1. Increasing occupational health and safety in workplaces: why it matters*

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There are at least two ways to emphasize the importance of the health and safety themes that form the basis of this chapter. The first is at the big-picture level. Biddle (2004), reported that over 100 000 American workers died annually from occupational injuries. Her research developed a computer program estimating the national cost from these injuries, a figure of over US\$100 million annually. The International Labour Organization (ILO) estimates that about 2.3 million workers die annually from occupational accidents and diseases. Also, 1 million workers will suffer a workplace accident every day. These accidents cost an estimated 4 percent of gross domestic product (US\$2.8 trillion) owing to organizational and individual costs, for example, lost working time, worker's compensation, medical expenses and interruption to production. Finally, surveys of safety in a variety of industries, both small and large, indicate that many use outmoded methods to manage safety information, making little if any use of these data. This is particularly true of small business and businesses in general in the developing world. Finally, workers in many countries suffer exploitation at the hands of organizations in the developed world in terms of exposure to unsafe conditions and the handling of hazardous compounds.

The second way is to consider occupational health and safety at the micro level, the experiences every day of women and men at work. Here are some examples reported in the public domain, many on the same day.

Consider the following:

- Hurricane Harvey dumped over 50 inches of rain over parts of Texas in late August 2017 shutting down the majority of organizations, causing a few deaths and billions of dollars of destruction. You cannot fight Mother Nature but you can prepare for such disasters.
- A US military plane carrying 18 soldiers on route to Arizona for training, crashed on 11 July 2017 in Mississippi killing all 18. Witnesses said they had heard loud explosions when the plane was still high in the sky. Foul play has been ruled out.

- There has been a large increase in the manufacture of electric motor vehicles which is expected to accelerate. The Tesla battery contains about 150 pounds of graphite, a toxic product so dangerous it is mainly mined in China where little attention is paid to worker safety. China produces 66 percent of the world's graphite; India is second at 14 percent. Villages in China near where graphite is mined get enveloped in a grey shroud, covering homes, clothes and crops, and polluting drinking water. A Canadian company had planned to enter this lucrative market mining graphite in Canada but failed to meet safety standards. A related important issue is how do we dispose of these batteries.
- Worker death rates in China are 20 times higher than those in the UK.
- A study carried out in 20 countries by the Organisation for Economic Co-operation and Development (OECD) of the occurrence of physicians leaving objects in patients following surgery (for example, sponges, towels and knives) placed Canada in the top quarter of these mistakes.
- A US missile destroyer collided with a Japanese cargo ship killing seven US marine crew in the Sea of Japan in June 2017. The boat commander, two other senior officers and a few lower ranked seamen were relieved of duty but not fired as a result.
- France Telecom had a number of employee suicides in 2008 and 2009, and Renault, also in France, had a spate of suicides in both 2006 and 2008. Government studies attributed these in part to job demands and levels of stress, and large-scale organizational changes in strategy and size (downsizing).

ADDING SOME NEW ELEMENTS TO OCCUPATIONAL AND SAFETY RESEARCH AND INTERVENTION

This chapter has six important features that make it unique in the occupational health and safety field:

1. The chapter places a renewed and reinvigorating face on occupational health and safety issues. Accidents, injuries and deaths in the workplace continue on a daily basis worldwide. The challenges here, some ongoing and some new (for example, terrorism), have increased.
2. It examines traditional occupational health and safety content but also includes a wider range of health-related outcomes relevant to health

and safety (for example, incivility, toxic leadership, and disgruntled present and former employees).

3. It elevates the role of workplace stress in understanding and addressing occupational health and safety outcomes (accidents, errors, homicides and suicides).
4. The chapter documents the unique needs of small businesses (burglaries and robberies), which have typically been ignored in this area.
5. It includes a discussion of organizational responses to major occupational safety and health disasters.
6. It also examines a wider range of interventions to impact occupational health and safety outcomes including stress reduction initiatives (stress audits, mindfulness training, napping rooms for nurses working 12-hour shifts and de-escalation training for police officers).

The chapter gives health a higher priority, that is, the same standing as safety. It still considers the above listed more traditional content (for example, the handling of hazardous materials, and transformational leadership in improving safety performance), but expands the occupational health and safety experiences and outcomes to include more consideration of the emotional and psychological aspects of work experiences, and their effects on both health and safety (for example, bullying, sexual harassment, long work hours, workplace violence and active-shooter incidents).

