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Integrated Worker Health Protection and Promotion Programs: Overview and Perspectives on Health and Economic Outcomes

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Abstract

Objective—To describe integrated worker health protection and promotion (IWHPP) program characteristics, to discuss the rationale for integration of OSH and WHP programs, and to summarize what is known about the impact of these programs on health and economic outcomes.

Methods—A descriptive assessment of the current state of the IWHPP field and a review of studies on the effectiveness of IWHPP programs on health and economic outcomes.

Results—Sufficient evidence of effectiveness was found for IWHPP programs when health outcomes are considered. Impact on productivity-related outcomes is considered promising, but inconclusive, whereas insufficient evidence was found for health care expenditures.

Conclusions—Existing evidence supports an integrated approach in terms of health outcomes but will benefit significantly from research designed to support the business case for employers of various company sizes and industry types.

Introduction

In 2004, as part of its “WorkLife” program, the National Institute for Occupational Safety and Health (NIOSH) sponsored the *Steps to a Healthier U.S. Workforce* symposium. The symposium connected professionals from the occupational safety and health (OSH) and worksite health promotion (WHP) communities with the intention to facilitate progress towards a research, practice, and policy agenda related to integrated worker health protection and health promotion (IWHPP). Growing interest in coordinated efforts towards protection and promotion of health and well-being at the worksite has led to the recent introduction of the NIOSH Total Worker Health™ Program (TWH) (1).

Efforts to integrate OSH and WHP (IWHPP) programs are designed to avoid worker illness, injury, and disability and to promote health, function, and wellbeing. Functions traditionally considered to be under the auspices of OSH include activities such as compliance with

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Occupational Safety and Health Administration (OSHA) regulations, safety trainings, ergonomics, blood-borne pathogens, and radiation safety, among others. The focus of WHP has typically been on improving the health of workers through individual behavior change and group-based activities, although more recent efforts have focused on changes in organizational policies that reduce exposures to risks in the physical or psychosocial environment (2, 3). IWHPP initiatives create multi-disciplinary approaches that operate at multiple levels at the workplace, including the individual-, group-, organizational- and environmental-level. In the context of legal, social, political, and economic factors, IWHPP programs present opportunities for collaboration, integration, and synergy among multiple stakeholders (2).

It may be assumed that integrated solutions are more effective than separate efforts to protect and promote health among workers (4). Evidence to support this assertion is needed and hence, the purpose of this paper is to briefly describe IWHPP program characteristics and place them in context, to discuss the rationale for integration of OSH and WHP programs, to summarize what is known about the impact of these programs on health and economic outcomes, and to offer perspective on the state of current knowledge of this emerging field.

Describing and Defining Integrated Worker Health Protection and Promotion

Several conceptual frameworks and descriptive presentations of IWHPP efforts exist in the literature. An early description of an integrated health and safety model compared and contrasted the health promotion and occupational safety and health fields and proposed a model featuring three interactive systems—job demands and worker characteristics, work environment, and extra organizational influences. This model explicitly recognized the need to address environmental factors in protecting and promoting worker health (5). As a result of the 2010 *Towards Better Work and Well-being* conference, sponsored by the Finnish Institute of Occupational Health, well-being at work was conceptualized as the interaction among a variety of factors and their relationships to productivity of workers, companies, and the nation as a whole. The critical factors identified in well-being included socioeconomic status, workplace factors, environmental factors, occupational hazards, health, and host and demographic factors (6). The proceedings of a National Institutes of Health and Centers for Disease Control and Prevention chronic disease prevention workshop describe IWHPP as including the intervention targets of work environment (physical, organizational, and psychological), individual health-related behaviors, and the work-family-community interface in the context of legal, social, political, and economic factors that give rise to opportunities for collaboration, synergy, and integration (2). The American College of Occupational and Environmental Medicine (ACOEM) describes components of workplace health protection and promotion programs to include efforts that are strategic, integrated, systematic, and that bring together environmental and safety policies and programs that prevent work-related injuries and illnesses along with activities that enhance the overall health and wellbeing of the workforce (7). The fusion of worker health protection and promotion was also described by the International Association for Worksite Health

