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at work

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Embedding essential skills training in OHS lessons can boost learning: study

A pilot project by the Institute for Work & Health finds improved learning when hoisting and rigging students receive essential skills content as part of OHS training

At construction sites, the work of rigging and hoisting loads comes with significant hazards. Crews must accurately calculate the weight of materials being hoisted and determine the appropriate rigging techniques and equipment to use. They have to take into account weather conditions, adjust for nearby obstacles such as power lines and, with each lift, run through a long checklist of precautions—many of which are required by law. Mistakes can result in dropped loads or even toppled cranes, potentially resulting in serious injuries or deaths.

Adding to the challenge of injury prevention in this line of work is the fact that many people in it have skills gaps when it comes to literacy, numeracy and other essential skills. That was why a research team led by the Institute for Work & Health focused on hoisting and rigging for a project on embedding essential skills learning into occupational health and safety (OHS) training. The team wanted to test the idea that modifying OHS training curricula to address gaps in essential skills among trainees could boost OHS learning and outcomes.

"We know workers are reluctant to sign up for dedicated workplace literacy training programs, because to sign up is to identify themselves as having a gap," says Dr. Ron Saunders, lead researcher on the project. "This becomes a challenge for OHS trainers because those taking the training may have essential skills gaps that make learning how to work safely difficult. Addressing this challenge was the motivation behind this research."

To test its idea, the research team modified a hoisting and rigging curriculum developed by the Infrastructure Health and Safety Association (IHSA)—the Ontario sector-based health and safety association that serves the construction sector—by embedding learning on two essential skills identified as key to working safely: numeracy and document use. The team found that learners who completed the modified training had significantly better post-training scores on a written test of course content than the learners who were given the usual training.

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Institute for Work & Health welcomes new board member

The Institute for Work & Health (IWH) extends a warm welcome to its newest board member, **Dr. Andréane Chénier**. Chénier is a national representative specializing in health and safety for the Canadian Union of Public Employees (CUPE). She brings a public-sector worker perspective as a representative on many committees, including the Ministry of Labour's Prevention Council. Chénier replaces **Lisa McCaskell**, who recently stepped down from the board. The Institute thanks McCaskell for her many years of service and her considered guidance as a member of the board since 2010 and vice-chair since 2013. For more about the board of directors, please go to: **www.iwh.on.ca/board-of-directors**.

IWH 2018 Activity Plan available online

Interested in learning of the Institute's activities in the year ahead? IWH research projects and knowledge transfer activities are all set out in its annual Activity Plan, available for download on IWH's website. To find it, go to: **www.iwh.on.ca/corporate-reports**. A searchable directory of current and recently completed projects can also be found at: **www.iwh.on.ca/projects**.

Institute now accepting applications for Syme fellowships

The Institute is now accepting applications for its 2018-2019 S. Leonard Syme Training Fellowships in Work & Health. The fellowships are for early-career researchers at the master's or doctoral level intending to study work and health. Typically, the Institute awards three fellowships of $5,000 in each competition, although it occasionally awards one major fellowship of up to $15,000. The deadline for applications is June 8. Learn more and apply at: **www.iwh.on.ca/opportunities/syme-fellowship.**

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What Research Can Do

How IWH findings, methods and expertise are making a difference

OHS change model informs WSPS's approach to small businesses

Ontario health and safety association taps into model's idea of "knowledge transformation leader" to advocate for change

Small businesses are a tough nut to crack for Ontario's health and safety system. They can be hard to reach, and they regularly juggle competing priorities with limited resources of time and money.

With this in mind, Workplace Safety and Prevention Services (WSPS)—Ontario's health and safety association serving the manufacturing, services and agricultural sectors—started up a Small Business Centre. Directly targeted to small businesses across the province, the centre provides occupational health and safety (OHS) business consultation and online resources.

But how best to engage small business in the centre? As he was looking for answers, WSPS Small Business Director Harry Stewart turned to the Institute for Work & Health (IWH) website—a resource he uses often. There, he found IWH Scientist Dr. Lynda Robson's model on breakthrough change in the workplace.

Robson defined breakthrough change as large, intentional, firm-level improvement in the prevention of injury or illness, and her work illustrated the factors critical to large and sustained organizational change. She developed a model that speaks to the processes and factors in common among organizations that have made large improvements in OHS.