Workplace stress affects workplace health and safety as well as employee well-being. An increasing number of specialists in workplace safety agree there is a direct association of increased levels of worker stress and increases in workplace accidents. This can be attributed to stress coping methods such as the use of alcohol or medications, preoccupation and distractions resulting from elevated stress levels, and higher levels of fatigue. Researchers with the National Institute for Occupational Safety and Health (NIOSH) have advocated accident reduction through stress management initiatives (Murphy et al 1986; Steffy et al. 1986). Sneddon et al. (2013) also advocate stress reduction as an intervention to reduce accident levels. They specifically highlight fatigue and sleep deprivation as reducing levels of alertness and attention, which increase the frequency of accidents.

INCREASING INTEREST IN OCCUPATIONAL HEALTH AND SAFETY CONCERNS

There is now a growing group of international researchers and practitioners interested in reducing occupational health and safety issues and

threats in the workplace and increasing individual and organizational health and performance. More professionals and managers in all sectors have become active in human resource management, career and talent development, healthy work, healthy people and healthy organizations as these are being affected by the work experiences of men and women. More professionals are now employed in government agencies (NIOSH, OECD and ILO) who are responsible for work and health. This area has become more important to governments and organizations as the threats to and incidence of adverse occupational health and safety outcomes has increased.

Occupational Health and Safety: A Necessary Growth Industry

As I started gathering recent material to help me with this chapter I found several sites, usually occupational health and safety consultants or law firms in the US. I started receiving materials from them several times a week about seminars, webinars and meetings on specific aspects of this general topic. It is clear that the US is increasingly interested in improving occupational health and safety. My own country, Canada, seems to be less active here.

A sample of courses and webinars addressed the following topics:

- dealing with an active shooter;
- investigating an accident or near accident;
- building a safety culture;
- increasing manager and executive investment in safety;
- giving special attention to temporary workers;
- the onboarding of new employees;
- dealing with toxic employees;
- increasing employee commitment to safety;
- types of safety glasses and safety gloves;
- the importance of wearing safety glasses on some types of jobs; and
- understanding new OSHA safety guidelines.

In addition, organizations can purchase training programs from vendors in many of these areas. An example would be the availability of drug-testing kits and drug-testing training programs.

Why Investing in Occupational Health and Safety Makes Sense

Investments in occupational health and safety can be justified in terms of what accidents and injuries cost. It has been estimated that a fatal injury

costs between US\$1 billion and US\$1.4 billion. Thus investing in health and safety will save money for organizations in the long run. However, a more important motivation is keeping workers safe. Organizations investing in occupational health and safety have more engaged employees who are also less likely to quit. Investing in occupational safety and health, then, is a business issue associated with future business success.

Senior executives often have difficulty communicating the value of such investments to others in their organization. Issues involve the difference between a cost and an investment and the failure to integrate occupational health and safety into their business strategy. Issues of employee safety, job performance and company reputation need to be put front and center. Occupational health and safety goals need to be closely tied to company business objectives, and the business value of successful occupational safety and health objectives more clearly identified.

STRESS AND EMPLOYEE HEALTH AND SAFETY

Murphy et al. (1986) reviewed the limited literature on the relationship of work stress and accidents or injury occurrence at work. Work stress is widespread and can influence individual feelings, perceptions, thought processes and performance, as well as physiological and biochemical responses. High levels of anxiety and depression and low self-worth have been found in workers prior to an accident. Pilots and crew members involved in aircraft accidents indicated more stressful life changes than others not involved in these accidents. Murphy et al. presented a model in which both work and non-work stressors increase anxiety, fatigue and alcohol use, and reduce motivation, which decrease capacities such as accuracy, reaction time, attention, reasoning, judgment and memory, which in turn increase risky work behaviors (for example, not wearing safety glasses) and improper use of equipment, thereby increasing workplace accidents and near misses. They reported the results of two studies of stress management training showing benefits in terms of accident claims and insurance losses. Employees also have a role to play here by following health and safety rules, wearing protective eye equipment, not texting while driving, following their training information and materials, and protecting co-workers and themselves from risk.