Promotion (IAWHP) as a coordinated and comprehensive approach that includes programs and policies that address the physical and organizational work environment and promotes personal health among individual workers and their families. This description recognizes multi-level interventions and the roles that leadership, management, and individual employees play in the context of a corporate culture and the broader community (8, 9). The World Health Organization introduced a global plan of action for worker health in 2007 (10). The framework considers the worksite to be a primary setting for the protection and promotion of health among workers, their families, and the community. It presents an integrated approach to planning, delivery, and evaluation of programs organized around principles of business ethics, a strong business case, and a strong legal case. Finally, NIOSH defines TWH as “a strategy integrating occupational safety and health protection with health promotion to prevent worker injury and illness and to advance health and well-being” (1). This program explicitly recognizes that health and well-being of workers is a shared objective by workers, their families, and employers and is impacted by the work environment and non-work activities.

In an effort to summarize the various descriptions of IWHPP programs, Figure 1 depicts key words, elements, factors, and characteristics as referred to by these sources into a single illustration that may support the creation of a clear and concise definition of IWHPP programs. The figure is not intended to distill the multiple factors presented down to a small set of basic elements. Rather, the intent is to recognize that many factors need to be considered, many factors interact or are affected by others, and thoughtful consideration of how these factors inter-relate and are dependent on each other will likely provide insight in how to conceptualize and define IWHPP approaches. The emerging field of integrated worker health protection and promotion will benefit greatly from a clear and concise, yet open, broad and robust definition; one that will be sufficiently flexible to stimulate innovations and growth.

Why Integrate?

A comprehensive approach to worker health based on multi-disciplinary, multi-level, and integrated methods has been advocated in the literature since the late 1980’s (5, 11–18). A rationale to support the promotion of integrated programs may cite several reasons.

First, the simultaneous reduction of accidents or injuries and improvement of the health status of the workforce is perhaps the most obvious reason. The idea that an integrated approach can achieve both objectives more efficiently is appealing and makes common sense. Leveraging already available resources (such as safety-related resources and processes to further health promoting objectives) may also be considered good resource stewardship (1, 7, 18).

Second, workers’ risk of disease is increased by exposure to both occupational hazards and risk-related behaviors. For example, tobacco smoke contains toxic agents (e.g., benzene) that may also be present in certain workplace environments. Workers who smoke may be doubly exposed to these agents due to their exposure to workplace hazards. These exposures

may act synergistically when effects go beyond the addition of the two exposures alone, such as in the case of tobacco smoke and asbestos (19, 20).

Third, workers at highest risk for exposure to hazardous working conditions are also those most likely to engage in higher risk behaviors or have recognized health risk factors such as obesity or hypertension. Working-class occupations tend to have more job risk exposures and are more likely to become injured or ill due to workplace hazards as compared to professional employees (21–29).

Fourth, integrating OSH and WHP may increase participation, engagement, and success rates (effectiveness) for high-risk workers. The fact that people often place highest priority on those risks that are outside their personal control, are undetectable, and seemingly unfair (30–32) (features associated with job hazards), may lead workers to perceive that reduction of occupational hazards is more important than personal health behavior changes (33). Skepticism about an organizational commitment to protect worker health may reduce employee participation in WHP programs (13, 34, 35). Conversely, employer efforts to create a corporate culture of trust and respect may enhance workers' receptivity and openness to messages and programs designed to change behaviors and improve health (36, 37).

Lastly, integrating OSH and WHP may benefit the larger organization through cost reductions or cost savings. Positive economic outcomes cannot be generated without intervention effectiveness. A systematic review by the Task Force on Community Preventive Services noted strong evidence of effectiveness for assessments of health risk with feedback plus follow-up interventions (38). Despite some studies reporting mixed results (39) or expressing cautious optimism for achieving positive return on investment (40), evidence of positive economic impact of OSH interventions (41, 42) and WHP programs (43–45) separately is supported by a growing literature. However, evidence of cost savings as a result of IWHPP programs is only slowly emerging (4, 46).