According to the model, breakthrough change occurs in three phases: initiation, transformation and outcome. Initiation includes the integration of new knowledge into the organization through the work of a "knowledge transformation leader."

One of the first things Stewart and his team did was to overlay Robson's model onto their view of small business needs. The concept of "knowledge transformation leader" jumped out. "For us, whatever we develop or when we reach out, we understand our target is knowledge transformation leaders, and what we produce has to be suitable for them."

Indeed, the concept of the knowledge transformation leader is key to the Small Business Centre's framework, says Stewart. "There needs to be an OHS advocate [on the] inside. It can be anybody, from a high-level manager, to shop floor worker, to an OHS coordinator." And for a small business with resource limitations, the fact that a knowledge transformation leader can be anyone—not just a designated health and safety professional—is reassuring, he adds.

Using the breakthrough change model as a guide, Stewart and his team created infographics, videos and business cases to increase access to, and encourage adoption of, OHS information—all posted to their Small Business Centre website. "The breakthrough change model is…kind of a foundation for how we're moving forward," Stewart says. "We're using it as an approach. Everything we're looking at regarding outreach and solution development is built around aspects of the model."

In 2017, using the model once again, Stewart and his team piloted a program called the Small Business Advisory Service (for organizations with under 20 employees). By connecting businesses with Canadian Registered Safety Professional (CRSP) volunteers providing one-on-one consultation services, the Small Business Advisory Service strips away the intimidation factor that often daunts small, low-capacity businesses already facing barriers to implementing OHS improvements. It is designed to encourage change from a perspective other than OHS being a regulatory or legislated requirement.

The WSPS approach to small business is "a composite of our field intelligence, my own experience, the research that has been done…. It is about integrating health and safety into how [small businesses] work, not the other way around," says Stewart. The breakthrough change research plays a part in this approach, providing a framework for practical change through a successful client-focused program.

To read more about the model, and the research behind it, go to: **www.iwh.on.ca/projects/breakthrough-change-understanding-why-and-how-workplaces-make-large-improvements-in-ohs.**

This column is based upon an IWH impact case study originally published in December 2017.

Violence prevention efforts face challenges despite commitment from hospital leaders

IWH implementation study reveals concerns over issues such as staff training, security, reporting

Violence and aggression toward workers is a significant hazard in the health-care sector. In Ontario, it's one of the top five reasons for lost-time injuries among health-care workers. The issue, brought sharply into public attention with the 2005 workplace killing of a nurse in Windsor, Ont., has retained its high profile with the subsequent passage of two provincial bills in 2010 and 2016.

Despite the priority given to the topic, prevention efforts by health-care organizations still face certain challenges, according to a recent qualitative study by the Institute for Work & Health (IWH). The study, conducted in five hospitals representing the diversity of acute-care hospitals in Ontario, identifies several common challenges in the implementation of workplace violence prevention initiatives, as articulated by a cross-section of hospital front-line workers and managers.

"We heard a willingness across the board to address this issue. Senior management in all the hospitals involved in the study considered this a priority," says Dr. Agnieszka Kosny, lead researcher of the study. "However, these are large and complex organizations, and the reality on the ground can be quite different from what's set out in prevention programs."

The resulting report, *Implementing violence prevention legislation in hospitals*, and a two-page summary are available on the project webpage: **www.iwh.on.ca/projects/implementation-of-workplace-violence-legislation-in-ontario-hospitals**.

Challenges on the ground

Since Bill 168 came into force in 2010, employers in Ontario have been required to: establish violence prevention policies that are reviewed annually; develop and maintain a program for controlling risks, summoning assistance, responding to and reporting incidents; assess risks of workplace violence; and train and educate employees. Bill 132, which took effect in September 2016 while the study was in progress, expanded the definition of workplace harassment and violence to include sexual harassment and violence; it also imposed new employer responsibilities around the reporting and investigation of complaints.

The study set out to examine the key factors that helped or hindered the implementation of violence prevention policies and practices designed to meet the requirements of the 2010 legislation. Interviews and focus groups were conducted with 157 people. They included front-line health or medical workers, front-line non-medical workers (for example, staff in food services and security), hospital managers in various roles, as well as external key informants such as policy-makers, training developers, and union and employer representatives.