Sneddon et al. (2013) examined the effects of both work stress and fatigue on work situation awareness among drillers working off shore on the UK continental shelf. Drillers reporting high levels of stress, sleep disruption and fatigue indicated lower levels of work situation awareness, with stress being the strongest predictor.

Stress and Medical Errors

It is estimated that about 98 000 people die annually from medical errors in hospitals, more than deaths from motor vehicle accidents, breast cancer or AIDS (Committee on Quality of Health Care in America 2000). More people die from medical errors than from workplace accidents. Physicians suffer burnout, and physician burnout has been shown to increase medical errors (Shanafelt et al. 2010). Shanafelt et al. found that a stress reduction program that reduced burnout levels also reduced malpractice suits.

Medical errors by care providers lead to adverse health outcomes, as do to other factors such as improper use of medical equipment, poor or fatigued decision making, stress and cognitive overload (Peters and Peters 2007; Bogner 2010).

Stress and Medical Malpractice

Jones et al. (1988) carried out four studies on the relationship between stress and medical malpractice, and the potential value of stress management programs in reducing malpractice risk. First, hospital departments with malpractice suits reported higher levels of job stress than departments with fewer suits. Second, workplace stress levels predicted frequency of malpractice claims. Third, a longitudinal study showed a drop in medication errors following the introduction of a stress management program. Fourth, hospitals implementing stress management initiatives had fewer malpractice claims than matched hospitals without the stress management training over a two-year period.

Costs of Fatigue and Sleepiness

Rogers (2008) cited costs of fatigue in the US as US\$18 billion per year in lost productivity and accidents, with more than 1500 fatalities, 100 000 crashes and 76 000 injuries yearly attributed to fatigue-related driving on highways. She notes that two major nuclear power plant accidents (Chernobyl and Three Mile Island) and the running aground of the *Exxon Valdez* and subsequent oil spill disaster occurred at night, with sleep deprivation seen as one of the causal factors. In addition, sleep deprivation was cited as a factor in poor decisions made the night before the launch of the Space Shuttle *Challenger*.

Fatigue and Sleepiness in Nursing

Rogers (2008) reviewed the effects of sleepiness, a tendency to fall asleep, fatigue, a strong sense of tiredness, low energy and high levels of exhaustion

that reduce physical and/or cognitive functioning and nurse performance and patient safety. Both sleepiness and fatigue result from sleep deprivation. Her review of hundreds of studies indicated adverse health effects of sleep deprivation. Sleep deprivation was found to be associated with medical errors and risk of errors in nursing. It also puts nurse's health and safety at risk in terms of reduced driving ability and more sleep-related driving accidents. Increasing numbers of nurses are now working 12-hour shifts in order to better meet the needs of patients, and about 20 percent now indicate falling asleep while working.

Long Work Hours

Kivimaki et al (2015) undertook a meta-analysis investigating the association of long work hours and risk of coronary artery disease and stroke. They considered 25 longitudinal studies from 24 cohorts in Europe, the US and Australia. Controlling for age, sex, socioeconomic status and coronary heart disease and stroke at baseline, in a sample of 603 838 men and women, those individuals working 55 hours or more a week, compared with those working 35–40 hours a week, had a 13 percent greater chance of developing coronary heart disease. Also, in a sample of 528 908 women and men, they found those working 55 or more hours a week had a 33 percent increased risk of stroke.

SAFETY ISSUES IN THE WORKPLACE

Drug and Alcohol Use in the Workplace

A female school bus driver in Toronto has been charged with impaired driving. Her bus had 22 young students on board – fortunately none were injured when her bus struck a car (Rizza 2017).

Canada legalized the sale of marijuana in 2018, and several US states (for example, Colorado and California) have also legalized the purchase and consumption of marijuana. This raises issues of whether the use of marijuana before entering the workplace might have effects on employee health and safety behaviors (Phillips et al. 2015). Drivers in Ontario under the influence of cannabis will face large penalties (Benzie 2017).