Evidence of Effectiveness for Integrated Worker Health Protection and Promotion Programs

IWHPP programs are those that integrate OSH and WHP components, not those that look at either one or the other. To summarize current knowledge, a literature search (Pub Med database; http://www.ncbi.nlm.nih.gov/pubmed) was conducted to identify reports on IWHPP programs by using key words and search strings that were based on the results depicted in Figure 1. Results were complemented by references identified from previously conducted reviews and committee reports. The health outcomes were conceptualized as both changes in health behaviors and health risk factors as well as the impact of preventive efforts on injury and illness reduction. Economic outcomes were conceptualized as both changes in productivity losses, i.e., reductions in absenteeism- and presenteeism-related factors, as well as changes in health care expenditures. Identified IWHPP program reports were grouped according to the following categories: studies reporting on experimental trial results of interventions among workers, existing reviews or committee reports on IWHPP, and case study examples of intervention results specific to the experience of a single employer.

Experimental Studies

Eleven experimental studies were identified in the literature that included intervention and control or comparison groups and that provide direct evidence on the impact of integrated worker health programs on health-related outcomes and economic indicators. These studies are presented in Table 1 and include randomized controlled trials and quasi-experimental studies in a variety of workplaces and job types ranging from call centers to construction laborers. Studies included interventions related to tobacco, nutrition, physical activity, and weight loss from a health promotion perspective and office ergonomics, work organization, employee trainings from a health protection perspective.

Across the 11 studies listed, all reported improvements in health-related outcomes. From an experimental design perspective, 7 of the 11 studies were randomized controlled trials (46, 48–52, 54) and they all showed results in a similar, positive direction. Furthermore, the health outcomes tended to be supported by well-accepted, yet varied, measurement methodologies.

Economic outcomes in terms of productivity-related impact were reported by 5 of the 11 studies (46, 47, 54–56). The randomized controlled trials (46, 54) and one quasi-experimental study (47) monitored productivity indicators directly using company records and monitoring systems. The remaining two quasi-experimental reports represented pilot investigations with a relatively small numbers of study subjects (55, 56). One study (56) reported productivity improvements whereas the other (55) did not.

Only one study reported on health care expenditures and found no significant effect (46). This study, a randomized controlled trial, measured health care expenditures through monitoring logs based on self-report (46).

One additional observation of interest was reported by Sorensen and colleagues in the WellWorks-2 Trial (49). Results of this study indicated improvement in health promotion program participation. Additional process evaluations have corroborated these findings (50, 57, 58).

Several studies reviewed relate to interventions in the area of ergonomics where sit-stand devices are introduced into the work environment, thereby changing work organization and components of the physical and psychosocial environments (54–56). These studies recognize the contextual impact on psychosocial variables in the workplace and relationships to behavioral variables, specifically physical activity or sedentary behavior (59, 60). As such, they integrate ergonomics with behavior change programs into an IWHPP-type application and look for effects on health and productivity-related outcomes. The three studies included in this review represent an innovative and emerging area of research.

Based on a review of experimental studies of IWHPP programs, it may be concluded that additional sufficiently powered randomized trials are needed. A consistent observation was the impact on health-related outcomes, but gaps remain related to economic outcomes.

Reviews or Committee Reports

In addition to a review of experimental studies, review papers and committee reports were identified that specifically addressed IWHPP programs. Identified reports are presented in Table 2 and include 7 literature reviews and 4 committee reports that discuss health or economic outcomes. Included are systematic reviews (64, 65, 67) and more general reviews of the literature (61–63, 66), an in-depth report from the Institute of Medicine (18), and seminal research papers for the NIOSH TWH (4, 17, 68).

In general, these reports communicate agreement that IWHPP programs generate positive health outcomes. The IOM Committee to Assess Worksite Preventive Health Program Needs for NASA Employees presented its recommendations for program evolution at NASA and concluded that sufficient evidence of effectiveness supports the promotion of integrated worker health programs (18). However, their recommendations were based on health outcomes only and did not include economic considerations.

Several reports presented positive economic outcomes in terms of productivity indicators (17, 62, 65–68). Few reports included economic outcomes in terms of health care expenditures and those that did based their findings mostly on separate OSH or WHP study results (66–68). When the literature was considered in the context of a proposed conceptual model, the evidence base was considered limited for both health and economic outcomes (61).

