or just one question addressing integrated approaches is included.(1, 2, 6) One study by Tremblay and colleagues, assessed whether there was coordination of OSH and WHP efforts in a Massachusetts sample and reported that it was more common in worksites with over 100 employees than among those with fewer than 50.(6) While in our bi-variate results the trend in our study was toward significance and the mean integration score was progressively higher for each size category (Table 3), the multivariate results did not support that trend (Table 4). More research into the relationships between size and level of integration is, therefore, warranted. Our finding related to size may in part be related to a lack of variability in organizational size in our sample, given that the maximum worksite size was 750 employees.

There are some limitations to this study. The response rate of 29% is consistent with those from web-based surveys, (35) but may represent a source of bias. We did not have access to data on whether respondents were more likely to implement integrated approaches than non-respondents. Selection and information bias may exist. We surveyed Human Resource directors, as these are managers who in smaller organizations often have the most information about organizational characteristics and of what is occurring regarding safety, health, and well-being. The data gathered, therefore, reflects management's perspectives; others in non-managerial positions might have responded differently. This study was an effort to assess management perspectives. Information bias is always a concern in self report survey work. No data exists on potential bias from whether respondents were more likely to be from organizations that implement integrated approaches than non-respondents, or were more likely to report a better picture of characteristics or activities than non-respondents. Non-respondents were more likely to be from larger organizations than respondents, but did not differ by industrial sector. To address potential biases, our final model adjusted for organizational factors that can influence activity implementation including organizational size, occupational class, leadership support for OSH, OSH staff, OSH budget, OSH committee, leadership support for WHP, WHP staff, WHP budget, and WHP committee. Future investigations could improve generalizability through at least three concrete methods: (1) a larger sample size from a broader geographical area may have yielded more discernible associations between organizational characteristics and integration score, (2) improving response rates to reduce concerns about selection bias, and (3) obtaining workers' perspectives might provide additional insight into policies and practices to improve worksite health promotion and protection.

Another potential limitation is that one of the domains of the indicators of integration, leadership support and commitment to a culture of health and an environment that supports employee health (item 1 of Table 1), might overlap with top leadership support for OSH and WHP. To address this concern, we conducted additional analyses to see whether those who responded that they had OSH and/or WHP support also responded that they had top management commitment to a workplace culture and environment that supports employee health (the indicators of integration question). The results confirmed that answers to the questions were not highly correlated. Finally, since this was a cross-sectional study, we do not know whether the associations reported are causal.

The study also had a number of strengths. This study is one of the first utilizing a validated tool that is specifically designed to measure integrated approaches to worker safety, health, and well-being (available for free download and use at <http://centerforworkhealth.sph.harvard.edu/resources/indicators-integration> ). While the measure was used in this study as a research tool to assess associations between organizational factors and integrated approaches, the tool has research-to-practice implications, as it could also be used to analyze gaps and inform intervention strategies at organizations.(36) Most surveys/tools reported in the literature address Total Worker Health® approaches by including a number of questions on separate programs, policies, and practices related to OSH, WHP, population health issues, disease management, etc.(1, 2, 6, 37) Although recent articles and initiatives have proposed and begun to analyze measures of integration, most of these efforts are intricate with hundreds of specific items being proposed.(2, 37, 38) The American College of Occupational and Environmental Medicine (ACOEM) recently published a guidance statement on measuring integration approaches in the workplace using an Integrated Health and Safety Index that is being built on indicators of the Dow Jones Sustainability Index (DJSI) and ACOEM's Corporate Health Achievement Award (CHAA) process.(38) The DJSI's set has over 100 indicators and the CHAA self-assessment has about 400 specific indicators.(39) Generally, the DSJI and CHAA are geared towards larger, well-resourced organizations.(40) Participating in measurement efforts such as these may be daunting to some organizations, especially smaller ones. ACOEM's proposed Integrated Health and Safety Index has not yet been fully tested and reported on, and while promising, its creators recognize that a new model needs to be created for small- to medium-sized enterprises.(38) The Sorensen tool has 23 indicators which may be more straight-forward for small- to medium-sized enterprises to employ. We also observed variation across study respondents, which supports the notion that enterprises fall along a continuum of implementing integrated approaches.(27) This study also sheds light on organizational characteristics associated with integrated approaches in enterprises for which there is not much information: smaller ones with less than 750 employees. While it focuses on smaller enterprises in the Upper Midwest of the U.S., it provides preliminary evidence that may spawn future efforts in wider geographical areas and with larger samples.