Most drug users are employed, and it has been found that at least 14 percent of the workforce used an illicit drug in the preceding year (Frone 2011). Employees using drugs can influence events in their larger work environment. Drug use reduces cognitive abilities and reaction times, and

has been associated with lower levels of attendance at work, poorer job performance and higher levels of workplace accidents and injuries

A larger number of employees have used alcohol in the past year (Frone 2011). The majority of employed women and men have had some alcohol either with a meal or to relax. However, some of these people are unable to control the amount of alcohol they consume. Alcoholism costs organizations billions of dollars each year in absenteeism, on-the-job injuries, reduced productivity, and health compensation. Also, some colleagues may get injured because of the actions of a drunk colleague.

Domestic Violence in Workplaces

Employees, typically women, experience domestic violence at home, and sometimes in their workplaces (54 percent), with a majority reporting that domestic violence reduced their workplace job performance (82 percent), and many noting missing work or coming late to work (38 percent), according to a recent Canadian study of 8000 workers (Wathen et al. 2014). Employing organizations in Canada lose almost C\$80 million annually as a result (Zhang et al. 2012).

Guns in the Workplace

Many states in the US allow employees to bring guns with them to their workplaces. This probably increases the risk of an active-shooter scenario in workplaces (for example, the San Francisco UPS shootings and the Orlando shooter who killed five co-workers). Organizations need to develop an active-shooter emergency action plan and train employees on how to respond to an active-shooter scenario. In addition, planning on the best responses for all employees at the conclusion of an active-shooter incident must be undertaken.

Hazardous Materials

Mesothelioma is a rare type of cancer that develops in the lungs, abdomen or heart caused by coming into contact with asbestos. Mesothelioma has no known cure and therefore a poor prognosis. About 2400–2800 people in the US are diagnosed with mesothelioma each year, symptoms sometimes taking 20 to 30 years to appear. Life expectancy of mesothelioma victims is short. Mesothelioma patients and their families have received compensation through legal settlements from organizations that produced, made or distributed asbestos products. The average mesothelioma settlement was between US\$1 million and US\$1.4 million.

Grzywacs et al. (2011) document the effects of pesticide exposure on the health of Latino farm workers. Sparling et al. (2017) reported on the link between pesticide exposure and Parkinson's disease.

Transporting Hazardous Materials

On 5 July 2013, at 10.50 p.m., a train carrying 7.7 million liters of crude petroleum arrived in Antec, Quebec. The engineer parked the train on an incline. A small fire first broke out. Then the brakes were unable to hold the train and it rolled down toward Lac-Magantic, derailing almost the entire train at 1.15 a.m. About 6 million liters of crude were released from most of the 63 derailed tank cars. A larger fire and explosions broke out, leaving 47 people dead and about 2000 homeless as most of downtown Lac-Magantic was demolished. Interestingly, the crude in the tank cars was more volatile than indicated on shipping documents. Two years after this disaster, many residents still exhibited signs of post-traumatic stress disorder, levels of anxiety being very high. The plan is to again allow similar trains to follow this route. Survivors received financial compensation from a C\$435 million total compensation agreement. Six former railway employees faced criminal charges. The Transportation and Safety Board of Canada investigated this disaster and made several recommendations to prevent future accidents (for example, strengthen tank cars, the creation of emergency response assistance plans, and additional defenses to prevent runaway trains).

UNIQUE NEEDS OF SMALL BUSINESSES IN OCCUPATIONAL HEALTH AND SAFETY

About half of working Canadians in the private sector work in small businesses. Small-business owners are legally required to provide and maintain a safe and healthy workplace for their employees, customers or clients, and visitors. Unfortunately, small businesses have higher fatality rates than large businesses. Small businesses need support so they can understand occupational health and safety regulations, address them despite economic and information limitations, the lack of occupational health and safety systems, and information and accesses specifically targeted at small business. Evaluations of studies of intervention effectiveness in small business (unfortunately only five studies) had positive effects in safety-related outcomes such as employee beliefs and health outcomes (McCoy et al. 2014), and a larger study of 260 companies reported that increasing worker wellness improved worker safety (Newman et al. 2015).

The unique occupational and safety needs of small businesses typically receive little attention. Small businesses (for example, convenience stores, gas stations and 24-hour operations) are particularly vulnerable to robberies and burglaries. Small-business owners can take several steps to protect staff and prevent robberies and burglaries. These would involve the use of more adequately locked doors, installing an alarm system, improved lighting, installing a panic button to push in case of robberies, the removal of expensive products from windows at night, training the staff, having two staff members at all times, keeping cash held on the premises to a minimum, developing relationships with other small-business owners in the same area to foster information sharing and to share the costs of lighting and private security, in some cases, and to talk with police before an incident occurs.

