# Validation of a New Metric for Assessing the Integration of Health Protection and Health Promotion in a Sample of Small- and Medium-Sized Employer Groups

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**Objective:** To conduct validation analyses for a new measure of the integration of worksite health protection and health promotion approaches developed in earlier research. **Methods:** A survey of small- to medium-sized employers located in the United States was conducted between October 2013 and March 2014 (n = 111). Cronbach α coefficient was used to assess reliability, and Pearson correlation coefficients were used to assess convergent validity. **Results:** The integration score was positively associated with the measures of occupational safety and health and health promotion activities/policies—supporting its convergent validity (Pearson correlation coefficients of 0.32 to 0.47). Cronbach α coefficient was 0.94, indicating excellent reliability. **Conclusions:** The integration score seems to be a promising tool for assessing integration of health promotion and health protection. Further work is needed to test its dimensionality and validate its use in other samples.

The prospect that using an integrated approach to protection and promotion of worker health could improve worker health and well-being and prevent injury and illness is the primary motivation for the National Institute for Occupational Safety and Health's Total Worker Health™ initiative.[1–3] Sorensen et al[4] define an integrated approach as a "strategic and operational coordination of policies, programs and practices designed to simultaneously prevent work-related injuries and illnesses and enhance overall workforce health and well-being." The evaluation of this approach necessitates the assessment of both occupational safety and health (health protection) and health promotion programs, practices, and policies, as well as the level of integration.

Although many studies have endeavored to measure the effectiveness of specific occupational safety and health interventions and health promotion programs separately, very few measure these efforts concurrently.[5–8] Even less work has attempted to measure integration directly, especially within small- to medium-sized businesses. One study that used a random sample of Massachusetts employers found that 28% of respondents reported coordinating occupational safety and health and health promotion efforts (always or often).[9] Nevertheless, as the authors noted, it was unclear how respondents might have understood the extent of coordination.[9]

Although definitions of integration have been specified in the literature and several studies have begun to test integrated approaches, no common practical measure of integration has been validated, particularly for small- to medium-sized businesses.[4] A validated measure of integration would improve dialogue among researchers, facilitate the research-to-practice process, and define the optimal best practice.[4] This study uses a measure of integration of health protection and health promotion developed in earlier work and assesses its reliability and convergent validity in a sample of small- to medium-sized firms (<750 employees).[4] The vast majority of firms in the United States have fewer than 750 employees, and these firms are also less likely to provide certain benefits to their employees—increasing the value of a tool to measure integration.[7,10] As described in Sorensen et al,[4] the measure was created using a modified Delphi process.

In this article, we evaluate the new measure's internal consistency and its convergent validity with respect to measures of the extent and capacity of health protection and health promotion. The number of activities/programs and policies (such as a way for employees to report safety issues or a written no smoking policy) is calculated separately for health protection and health promotion. Capacity is measured with questions on whether the firm had a dedicated budget, a dedicated staff person, and a committee, calculated separately for health protection and health promotion. We hypothesize that (1) organizations with more extensive health protection and health promotion programming would have higher integration scores, and (2) organizations with higher health protection capacity and health promotion capacity would have higher integration scores.

## METHODS

### Study Design

The web-based survey of small- to medium-sized employers (<750 employees) used in this study was conducted between September 2013 and March 2014. The survey took participants approximately 15 minutes to complete, and respondents were offered a $25 Amazon gift card as a participation incentive. Lists of human resource directors/managers obtained from an insurance brokerage firm in Minnesota and the Minnesota Chamber of Commerce comprised the survey sample of respondents. The survey was given to 400 small- and medium-sized businesses with up to three additional electronic and phone attempts to reach nonrespondents; subsequently surveys were sent in the mail to the nonrespondents one time. Detailed information on the design and conduct of the survey can be found in McLellan et al.[11] Approval was obtained from the Institutional Review Board at the Harvard T. H. Chan School of Public Health.