Participants agreed that a "cultural shift" has resulted in decreased acceptability of violence in health care. They described the implementation of violence prevention programs and some of the challenges that still existed. The researchers grouped the observations under six broad themes.

Training: Training was an important part of each hospital's violence prevention program. Hospitals provided training to all staff on a mandatory "core curriculum" including de-escalation, summoning assistance and reporting, often with more intensive training for staff in high-risk areas. However, a high overall training workload sometimes resulted in the expectation that staff would complete training on their own time. Also, a heavy reliance on online training meant some staff felt they had more difficulty retaining information and were not adequately prepared for real-life scenarios.

Organizational risk assessment: Organizational risk assessments examining work practices and environmental factors had been conducted at each hospital. A toolkit developed by the Public Services Health and Safety Association (PSHSA) was cited as a valuable resource. However, some confusion existed among staff about how often risk assessments were carried out, particularly as outcomes of these assessments were not always known to staff. A lack of consistency in the process (tools used, and frequency and quality of assessments) contributed to this confusion.

Flagging: Patient flagging was a contentious issue. Workers wanted information about previous aggressive behaviour, but some felt flagging could stigmatize patients and lead to differential treatment. A degree of "permanency" in the flagging process and a lack of gradation were also raised as issues. Workers reported some hesitation flagging patients when the violent act was perceived as unintentional or lacking malice. Information was not always well-communicated, particularly to non-clinical staff, and sometimes flagging did not result in clear clinical or behavioural plans.

Alarms: Hospitals had different ways of summoning assistance, including the use of duress badges, screamers (small devices that emit an extremely loud sound), intercoms, telephones and verbal communication. Most participants appreciated having access to personal alarms. They viewed this tangible investment by the hospital as a sign of commitment to violence prevention. However, concerns were raised about alarms that malfunctioned or had defects that weren't discovered until the alarms were needed. Some workers reported confusion about what to do once everyone assembled in response to an alarm (such as during "code white" situations).

Security: Differences were reported between hospitals that had in-house security and those that worked with externally contracted security teams. In-house security

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IWH's new guide on supporting workers with depression integrates research with practice

Evidence-based guide draws on a systematic review update and consultation with workers and managers

According to the Conference Board of Canada, nearly three million Canadians will experience depression in their lifetime—for most, during their prime working age of 24 to 44. The impact depression has on the workplace can be considerable. People with depression have higher rates of absenteeism and short-term disability than those without. They also experience higher rates of job turnover and productivity loss.

Despite growing awareness of the issue, many workplaces still struggle with what to do to help individuals experiencing depression. A research team at the Institute for Work & Health (IWH) is helping fill that knowledge gap.

The team conducted a systematic review of the research to date on interventions to help workers with depression. The team also sought out practices and approaches not currently captured in the research by conducting surveys, focus groups and interviews about workplace supports for people with depression. Based on both the systematic review and the consultation, the team developed a free guide on strategies to support employees with depressive symptoms. The *Evidence-informed guide to supporting people with depression in the workplace* is now available on the Institute's tools and guides webpage. Go to: **www.iwh.on.ca/tools-and-guides.**

"We have drawn upon the best research evidence and integrated it with both practitioner expertise and stakeholder values and preferences," says IWH Scientist Dr. Dwayne Van Eerd, one of the project co-leads. "We hope this helps bridge the research-to-practice gap and the research-to-policy gap that currently exist for depression-related disability management programs."

Findings from the systematic review

For the systematic review—an update of a 2012 review—the team conducted a literature search that identified studies that were potentially eligible for inclusion. Of these, 27 studies met all inclusion criteria: they involved a work-related intervention; focused on workers with depression; had a comparison group; had return to work or staying at work as an outcome; and were of high or medium quality when it came to the research methods used.

Most of the included studies were conducted in the Netherlands, the U.S. or Canada. There were 13 intervention types covered. The majority of the studies (18 out of 27) examined some form of cognitive behavioural therapy (CBT). A few studies looked at coordination of services and enhanced care management. The remaining one-off articles focused on various interventions such as strength training, aerobic training, relaxation training, stress reduction, part-time sick leave, nature-based rehabilitation and psychodynamic psychotherapy. As the single studies didn't provide enough evidence of effectiveness, the review team did not comment on these latter interventions.