OSHA *Small Business Handbook*

The US Occupational Safety and Health Administration (OSHA 2005) created a handbook specifically for small-business owners and managers of small businesses. The OSHA lays out a four-point program: management commitment and employee involvement, worksite analysis, hazard prevention and control, and training employees, supervisors and managers. They go into great detail in each of these areas, offering guidance on how to start, designating responsibility, organizing the workplace, fact gathering, creating a plan, the use of checklists, action plan worksheets and how to obtain further OSHA assistance.

DEALING WITH OCCUPATIONAL SAFETY AND HEALTH DISASTERS

Hurricane Katrina, the 11 September 2001 (9/11) attack on the World Trade Center, and the *Deepwater Horizon* explosion and oil spill in the Gulf of Mexico would qualify as occupation health and safety disasters. Other workplace disasters would include fires, explosions, oil spills, mine collapses, workplace shootings, and terrorist attacks on hotels, restaurants and airports.

Organizations are sometimes affected by natural disasters, such as Hurricane Katrina, as well as by disasters associated with employee behavior and workplace cultures such as serious workplace accidents, fires, explosions, crashes and injuries (for example, the BP *Deepwater Horizon* explosion). There are also disasters resulting from acts of terrorism, armed robberies and domestic violence incidents in the workplace.

Emergencies and disasters are unplanned, but employers can create safety and health management systems that shape their ability to handle such disasters. Here are some guidelines.

- Create a written emergency response plan.
- Communicate and discuss this plan with all employees. The plan should identify escape procedures and escape routes, responsibilities, who does what, the shutting down of plant operations (if relevant), a system of accounting for all employees, rescue and medical activities for staff who undertake them.
- Create emergency response teams who are fully trained in first aid, use of fire extinguishers, chemical spill control, search and emergency rescue procedures, and trauma counseling.
- Contacts with outside organizations such as fire departments, police, ambulance services and hospitals.

In all these disaster incidents, organizations also needed to deal with post-traumatic stress symptoms, to hold a post-incident debriefing for witnesses of the events and, in some cases, bereavement sessions in the case of deaths.

The BP *Deepwater Horizon* Disaster

The BP *Deepwater Horizon* disaster in April 2010 has received substantial analysis. This disaster killed 11 employees, created the worst oil spill in US history and cost BP billions of dollars in settlements. BP itself has come under criticism for cutting corners over several years, valuing speed over safety, and not having a safety plan to cope with a large oil spill. BP had no accidents for a few years before the 2010 disaster and became overconfident. A series of small decisions made over a long period of time led to the disaster, and once the disaster began, the crew failed to act quickly enough. Merji and DeWolf (2013), using a wide variety of secondary sources, concluded that the BP management of his disaster fell short in several critical ways. Studies of disasters usually use a three-stage model: pre-crisis – the crisis of management in terms of preparation and prevention, operational crisis – how the organization responds to the immediate crisis, and post-crisis – what it does to recover and legitimate its reputation and return to normal business routines. Merji and DeWolf concluded that BP did not perform well at any of these three crisis stages.

Other major disasters, such as the 1988 *Piper Alpha* North Sea oil rig explosion, the Montara explosion off Western Australia, the 1986 explosion of the Space Shuttle *Challenger*, followed by the 2003 explosion

of *Columbia*, the 2011 Fukushima nuclear plant disaster, had a human dimension. All were human-made disasters that could have been prevented by acknowledging that accidents can happen in any organization, monitoring events and identifying and changing aspects of workplace culture that increased risks and hazards. It is also important that various levels of government and industry leaders work together to better prepare, train for, and address similar disasters.

Supporting First or Emergency Responders

There is considerable evidence that first responders often pay a heavy price for their efforts. Using data from 27 449 World Trade Center rescue and recovery workers, Wisnevesky et al. (2011), in a longitudinal study, found higher rates of physical and psychological health disorders. In another longitudinal study of the World Trade Center disaster, Jordan et al. (2011) reported higher than expected rates of mortality among first responders.