## CONCLUSION

Utilizing a validated tool specifically designed to measure integrated approaches to worker health protection and promotion, we found that small- to medium-sized enterprises in one geographical region of the United States have relatively low levels of using integrated

approaches. While the results need to be investigated further in larger and more geographically dispersed organizations, it appears that having both leadership support for WHP and an OSH committee may be important contributors to implementing integrated approaches. In particular, leaders who are strong supporters of promoting worker health, beyond conducting mandated worksite occupational safety and health activities, may be especially responsive to implementing integrated approaches. OSH committees that include worker participation may be particularly important for implementing this approach to protecting and promoting worker safety and health. Future research and more widespread analyses of the indicators of integration tool could be used to determine whether beneficial outcomes related to worker health and safety occur due to implementation efforts among smaller enterprises.

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**Clinical Significance**

Practitioners in smaller enterprises may consider having a safety committee with employee input and leadership support for worksite health promotion as important contributors to implementing integrated approaches. The indicators of integration tool may be used in smaller enterprises to gauge the overall level of implementation of integrated approaches.

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**Table 1.**

Questions about the Extent of Integration of Worksite Safety and Health Policies, Programs, and Practices <sup>1</sup>

Question Construct
(1) Top management expresses its commitment to a culture of health and an environment that supports employee health
(2) Both worker and worksite health are included as part of the organization’s mission
(3) Senior leadership allocates adequate human and fiscal resources to implement programs to promote and protect worker health
(4) Decision making about policies, programs, and practices related to worker health is coordinated across departments, including those responsible for occupational safety & health and those responsible for worksite wellness
(5) Processes are in place to coordinate and leverage interdepartmental budgets allocated toward both worksite wellness and occupational safety and health.
(6) Efforts to promote and protect worker health include both policies about the work organization and environment and education and programs for individual workers
(7) Program managers responsible for worksite wellness and OSH are trained to coordinate and implement programs, practices and policies for both worksite wellness and occupational safety and health
(8) Operation managers are trained to ensure employee health through coordination with and support for occupational safety and health and worksite wellness
(9) Job descriptions for staff responsible for worksite wellness and occupational health and safety include roles and responsibilities that require interdepartmental collaboration and coordination of worksite wellness and occupational safety and health programs, policies, and practices
(10) Performance metrics for those responsible for worksite wellness and occupational safety and health include success with interdepartmental collaboration and coordination of worksite wellness and occupational safety and health programs, policies, and practices
(11) Professional development strategies include training and setting goals at performance reviews related to interdepartmental collaboration and coordination of worksite wellness and occupational safety and health programs, policies, and practices
(12) Worksite wellness and occupational safety and health vendors have the experience and expertise to coordinate with and/or deliver approaches that support the coordination and collaboration of workplace wellness and occupational safety and health efforts
(13) Both managers and employees are engaged in decision-making about priorities for coordinated worksite wellness and occupational safety and health programs, policies, and practices
(14) Joint worker-management committees addressing worker and worksite health reflect both worksite wellness and occupational safety and health.
(15) Incentives are offered to employees to complete activities to stay healthy (e.g. attend a training on health/safety), reduce their high risk behavior (e.g. quit smoking), and/or practice healthy lifestyles (e.g. gym membership discounts)
(16) Incentives are offered to managers who protect and promote health (e.g. accomplish health and safety in their departments and encourage reporting of hazards, illnesses, and injuries, and near misses; lead and encourage their employees in health promotion and protection efforts)
(17) Workplace benefits exist that address health, safety, and well-being (e.g. health care coverage, flex-time, paid sick leave, screening and prevention coverage, wellness opportunities)
(18) The effects of worksite wellness and occupational safety and health programs are monitored jointly
(19) Data related to employee health outcomes are integrated within a coordinated system
(20) High-level indicator reports (e.g., “dashboards”) on integrated programs are presented to upper level management on a regular basis, while protecting employee confidentiality
(21) The content of educational programs, such as classes, online courses or webinars, or toolbox talks, addresses potential additive or synergistic risks posed by exposures on the job and risk-related behaviors
(22) The content of educational programs, such as classes, online courses or webinars, or toolbox talks, acknowledges the impact of job experiences and the work environment on successful health behavior change

<sup>1</sup> Question response categories: Absent, Partially Adopted, Fully Achieved

**Table 2.**

Descriptive Organizational Characteristics from a Management Survey of Smaller Enterprises, September 2013-March 2014 (N=114)