The systematic review found moderate evidence that:

- **generic CBT** can help workers with depressive symptoms stay at work, but has no effect on helping people return to work; and
- **work-focused CBT** can help people with depressive symptoms stay at work and return to work after a depression-related absence.

"CBT teaches people strategies and skills to address the problems that come up in the here and now," says IWH Associate Scientist Dr. Kim Cullen, another co-lead on the study. The technique involves identifying, questioning and changing the thoughts, attitudes and beliefs that are related to the emotional and behavioural reactions that cause difficulty. Work-focused CBT involves using the same technique to address the thoughts, emotions, reactions and behaviours that come up at work.

"For example, workers currently on leave due to depression may feel particularly anxious about certain aspects of their jobs when contemplating returning to work," says Cullen. "If so, they may benefit from a counselling approach that helps them examine their self-talk and thought patterns around those challenging tasks. In time, these individuals may find themselves more

Violence prevention

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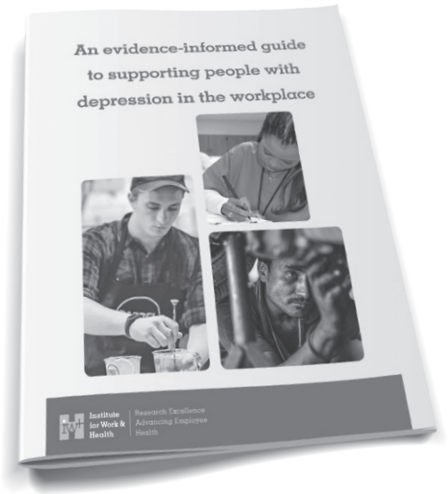
capable of managing their feelings around those job elements when they arise."

The number of medium or high quality studies included in the review was large enough to allow the team to probe a little more about how CBT should be delivered, Cullen notes. For example, does it matter whether CBT is delivered by clinicians or non-clinicians (such as peers or co-workers)? Only three studies in the review looked at interventions delivered by non-clinicians, but they seemed to have positive effects on return to work and stay at work. Does CBT have to be delivered one-on-one? Four of the studies looked at group therapy. This, too, seemed to help people stay at work and return to work. Does it matter whether CBT is delivered in person? Four studies looked at CBT delivered online or on the phone; these remote forms of delivery also seemed to help people stay at work.



Beyond the published evidence

Looking at the programs and practices examined in the peer-reviewed literature, the team noted an absence of one group of programs and practices that is known to affect workers' health outcomes. "The interventions we found in the literature were primarily those that target the individual. They address people's coping skills or resilience," Cullen said at a recent IWH Speaker Series presentation on this project. "There has been very little research—in fact, we found none—focusing on interventions that deal with organizational factors such as job stressors, social support at the workplace, job accommodations and so on. We know workplaces are addressing these factors, but their practices just haven't shown up in the research literature yet."

That's where the research team's consultation with workplace practitioners and workers came in. The consultation included surveys, focus groups, and interviews with human resources (HR) professionals, disability management professionals, occupational health and safety practitioners, and more. The aim was to find out what types of support they provide to workers with depression. The team also surveyed workers for their experiences receiving support—or not—for their depression at work.

The resulting guide outlines practices and strategies that may be useful to workers, co-workers, managers, union representatives and HR practitioners in all workplaces, regardless of sector or size. The strategies are grouped into three broad categories: workplace culture, workplace processes and resources (both at and outside of work).

Depression is a challenging condition to address in the workplace because it is invisible to others, as well as episodic and unpredictable in nature, says Emma Irvin, head of IWH's systematic review program and another co-lead on the project.