In summary, review papers and committee reports identified indicate mostly positive health-related outcomes. Some evidence suggests positive economic outcomes, mostly limited to productivity loss reduction, although this evidence appears limited to separate OSH or WHP program evaluations. Hence, the economic outcomes may be summarized as promising, but inconclusive evidence of effectiveness. A need exists for additional research specifically focused on the economic impact of IWHPP programs.

Single Employer Case Examples

To support a business case for IWHPP programs, the business community often looks at examples in practice that present a proof of concept. These examples are often referred to “case examples” or “case studies” and may be helpful to illustrate what is possible and what processes need to be considered for successful adoption in the workplace setting. Several employer-specific case examples are presented in Table 3 (18, 69–77). It should be noted that this presentation of case examples does not constitute an exhaustive list, but provides benchmarks and best practice examples in support of the characteristics identified in Figure 1. The case examples presented are generally well-recognized in the industry as large, progressive organizations that tend to have a history of moving towards integrated solutions that optimize impact and efficiency.

In summary, the case examples report positive health-related and economic outcomes of IWHPP programs. All tend to have strategic measurement approaches in place that allow for ongoing, long-term reporting on key outcomes and integrate their efforts into management systems. Generally speaking, these best practice examples report outcomes that justify more

focused research in the underlying factors and causal pathways for the impact of IWHPP approaches to improve health, reduce costs, and optimize performance at work.

Perspectives on Current Knowledge

Based on a review of experimental studies, review papers, committee reports, and best practice examples, it is concluded that sufficient evidence exists in the literature to support the contention that IWHPP programs generate improvements in worker health status. Although emerging evidence indicates that IWHPP programs may generate positive productivity outcomes, the evidence base for health care cost reduction is considered insufficient.

The best practice examples presented in Table 3 recognize a relatively rich “practice-based evidence” foundation. However, since an obvious publication bias regarding positive case examples exists, there is a need to interpret these examples with caution. A strong business case may justify the investment into IWHPP initiatives by employers (78). Legal, financial, and moral reasons represent the major drivers in decision-making to invest and implement programs (79). On the OSH side, legal considerations tend to be the driving force behind the decision to implement since achievement of minimal OSH standards are a regulatory requirement for companies. On the WHP side, studies show associations with low occupational injury rates and occupational illness (e.g., asthma, cardiovascular disease) (46, 47, 49, 77, 80–83) and positive financial impact (45, 84), although controversy on financial impact remains (40, 85, 86). Since investment decisions for WHP are rarely prioritized based on legal or regulatory rationale, financial and moral reasons (e.g., 38, 87) tend to apply here.

Additional research on IWHPP initiatives has been proposed and recommended by others (2, 17). Based on the results of this report, emphasis should be placed on high quality studies designed to show the relationships between integrated programs and economic outcomes. Furthermore, attention needs to be paid to company size and industry type. Large employers tend to be well-represented in the research conducted to date. Although some examples exist (88, 89), small employers are represented less despite the fact that most workers find employment in smaller companies (89). Additionally, clear differences exist between the needs of companies and workers across various industries, such as manufacturing, construction, or health care. These differences range from the type of health problems most frequently encountered (e.g., low back pain vs. metabolic profiles, etc.), to the risk factors driving health issues, the prevalence of sickness absence, the work organization, and the benefits design for workers and their families, just to name a few (2).

Integration of efforts to protect and promote worker health is undoubtedly important. However, tools to measure integration remain elusive which creates challenges for implementation and management. A clear need exists to define, measure, evaluate, and validate integration methods. As stated earlier, integration is more than merely adding worker health protection and promotion efforts together; it reflects shared commitment, goals and objectives for worker health. Integration reflects strategic and operational activities that extend into deliberate and intentional interactions, partnerships, and inter-

dependencies of efforts to protect and promote worker health. Sorensen and colleagues present a discussion on defining and measuring an integrated approach to worker health and outline a set of seven indicators of integration considered along a continuum (90). Important next steps include the testing and refinement of the proposed measures, the consideration and recommendation of operational implications and guidance, and the dissemination of results to support organizational adoption.