Organizational Characteristic	Percent (N)
Number of employees (size)	
under 100	43.0 % (N=49)
100–199	33.3 % (N=38)
200+	23.7 % (N=27)
Occupational class category	
White-Collar	45.6% (N=52)
Service	24.6% (N=28)
Blue-Collar	29.8% (N=34)
Occupational Safety and Health (OSH) Leadership	79.8% (N=91)
OSH Staff	63.2% (N=72)
OSH Budget	35.1% (N=40)
OSH Committee	62.3% (N=71)
Worksite Health Promotion (WHP) Leadership	64.0% (N=73)
WHP Staff	34.0% (N=41)
WHP Budget	25.4% (N=29)
WHP Committee	30.7% (N=35)

**Table 3.**

Associations between Indicators of Integration Score and Organizational Characteristics from a Management Survey of Smaller Enterprises, September 2013-March 2014 (N=114)

Variable	Observations (N)	Mean & SD of Integration Score within category	Significance Value
Integration summary score	114	13.6 (9.6)	
Occupational class category			
White-Collar	52	12.4 (8.8)	0.10 <sup>1</sup>
Service	28	12.1 (9.1)	
Blue-Collar	34	16.6 (10.9)	
Number of employees			
under 100	49	12.4 (9.8)	0.06 <sup>2</sup>
100–199	38	13.2 (9.8)	
200+	27	16.3 (8.8)	
Occupational Safety and Health (OSH) leadership support			
No	23	7.3 (6.6)	0.0003 <sup>3</sup>
Yes	91	15.2 (9.6)	
Dedicated staff person responsible for OSH			
No	42	9.7 (8.8)	0.001 <sup>3</sup>
Yes	72	15.9 (9.4)	
Dedicated budget for OSH			
No	74	11.2 (8.9)	0.0002 <sup>3</sup>
Yes	40	18.1 (9.5)	
Worksite has OSH committee			
No	43	9.3 (7.6)	0.0001 <sup>3</sup>
Yes	71	16.2 (9.8)	
Worksite Health Promotion (WHP) Leadership			
No	41	9.6 (7.4)	0.001 <sup>3</sup>
Yes	73	15.9 (10.0)	
Dedicated staff person responsible for wellness			
No	73	11.3 (8.8)	0.001 <sup>3</sup>
Yes	41	17.7 (9.8)	
Dedicated budget for worksite wellness			
No	85	11.7 (9.0)	0.0002 <sup>3</sup>
Yes	29	19.2 (9.5)	
Worksite has worksite wellness committee			
No	79	12.2 (9.4)	0.02 <sup>3</sup>

Variable	Observations (N)	Mean & SD of Integration Score within category	Significance Value
Yes	35	16.7 (9.5)	

<sup>1.</sup> Prob > F from ANOVA, F=2.39.

<sup>2.</sup> Spearman Rank Correlation, rho=0.18.

<sup>3.</sup> P-value from t-test

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**Table 4.**

Linear Regression of Organizational Characteristics on Integration Score from a Management Survey of Smaller Enterprises, September 2013-March 2014 (N=114)

Variable	Coefficient	95% Confidence Interval
Number of employees (size)		
under 100	reference	
100–199	–0.84	[–4.39,2.71]
200+	1.27	[–2.80,5.33]
Occupational class category		
White-Collar	reference	
Service	–1.06	[–4.49,2.36]
Blue-Collar	2.87	[–1.51,7.26]
Occupational Safety and Health (OSH) Leadership <sup>I</sup>	1.27	[–1.55,4.09]
Dedicated staff person responsible for OSH <sup>I</sup>	2.17	[–1.48,5.82]
Dedicated budget for OSH <sup>I</sup>	2.75	[–1.45,6.94]
Worksite has OSH committee <sup>I</sup>	4.02 *	[0.56,7.50]
Worksite Health Promotion (WHP) Leadership <sup>I</sup>	5.62 **	[1.90,9.34]
Dedicated staff person responsible for wellness <sup>I</sup>	1.16	[–2.88,5.20]
Dedicated budget for worksite wellness <sup>I</sup>	3.67	[–0.58,7.92]
Worksite has worksite wellness committee <sup>I</sup>	–1.19	[–5.14,2.75]

Notes:

\*  
p<0.05

\*\*  
p<0.01

The model included a constant term

<sup>I</sup> Binary variable with response categories yes=1, no=0