"This can make it particularly difficult for supervisors and managers to plan for work needs and implement and evaluate policies," she adds. "Because of this challenge, workplaces look to evidence-based practices whenever possible to minimize the effects of depression in their workforces. We hope that our work on the systematic review and the guide helps provide that service to workplaces."

teams were viewed more favourably by staff. They were seen as being well-trained and knowledgeable about the hospital's policies and environment, in contrast with outsourced security teams, which were described as being poorly trained and inexperienced. Participants were also conflicted about the role of security in certain units (such as mental health). Regardless of who provided the services, violence prevention and incident response were viewed as more effective when the role of security was transparent and clearly communicated to all staff (e.g. who takes the lead when a "code white" is called). Training in violence prevention was described as a key component of effective security teams.

Reporting: At each site, management spoke about the importance of reporting as a driver of policy, programming and training. However, certain incidents were less likely to be reported. These included verbal aggression, bullying, violent acts that perceptibly carried no intent, and incidents that resulted in no injury. Front-line staff also identified barriers to reporting, such as complicated and long reporting systems, little time to report during work hours, a lack of follow-up after a report was made, and fear of reprisal.

Emerging from the research findings are a number of factors that decision-makers might consider when developing, implementing and reviewing violence prevention programs. Examining the needs of different departments and staff will provide important information, while input from front-line staff can provide valuable insight. "We hope the issues raised in this study will help provide stakeholder perspectives on ongoing challenges, as well as strategies for improvement," says Kosny. "However, it's important to remember that these workplaces volunteered to be part of this study, so they were likely more motivated and farther ahead than many others in their violence prevention programs."

IWH study estimates costs of non-melanoma skin cancers due to sun exposure at work

Figure of $34.6M for cancers diagnosed in one year is the first estimate in Canada of the economic burden of work-related cases of two common forms of skin cancer

In 2011, just over five per cent of the newly diagnosed cases of basal cell carcinoma (2,846 of 53,696) in Canada were due to sun exposure at work. Just over nine per cent of the newly diagnosed cases of squamous cell carcinoma (1,710 of 18,549) were attributed to work-related sun exposure.

That's according to a recent study by the Institute for Work & Health (IWH), which put the cost of each case of work-related basal cell carcinoma at $5,670 and of work-related squamous cell carcinoma at $10,555.

The societal costs of these new cases from 2011 add up to $28.9 million in direct and indirect costs. Direct costs include health-care treatment and related expenses, and indirect costs include production losses. When intangible costs (such as the monetary equivalent of loss of quality of life) are included, the total social costs increase by another $5.7 million, to $34.6 million.

The study by IWH Senior Scientist Dr. Emile Tompa and visiting researcher Amir Mofidi was recently published in the *Journal of Occupational and Environmental Health*. The open-access article is available free of charge at: **http://www.tandfonline.com/doi/full/10.1080/15459624.2018.1447118**.

The study is the first ever analysis of the economic burden of work-related basal cell carcinoma and squamous cell carcinoma—which together are known as non-melanoma skin cancers.

These cancers are far more prevalent than melanoma, and basal cell carcinoma specifically is the most common form of any skin malignancy. Skin cancers are the most common form of cancer in Canada, accounting for a third of all cancers in the country.

According to previous research conducted by CAREX Canada, over 1.5 million Canadian workers are exposed to solar ultraviolet radiation (UV) on the job. About 900,000 of these individuals spend more than 75 per cent of their work days outdoors. (A high level of exposure to solar UV is defined as spending six hours or more outdoors per work day.)

Among the sectors in this high-risk category are construction (including road work), agriculture, and transportation and warehousing. The occupational groups in Canada with the highest levels of sun exposure are farmers and farm managers, construction trades helpers, and landscaping and ground maintenance labourers.

Three categories of costs

To calculate the economic burden of these occupational cancers, the study team first estimated the incidence of newly diagnosed non-melanoma skin cancers in 2011 attributed to work-related sun exposure. The attribution work was carried out by two members of the research team prior to this project.

Dr. Emile Tompa

The researchers then estimated the lifetime costs of these cancers using a method they had previously used to estimate the economic burden of lung cancers and mesotheliomas due to work-related asbestos exposure.

The team included in its estimates three broad categories of costs:

- direct costs – health-care costs related to diagnosis, treatment and follow-up; out-of-pocket costs related to travel for seeking care, prescription drugs, home-making services needed due to incapacity, vitamins and supplements, and more; and informal caregiving costs provided by family members;
- indirect costs – productivity losses, including the costs associated with lost days of work due to seeking treatment, illness and death; and costs associated with lost production at home; and
- intangible costs – pain, suffering and loss of enjoyment of life; and loss of engagement in social roles, including family, community, leisure and work roles.