In the 9/11 terrorist attack on the World Trade Center in New York City, 450 emergency responders died, with hundreds more seriously injured. The Rand Corporation shortly thereafter convened a series of expert meetings on ways to better equip, train and support first responders. This work resulted in four volumes, the first published in 2002 (Jenkins et al. 2002), featuring ways of protecting emergency responders. These included, among others, personal protective equipment, information and training and site management strategies for increasing personal protection.

IRRESPONSIBLE AND EXPLOITATIVE WORKING CONDITIONS

Rana Plaza, an eight-story building collapsed in Savar, a district on the outskirts of Dhaka, capital of Bangladesh, collapsed in 2013 (Aulakh 2015). The death toll reached 1129, with 2515 people injured. Cracks in the building emerged early the previous day, yet workers were forced back to work the next day. The top floors were built without a permit, the building was not intended to be factories and substandard construction materials were used. Police in Bangladesh charged 41 people with murder.

In addition, there are some organizational sectors in which other types of irresponsible behavior that reduce health and safety are being undertaken which affect large numbers of individuals (Burke 2018). These include human trafficking, human slavery, sweatshops and child labor.

Violence in the Workplace

A disgruntled UPS employee in San Francisco killed two employees then himself. A man who was fired from a Florida awning factory returned and killed five people before taking his own life. The phrase ‘going postal’ emerged about 20 years ago to capture an increase in instances where disgruntled postal employees came to work with weapons and killed some of their colleagues. The postal service today does not have a monopoly on such events.

There often are warning signs of such behavior but these are usually ignored. Violence-prone behaviors include increased use of alcohol and drugs, increased lateness and absenteeism, depression and withdrawal, heightened levels of anger, making threats or verbally abusive comments to co-workers, making comments about suicidal thoughts and mood swings.

Workplace violence refers to any act in a workplace in which a person is abused, threatened, intimidated, assaulted or killed (Statistics Canada 2009). In the US from 2006 to 2010, an average of 551 workers were killed in work-related homicides annually (Bureau of Labor Statistics 2015). In 2010, there were 518 workplace homicides, accounting for 10 percent of all fatal workplace injuries. Shootings represented 78 percent of all workplace homicides in 2014, with most (83 percent) occurring in the private sector. Most workplace homicides involved men (72 percent). Types of assailants varied depending on whether the victim was man or a woman. More women were killed by relatives or personal acquaintances than men (39 percent women and 3 percent men). In 2004, workplace homicides were more likely to occur in the retail trade (17 percent), government (17 percent) and leisure and hospitality (15 percent).

Murder is the leading cause of workplace fatalities, most being robbery related. Incidents of workplace violence negatively affect organizations through of lost productivity, higher costs of insurance, costs of additional security, and image concerns.

Some types of work or working conditions increase the risk of workplace violence. These include having direct contact with clients, handling cash, valuables or prescription drugs, working alone or in small numbers, working with unstable or volatile people, working where alcohol is served, working in a community-based setting, working in high-crime areas, securing or protecting valuable goods and transporting people or goods. Every country in the developed world, and probably beyond, has created legislation addressing workplace violence (Ontario Ministry of Labour 2016). All jurisdictions have legislation against workplace violence typically related to their criminal code.

Suicide in the Workplace

Job stress emerges as a key factor in workplace suicide. Suicides account for about 31 percent of all deaths at work. The average age of an American suicide is 44 years, a midlife working age. Stalk and Bowman (2012) found that at least 11 percent of suicides were related to job problems. These job problems included poor performance reviews, tensions with co-workers, increased job pressures, and fear of layoffs and unemployment. An Australian study (Routley and Ozanne-Smith 2012) reported that 17 percent of suicides were work related, and causes included job demotions, conflict with co-workers, the result of being bullied and having a low level of control at work. Worker suicide, then, is the interaction between vulnerable individuals (for example, those with mental health problems), stress at work (for example, job insecurity, psychosocial job stressors, a boring work, high job demands and low job control) and living conditions that are stressful.

Milner et al. (2013), using meta-analysis of 34 studies, examined suicide rates in various occupations. They found that workers in the lowest skilled occupations (for example, laborers and cleaners) were at higher risk than workers in higher skilled occupations (for example, managers and clerical support workers). High-risk occupations include workers who are disadvantaged in their level of education, access to services, limited social resources, low quality of jobs, exposure to other job risks and limited access to community support.