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## QUANTITATIVE VARIABLES

### Integration of Health Protection and Health Promotion

The measure of integration of health protection and health promotion has several domains as described by Sorensen et al.[4] These domains include both theoretically and practically relevant aspects of integration: organizational leadership and commitment; coordination of worksite efforts to protect and promote worker health, safety, and well-being; supportive organizational policies and practices; accountability and training; ''management and employee engagement''; benefits and incentives to support health protection and health promotion; integrated evaluation and surveillance; and comprehensive program content. The full measure of integration is available in Table 1 and Sorensen et al.[4] One question from the original measure, whether workers are actively engaged in planning and implementing health promotion and occupational safety and health programs and policies, was inadvertently omitted from the survey. Additional questions on the survey not related to the measure of integration were informed by qualitative interviews with HR directors and safety managers and adapted from prior surveys conducted to determine the characteristics of health protection and health promotion programs, including the Massachusetts Department of Public Health survey, the 2004 National Worksite Health Promotion Survey, and an adaptation of an Occupational Safety and Health Administration 1995 Program Evaluation Profile used in previous work.[4,9,12–14]

### Number of Activities/Policies

The number of health protection activities/policies is measured by summing responses to the following questions about the following topics: existence of system/program, updated on regular basis, written statement, management sets goals, managers/supervisors directly accountable, way for employees to report safety issues, feedback to employees who report, hourly employees provided with training, orientation process, and training for supervisors. The number of health promotion programs/policies is measured by summing responses to questions that addressed the following topics: written policies for no smoking, alcohol, drugs, employee counseling, seat belt use at work, prohibiting firearms at work, fitness breaks, and healthy food options; programs for health screenings, health risk assessment, physical activity, on-site education, individual coaching, and whether an employee assistance program exists; and environment including existence of a cafeteria, labeling food items for healthy choices, vending machines, special promotions to encourage health food choices, and on-site showers.

### Capacity

Capacity for health promotion is measured with questions on whether the firm had a dedicated budget, a dedicated staff person, and a committee for health promotion. These measures have been used in previous work.[11,15] An analogous set of questions is used to measure capacity for health protection because there were no existing measures for assessing capacity for health protection.

### Statistical Methods

To develop a numeric score for the measure of integration, the answers to each question in the measure are coded so that higher numerical scores indicate greater integration between health protection and health promotion. Answers of ''absent'' are scored as 0, answers of ''partially adopted'' are scored as 1, and answers of ''fully adopted'' are scored as 2. Adding together the response for each question in the measure yields a theoretical range of 0 to 44 and will hereafter be referred to as the integration score.

In these analyses we consider the integration score as having a single dimension and therefore characterize its reliability, or internal consistency, with Cronbach $\alpha$ coefficient for all questions on the survey. Convergent validity is assessed by associations between the integration score and concepts hypothesized to be associated with it. These include the number of health protection activities and policies, the number of health promotion activities and policies, and the health protection and health promotion capacity (ie, committee, budget, dedicated staff for health protection, and health promotion). The numbers of programs/policies and the measure of capacity are each the sums of the relevant items. We use Pearson correlation coefficients to characterize these associations, with Bonferroni corrections to account for multiple comparisons. All analyses were conducted using STATA 13.1 (StataCorp, College Station, TX).[16]

## RESULTS

### Participants

The survey was distributed to 400 companies. The total response rate was 117 of the 400 or 29%, but, after excluding respondents who did not answer the questions about integration, our final number of observations was 111. The average number of employees at enterprises used in the analysis was 163 (standard deviation [SD], 149; range 7 to 735). Companies were in industries such as professional, scientific, and technical services, health care and social assistance, manufacturing, among many others. Full details are available in McLellan et al.[11]

### Descriptive Statistics

Survey respondents were asked whether the measures of integration were absent, partially adopted, or fully adopted in their organization. Question text and summary statistics for these responses are given in Table 1. The indicator of integration with the least implementation was for ''incentives are offered to managers who protect and promote health,'' and the indicator with highest level of full implementation was ''the content of education programs. .. acknowledges the impact of job experiences.''

Figure 1 shows the distribution of the integration score. There was a large range of actual scores, with most of the sample falling below half of the theoretical range. The average score in the sample was 13.66, with an SD of 9.59.

The average number of health protection programs and policies was 8.16 (SD, 2.46) in the sample. The average number of health promotion programs/policies in the sample was 9.15 (SD, 2.99). The number of health promotion programs/policies ranged from 3 to 18 in the sample. The average capacity of health protection was 1.64 (SD 1.03) and health promotion was 0.93 (SD, 1.16).