In order to deliver on the promise of IWHPP programs, it will behoove all stakeholders involved to collaborate more vigorously towards the creation, adoption, implementation, and maintenance of such programs (91). The stakeholders include human resources, OSH, and WHP professionals, but the roles of others such as employee assistance providers, health plan administrators, onsite care delivery providers, and community-based partners, should be recognized as well. Whereas incentives such as health care cost containment, improved health and well-being, and reduced financial liability exist for IWHPP programs (91, 92), the lack of a compelling business case that justifies resource investment remains a significant challenge (93). Future research should address these concerns and base specific hypotheses on information gathered directly from the stakeholders using both qualitative and quantitative methods.

Conclusion

The integration of worker health protection and promotion efforts is an area of emerging importance. Existing evidence supports an integrated approach in terms of health outcomes but will benefit significantly from research designed to strengthen the business case for employers of various company sizes and industry types.

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Clinical Significance

Based on a review of the literature of integrated worker heath protection and promotion programs, existing evidence supports an integrated approach in terms of health outcomes but will benefit significantly from research designed to strengthen the business case for employers of various company sizes and industry types.

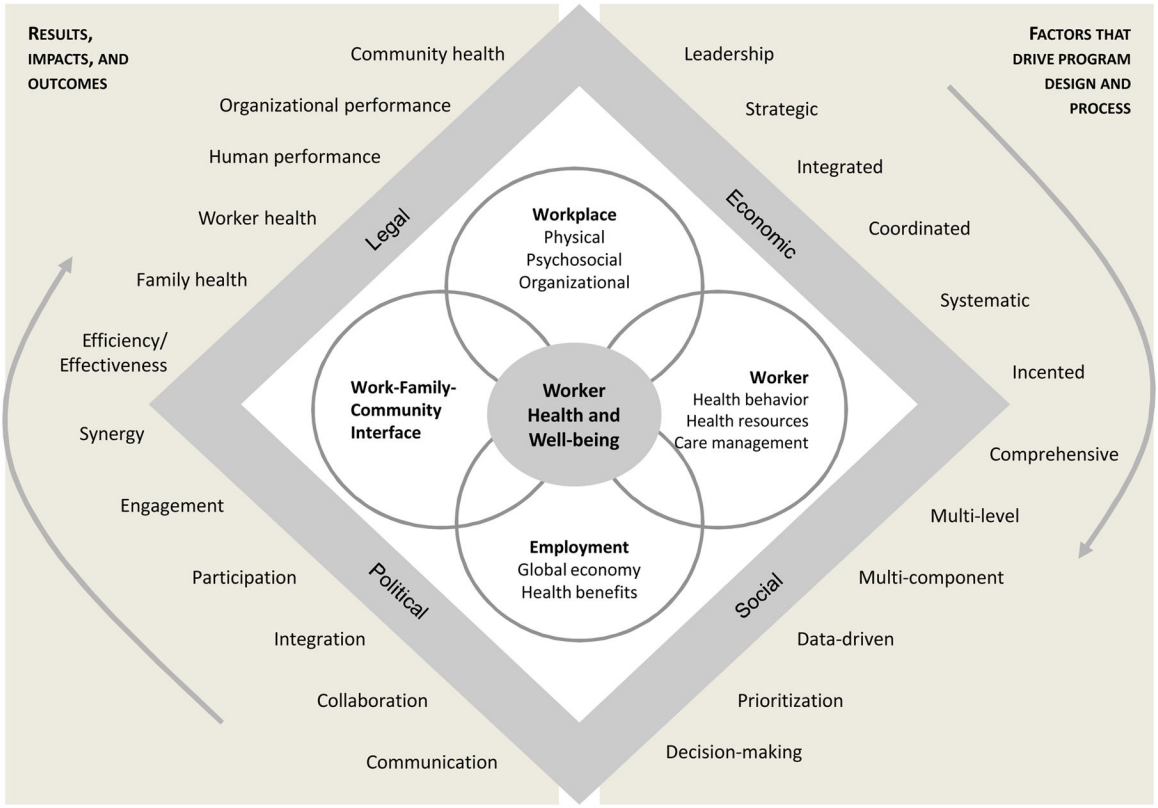

Figure 1.
Compilation of Key Words, Characteristics, and Factors of Integrated Worker Health Protection and Promotion Programs