The $34.6 million in total costs is made up of roughly 58.5 per cent direct costs, 25 per cent indirect costs, and 16.5 per cent intangible costs.

High survival rates

Because non-melanoma skin cancers tend to be caught early and treated efficiently, the economic burden of these cancers is predominantly from direct, treatment-related costs. Generally, treatment requires very little time off work for most cases, and the long-term consequences are few if caught early, says Tompa. The survival rate is 99.98 per cent for basal cell carcinoma and 99.30 per cent for squamous cell carcinoma.

The researchers also used the same approach to estimate the cost of newly diagnosed occupational non-melanoma skin cancers due to sun exposure in 2011 in the United States. They calculated the cost to be $1.7 billion (in Canadian dollars). They noted, however, that this may be an under-estimation, as health-care costs are likely higher in the U.S., and cancers due to sun exposure are likely more prevalent in the more southern latitudes of the country.

"We hope the availability of these estimates helps policy-makers, employers, unions and workers consider the impact of work-related sun exposure," says Tompa. "Knowing the economic burden of these two cancers may be useful, especially when the workplace interventions to reduce exposure to the sun—for example, shade structures, tinted windows on vehicles, shift schedules that avoid time spent in the midday sun, clothing and hats or sunscreen—tend not to be very expensive."

Workplace facilities and environments can help workers exercise during off-hours

Study suggests employers can promote workers' activity levels by highlighting amenities near or at work

Despite the known benefits of regular exercise, over half of adults fall short of getting the recommended 150 minutes of moderate-intensity physical activity a week.

Recognizing that most working-age adults spend a third or more of their day at work, some employers try to play their part to promote exercise among their staff. They offer wellness programs and facilities such as fitness classes and shower rooms, or they promote nearby facilities such as sports fields and bike paths.

Do these offerings support workers' physical activity levels outside of work? A new study led by Institute for Work & Health (IWH) Mustard Fellow Dr. Aviroop Biswas suggests they do. The study is now available as an open-access article in the journal *Preventive Medicine Reports* (doi: 10.1016/j.pmedr.2018.03.013). Findings were also shared at an IWH Speakers Series presentation in November 2017. Go to: **www.iwh.on.ca/events/speaker-series/2017-nov-07**.

The study found that leisure-time exercise levels were higher among workers who had access to some combination of the following facilities at or near work: a pleasant place to walk, playing fields, a gym, fitness classes, organized team sports, showers/change rooms and programs to improve health. Indeed, off-work exercise levels were twice as high among workers with access to all of these workplace facilities as they were among workers with access to none of them.

The study was based on a nationally representative survey of 60,650 workers who responded to the 2007-2008 edition of the Canadian Community Health Survey, a wide-ranging survey that Statistics Canada conducts every two years. This edition included questions on leisure-time exercise activity and access to wellness programs and facilities at or near the workplace.

The survey showed that 76 per cent of workers reported having access to at least one exercise-promoting workplace facility. "This is good news," says Biswas. "It indicates a large majority—about three-quarters of workers in Canada—have access to some combination of facilities and programs at work."

However, the study also pointed to differences in access: the one-quarter of workers with little to no access to these facilities were more likely to be non-white, be born outside of Canada, have a low education level, have a low income, hold a physically demanding job, work more than 40 hours a week, and have poor physical and mental health. These individuals often face many barriers to participating in exercise and are among the most physically inactive, explains Biswas. For example, they may live in unsafe neighbourhoods, have less spare time if they work multiple jobs, or find gym memberships and sporting activities unaffordable.

"Our findings suggest that workplaces can have an important role in increasing the exercise levels among those who need it most, but they need to do more to reach these individuals," says Biswas.

Examining combinations of amenities

Finding that leisure-time exercise levels were higher among workers with access to exercise-promoting facilities at or near work was one thing. But understanding whether these increased activity levels were related to this workplace access was another. Applying innovative research methods, Biswas and his team found that increased leisure-time exercise was linked to the availability of two different combinations of workplace facilities: having access to all the workplace facilities mentioned, and having access to a combination of a pleasant place to walk, showers/change rooms and programs to improve health.