### Main Results: Reliability and Convergent Validity

Cronbach $\alpha$ for the integration score was 0.94. The average interitem correlations ranged from 0.17 to 0.19. The Pearson correlation coefficients for the integration score and the number of occupational safety and health and health promotion programs/policies are given in Table 2. The integration score was positively correlated with the numbers of programs and policies for both health protection and health promotion; the correlation coefficients were 0.40 and 0.45, respectively. The parallel results for Pearson correlation coefficients between the integration score and the measured health protection and health promotion capacities are given in Table 3. The indicator of the integration score was positively correlated with both measures; the correlation coefficient was 0.47 with respect to health protection capacity and it was 0.32 with respect to health promotion capacity.

**TABLE 1.** Responses to Questions[1] about the Extent of Integration Between Health Protection and Health Promotion Programs/Policies Among Participants ($n = 111$)*

| Question Construct | Percentage[2] | | |
|---|---|---|---|
| | Absent, % | Partially Adopted, % | Fully Achieved, % |
| Organizational leadership and commitment | | | |
| (1) Top management expresses its commitment to a culture of health and environment that supports employee health | 17.1 | 69.4 | 13.5 |
| (2) Both worker and worksite health are included as part of the organization's mission | 57.7 | 31.5 | 10.8 |
| (3) Senior leadership allocates adequate human and fiscal resources to implement programs to promote and protect worker health | 33.3 | 51.4 | 15.3 |
| Coordination between health protection and promotion | | | |
| (4) Decision making about policies, programs, and practices related to worker health is coordinated across departments, including those responsible for occupational safety and health and those responsible for worksite wellness | 28.8 | 56.8 | 14.4 |
| (5) Processes are in place to coordinate and leverage interdepartmental budgets allocated toward both worksite wellness and occupational safety and health | 58.6 | 34.2 | 7.2 |
| (6) Efforts to promote and protect worker health include both policies about the work organization and environment and education and programs for individual workers | 33.3 | 47.8 | 18.9 |
| Processes for accountability and training | | | |
| (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 | 43.2 | 46.9 | 9.9 |
| (8) Operation managers are trained to ensure employee health through coordination with and support for occupational safety and health and worksite wellness | 44.1 | 39.6 | 16.2 |
| (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 | 56.8 | 27.9 | 15.3 |
| (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 | 64.0 | 32.4 | 3.6 |
| (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 | 63.1 | 34.2 | 2.7 |
| (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 | 45.1 | 38.7 | 16.2 |
| Coordinated management and employee engagement strategies | | | |
| (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 | 39.6 | 46.0 | 14.4 |
| (14) Joint worker-management committees addressing worker and worksite health reflect both worksite wellness and occupational safety and health | 48.7 | 38.7 | 12.6 |
| Benefits and incentives to support workplace health promotion and protection | | | |
| (15) Incentives are offered to employees to complete activities to stay healthy (eg, attend a training on health/safety), reduce their high-risk behavior (eg, quit smoking), and/or practice healthy lifestyles (eg, gym membership discounts) | 46.9 | 33.3 | 19.8 |
| (16) Incentives are offered to managers who protect and promote health (eg, 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) | 84.7 | 10.8 | 4.5 |
| (17) Workplace benefits exist that address health, safety, and well-being (eg, health care coverage, flex-time, paid sick leave, screening and prevention coverage, wellness opportunities) | 17.1 | 45.1 | 37.8 |
| Integrated evaluation and surveillance | | | |
| (18) Effects of worksite wellness and occupational safety and health programs are monitored jointly | 57.7 | 36.9 | 5.4 |
| (19) Data related to employee health outcomes are integrated within a coordinated system | 76.6 | 18.0 | 5.4 |
| (20) High-level indicator reports (eg, "dashboards") on integrated programs are presented to upper-level management on a regular basis, while protecting employee confidentiality | 74.8 | 18.9 | 6.3 |

**TABLE 1.** (*Continued*)

| Question Construct | Percentage[2] | | |
|---|---|---|---|
| | Absent, % | Partially Adopted, % | Fully Achieved, % |
| Comprehensive program content | | | |
| (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 | 57.7 | 32.4 | 9.9 |
| (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 | 54.1 | 37.8 | 8.1 |

**Totals may not sum to exactly 100% because of rounding. This table contains the frequencies of response to questions measuring the level and dimensions of the integration between occupational safety and health programs and policies and health promotion programs and policies. This web-based survey of small- to medium-sized employers (<750 employees) was conducted between September 2013 and March 2014.