Table 1

Experimental Studies on Integration of Worker Health Protection and Promotion Programs

			Economic Outcomes		
Study and Reference	**Design**	**Health Outcomes**	**Productivity Loss Reduction**	**Health Care Expenditures**	**Comment**
The Brabantia Project (47)	Quasi-experimental pre-post study with comparison sites	+	+	**NA**	Study to improve the health and wellness by means of lifestyle changes and changes in working conditions among Dutch workers (3 Brabantia sites) and measured through changes in behavior, health risks, stress reactions, quality of work performed, and absenteeism
WellWorks-1 (48)	RCT at the worksite level	+	**NA**	**NA**	Study on the effects of a 2-year integrated health promotion and health protection intervention on changes in dietary habits and smoking
WellWorks-2 (49)	RCT at the worksite level	+	**NA**	**NA**	Study on the effects of an integrated health promotion and health protection intervention on participation in health promotion programs as well as programs to reduce exposures to occupational hazards. This study also showed improvements in occupational safety outcomes
Healthy Directions/Small Business (50)	RCT at the worksite level	+	**NA**	**NA**	Multi-level study conducted in 24 small manufacturing worksites to study the health impact of an intervention on multiple health behaviors
Tools for Health (51)	RCT at the worksite level	+	**NA**	**NA**	Study among high-risk construction laborers to test a behavioral intervention to improve health behaviors (smoking and fruits and vegetables intake)
Dutch low back pain study (46)	RCT at the individual level	+	+	**NS**	Graded exercise intervention compared to usual care for sick-listed workers with non-specific low back pain on return-to-work, cost of health care utilization and cost of productivity loss
MassBuilt Study (52)	RCT and Methods development study	+	**NA**	**NA**	Smoking cessation intervention with a curriculum that integrated occupational concerns and delivered in collaboration with unions to construction apprentices at 10 worksites
Safety & Health Involvement for Truckers (SHIFT) pilot study (53)	Single group pre-post test design	+	**NA**	**NA**	A weight loss and safe driving competition for truckers spending a lot of time alone on the job. Competition, computer-based trainings, behavioral self-monitoring, and motivational interviewing techniques were deployed successfully
Office ergonomics and sit-stand workstations (54)	RCT at the individual level	+	+	**NA**	Investigation of the effects of an office ergonomics training combined with sit-stand workstations on musculoskeletal and visual discomfort, behaviors and performance

			Economic Outcomes		
Study and Reference	**Design**	**Health Outcomes**	**Productivity Loss Reduction**	**Health Care Expenditures**	**Comment**
Australian sit-stand workstations project (55)	Quasi-experimental design with comparison group	+	**NS**	**NA**	Study on the impact of a sit-stand workstation on sitting time, blood lipids, blood glucose levels, and productivity indicators
Take-a-Stand Project (56)	Two-group pre-post comparison interrupted time series study	+	+	**NA**	Study on the effects of a sit-stand workstation on sitting time, mood states, back, neck, and shoulder pain, productivity, and other office behaviors

Note: RCT = randomized controlled trial; + =significant improvement; NS = non-significant change; NA = not available

Table 2

Reviews or Committee Reports on Integration of Worker Health Protection and Promotion Programs