"We are not completely sure why certain combinations of exercise-promotion offerings are linked to workers being more physically active, but we have some hunches," says Biswas. "The most diverse offering—all the possible facilities—would clearly appeal to the broadest group of workers, as it has something for everyone. The second combination—a pleasant place to walk, showers or change rooms, and wellness programs—though much more limited, also encourages different types of activities for different people."

For example, pleasant surroundings may encourage some people to take walks during their lunch breaks, whereas showers and change rooms may encourage others to engage in more rigorous exercise before or after their shifts, he explains.

Biswas notes that, in another study based on the same survey sample, older workers were more likely to cycle to work when they had showers and change rooms available to them at their workplaces. No such link was found in younger age groups. That study was published in January in the *Journal of Applied Gerontology* (doi:10.1177/0733464818755313).

"The findings of both studies should be encouraging," says Biswas. "A sizeable number of Canadian workers have access to offerings that promote exercise. Some of these offerings do not require a large upfront investment by the workplace. Rather, they can tap into the features that exist in the workplace already or in the surrounding areas to promote exercise among workers." ✚

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New guide lays out steps for embedding essential skills in OHS training modules

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Results from that pilot study were so encouraging that the training centre involved in the project, the Labourers' International Union of North America (LIUNA) Local 506 Training Centre, will keep the essential skills components as part of its rigging and hoisting curriculum. It may even make similar changes to other training programs.

"This was a small study, so we have to be cautious," says Saunders, who shared study findings last fall at an IWH Speaker Series presentation. "But our analysis says the learning—the performance on the written test at the end of the program—was significantly better for people who took the modified program. To achieve that with the small numbers we had means that the effect size was substantial."

In the wake of these findings, the team produced a guide that lays out the steps involved in embedding essential skills learning into OHS training. The guide, *Essential Skills and OHS Training*, is available at: **www.iwh.on.ca/tools-and-guides/essential-skills-and-ohs-training.**

According to the 2012 Survey of Adult Skills under the Programme for the International Assessment of Adult Competencies, nearly half of working-age adults in Canada scored Level 3 or lower in reading and more than half scored below Level 3 in numeracy. On the survey's scale of 1 to 5, Level 3 in reading is considered essential for most jobs, even jobs that don't require a college diploma, university degree or specialized training. According to Employment and Social Development Canada, the nine essential skills include reading, document use, numeracy, writing, oral communication, working with others, continuous learning, thinking skills and digital technology.

The team identified the hoisting and rigging program offered by LIUNA Local 506, which uses the curriculum developed by IHSA, as the best candidate for the pilot study. The team modified the curriculum to include new text on how to use Ontario's *Occupational Health and Safety Act* and regulations as reference documents, new explanations for different methods for calculating loads, and updated calculation examples that contain substeps.

Forty learners were recruited into the study and divided into two groups. One group received the modified training; the other group—the "control" group—received the regular curriculum plus additional review time to ensure in-class learning time was the same for the two groups. Study participants were assessed on their essential skills prior to the training. Scores on a written test given at the end of the training were examined to determine training effectiveness.

The study showed that scores on the post-training written test were significantly higher among those who took the modified program. This was after controlling for age, language, educational level, years of experience in construction, and years of experience in hoisting and rigging. The team also controlled for the pre-training scores on document-use ability; however, because many participants did not complete the numeracy section of the pre-training assessment, the team could not use scores from that section in the statistical analysis.

The team also conducted focus groups and interviews with 25 learners to explore their perspectives on their training needs. Learners spoke of the tension between safety and the pressure to be productive. Many spoke of the job insecurity they experienced as low-skilled workers. They also spoke of common shortcuts to avoid doing calculations, such as trial lifts or estimating loads. Some also noted that estimating is good enough in most instances when loads are familiar, but when a load is not standard, the consequences of a wrong estimation can be deadly.

"The focus groups brought to the fore that OHS training, including training that embeds essential skills learning, isn't enough to prevent accidents when workplace factors, such as productivity pressures and lack of empowerment, make it difficult for workers to apply what they've learned," says Saunders.