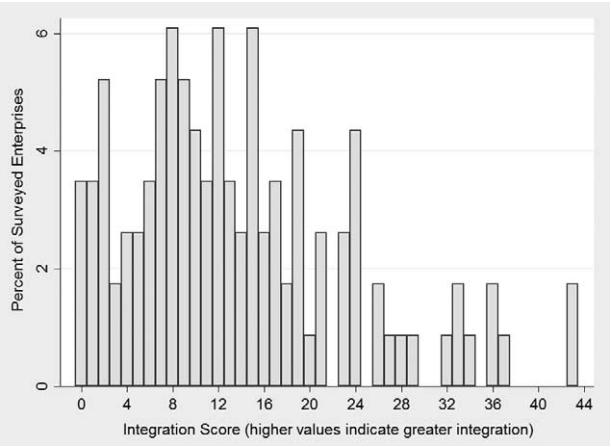


**FIGURE 1.** Response distribution for integration score ($n = 111$). *Notes*: The index was calculated as the sum of responses for relevant questions with absent = 0, partially achieved = 1, and fully achieved = 2. The index's theoretical range is 0 to 44.

## DISCUSSION

These analyses illustrate the reliability and convergent validity of a set of questions designed to measure the integration of health protection and health promotion programs and policies, the integration score, in a sample of small- to medium-sized employers. The Cronbach α was high—indicating internal reliability and that might be possible to reduce the measure's length while maintaining internal reliability.[17] The Pearson correlation coefficients indicated moderate correlation between related concepts and were statistically significant at the 5% level, as expected. The range of integration scores indicates considerable variation in adoption of integrated approaches as well as the potential for greater integration even among high-scoring organizations. The variation found in this sample of small- and medium-sized employers provides evidence that integration occurs in a variety of ways that differ across organizations.

Being able to measure the integration of health protection and health promotion programs accurately and succinctly will improve future research seeking to validate the concepts underlying Total Worker Health™. The underlying motivation for studying the integration of health protection and health promotion is driven by suggestive evidence that integrated programs are more effective and have higher participation rates.[13,18–22]

**TABLE 2.** Pearson Correlation Coefficients[1] for Integration Score, Number of Health Protection Programs/Policies, and Number of Health Promotion Programs/Policies*

| | Integration Score | Number of Health Protection Programs/ Policies | Number of Health Promotion Programs/ Policies |
|---|---|---|---|
| Integration score | 1 | | |
| Number of health protection programs/policies | 0.40† | 1 | |
| Number of health promotion programs/policies | 0.45† | 0.10 | 1 |

*Bonferroni correction for multiple comparisons.
†Indicates significance at the 1% level.

Accurate and practical measurement of the concept of integration will allow a standardized definition of integration, as well as increase the feasibility multiemployers surveys. Using a score with separate items for potential areas of integration will allow future analyses of the components of integration as well as the variability in the extent of integration. Because of its ease of administration, the indicator of integration measure is a practical assessment tool to use for organizations that desire to assess or track progress toward

**TABLE 3.** Pearson Correlation Coefficients for Integration Score, Health Protection Capacity, and Health promotion Capacity*

| | Integration Score | Health Protection Capacity | Health Promotion Capacity |
|---|---|---|---|
| Integration score | 1 | | |
| Health protection capacity | 0.47† | 1 | |
| Health promotion capacity | 0.32† | 0.20 | 1 |

*Bonferroni correction for multiple comparisons.
†Indicates significance at the 1% level.

the integration of health protection and health promotion programs and policies. A useful feature of the measure is that it may be administered by interview or in a written format. The index questions themselves may suggest to organizations potential changes that would lead to greater use of integrated approaches. Examining the extent to which organizations use the indicators of integration to guide the development of programs and policies would be a beneficial avenue of future work.

The sample's limited geography is the major limitation of these analyses. It is possible that the convergent validity and reliability properties of the index might vary in other samples. Because of limitations in the scope of the survey, no analyses were possible to determine the discriminant validity of the measure.

From the research perspective, these analyses are a useful first step that will inform future research on integrated approaches by allowing for standardized measurement of integration. Ongoing qualitative research will add depth to our understanding of how integrated programs and policies are viewed by small- to medium-sized businesses and how interventions to increase integration are engaged. Additional work to test the measure in larger samples and other geographic regions will increase the scale's applicability to measure integration in different contexts.

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