			Economic Outcomes		
Review Type or Report	**Reference**	**Health Outcomes**	**Productivity Loss Reduction**	**Health Care Expenditures**	**Comment**
Literature review and framing of an integrated concept	61	LE	LE	LE	A review paper that describes the importance of the need to attend to both personal health practices and to organization of work when implementing workplace interventions to promote and protect worker health
Literature review on the impact of workplace-related organizational changes using the health circles model	62	+	+	NA	A review paper that assesses the impact of organizational changes induced as part of the health circles model in Germany on health and wellbeing and sickness absence outcomes
IOM Committee Report on the NASA program	18	+	NA	NA	Committee report which articulated both the rationale for an integrated approach to worker health and also proposed a structure for the implementation of such an approach
Literature review and analysis	63	NR†	NR†	NA	Occupational health interventions (defined as programs that eliminate or control hazards, change behavior and skills, or prevent illness or treat disease and related disabilities) and shows that despite the presence of high quality studies in this area, more research and improved methodologies are needed
Systematic review and best evidence synthesis	64	Mixed	NA	NA	Purpose of the review was to identify studies evaluating the effect of workplace interventions on visual or upper body musculoskeletal symptoms among computer users
Systematic review and meta-analysis	65	+	+	NA	Work health promotion conceptualized as an integrated worker health type of program and outcomes considered included well-being, work ability, and sickness absence
Literature review	66	+	+*	+*	Report describes the integration of health protection and health promotion programs, reviews existing literature, and describes various models to integration
Systematic review	67	+	+	+	Assessment of available evidence to consider whether health and productivity arguments as a result of occupational health and safety interventions make a good business case. Most studies included in this review were OSH studies only and do not meet the criteria for integrated worksite health protection and promotion programs
NIOSH Total Worker Health Report—1	17	+	+	NA	Report describes the rationale and scientific evidence for IWHPP as a means to enhance the effectiveness of efforts to promote and protect worker health.
NIOSH Total Worker Health Report—2	68	+	+*	+*	Report describes evidence supporting the value proposition for integration OSH and WHP programs
NIOSH Total Worker Health Report—3	4	+	NA¥	NA¥	Paper providing an economic analysis of potential gains an integrated approach to worker health may yield.

Note: + = significant positive outcomes reported;

* evidence based on separate health and productivity management-type studies that mostly report on health promotion, disease prevention, or other interventions separately;

¥ results suggest that workplace conditions and health habits both influence health and the interaction appears to be synergistic (indicate positive spillover suggesting economic efficiency);

† outcomes in this domain were assessed or studied but no results reported;

LE = Limited evidence; NA = not available; NR = not reported; NS = non-significant change

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Table 3

Case Examples of Single Employer Experiences of Integration of Worker Health Protection and Promotion Programs

Employer	References	Comment
3M	69	Integration of services including, but not limited to, health coaching, onsite seminars, supervisor trainings, behavioral health, employee assistance programs, and occupational health and safety into a comprehensive worker health protection and promotion initiative. Social support and policy initiatives are implemented across the organization to effectively promote health and wellness and protect worker health.
Chevron	70	Initiatives focused on the management of risks to avoid accidents, injuries, and illnesses through highlighting the relationship between health risks and on-the-job injuries. Multi-level and multi-component programming designed to stimulate culture change including the measurement of business unit specific progress toward and achievement of health and safety goals.
Dell	71, 72	Key safety initiatives are integrated with behavior-based health promotion programs to optimize the impact on worker health. Ergonomic programs, safety training, lifestyle change programs, stretching programs, among others, are directed and implemented through environmental health and safety teams that work in close collaboration with managers and leaders throughout the organization.
Dow Chemical	73	Health and human performance initiatives integrate health promotion, industrial hygiene, employee assistance programs, occupational safety and health, diversity, health benefits, and organizational development initiatives for the purpose of optimizing health promotion and protection efforts. A strong emphasis on measurement has made this an exemplar program with documented evidence of effectiveness.
IBM	18	Global standards for employee well-being and safety are integrated into a management system that ensures the compliance, planning, measurement, and improvement of industrial hygiene, ergonomics, safety, medical, wellness, and preventive benefit programs across IBM business units. The program is well-documented and recognized for its excellence.
Johnson & Johnson	74	Long-standing program with strong evidence of effectiveness (both and health and financial outcomes) that integrates safety and health improvement initiatives for its workers. Ongoing evaluation of the program continues to evolve the program as needed and present positive findings.
UAW-General Motors	75	Health and safety—at work and at home—are recognized as a number one priority. The program is integrated across heath, wellness, ergonomics, and safety with strong support and leadership commitment from the company and the union. The program has been well documented in terms of outcomes.
USAA	76	Areas of focus include workplace interventions for worker safety, creation of a culture of wellness, and support for individual-level interventions to optimize health. The program has been evaluated and continues to report significant benefits in health and financial outcomes.
Weyerhaeuser Company	77	Sport sciences based program to prevent injury and improve health and performance among tree planters. Highly detailed program designed to increase pre-planting season fitness levels and nutrition practices and in-depth documentation of performance (productivity) and injury prevention outcomes.