Temporary Workers

Mojtehedzadeh and Kennedy (2017a) focus on the rights of temporary workers in Toronto, Canada. Mojtehedzadeh went undercover via a temporary employment agency to begin employment as a temporary worker at Fiera Foods, an industrial bakery. She and others placed circular pastry dough into soft plastic trays. She received 5 minutes' training. Temporary workers were told not to wear jewelry. She was paid in cash, and considered to be an employee of the placement agency rather than Fiera Foods. Supervisors shouted at them to work faster. Fiera employs about 1200 workers and says it values health and safety and helping immigrants to Canada. In general, temporary employees receive little training, have few rights, are given no promises of future commitments, no job security, can be fired with no notice and often work in the most risky jobs. Mojtehedzadeh was paid 10 cents below Ontario's minimum wage. She was not told where the fire extinguishers were, nor where the exits were. Temporary workers can refuse risky work but are reluctant to do so for fear of losing their jobs.

Though temporary workers get injured more often on their jobs than do permanent workers, temporary workers are afraid to admit their injuries, again for fear of losing their jobs.

Three Fiera employees have died at the workplace since 1999 (Mojtehdzadeh and Kennedy 2017b). One died while cleaning the inside of a vat and was crushed when someone started the mixer. A second employee was killed when struck by a car driven by another employee going home after work. A third employee died after only two weeks on the job when her hijab got caught in some machinery (Kennedy and Mojtehdzadeh 2017). After investigating this last incident, Fiera was charged with 39 health and safety violations. Fiera has been charged with 191 orders for health and safety violations over the past 20 years.

Fiera Foods was fined US\$300 000 under the Occupational Health and Safety Act (Mojtehdzadeh and Kennedy 2017c). This fine was double that given to Fiera in 2002 for the death of 17-year-old temporary worker, Ivan Golyashov. Fiera was also required to hire an independent auditor of their health and safety and temporary agency processes. Grocers that sell Fiera products have asked to meet with the company to discuss Fiera's health and safety and employment standards that the grocers expect of their suppliers.

Precarious Work

Vives et al. (2013) examined the association of precarious employment and poor mental health in a sample of 5679 permanent and temporary workers in Spain. Their data were collected during 2004–05. Six dimensions of precariousness were considered: instability, low wages, employee rights, disempowerment, vulnerability and capacity to exercise rights (for example, access to vacation time). Both men and women in more precarious jobs reported poorer mental health (for example, nervousness, anxiety, depression and psychological distress).

CREATING SAFETY CULTURES

A safety culture is a product of positive workplace attitudes and behaviors of all employees at every level, acceptance of these attitudes and behaviors as vital, the presence of health and safety goals, policies and procedures supporting health and safety improvements, and employees accepting responsibility for levels of safety and safety improvements. A safety culture reflects how safety is managed in the organization. We know a lot about what an effective safety culture looks like, and research over the past

decade in high-risk occupations (for example, off-shore rigs and mining) have supported the benefits of these efforts.

Workplace injuries, illnesses and deaths result in physical, financial and emotional costs to individuals and their families. There are also costs to employing organizations as well. The OSHA (2012) developed a White Paper on injury and illness prevention programs. These programs are proactive processes to help employers identify and fix workplace hazards before injuries or illness occurs. They indicate the benefits of developing such programs and their success in reducing injuries, illness and deaths. These programs typically include common features: management, leadership, employee participation, hazard identification and their addressing, training workers in how the program works, and periodic evaluation of the program efforts to identify potential improvements. They cite evidence of the success of these programs in reducing illness, injuries and deaths in various US states and in several industrial sectors in the US, including the Department of Defense. Small businesses have also benefitted from such programs.

Wachter and Yorio (2014), using manager and employee surveys, examined the relationship of safety management practices with objective safety statistics (for example, accident rates), and how these practices improved safety results through levels of employee engagement. The ten safety management practices were employee involvement and influence, pre-and post-task safety reviews, safe work procedures, hiring for safety, cooperation facilitation, safety training, communication and information sharing, accident investigation, detection and monitoring, and safe task assignments (task-employee matching). They observed: a negative relationship between the presence of the ten individual safety management practices, and their composite, with accident rates; a negative relationship with level of safety-focused worker emotional and cognitive engagement and accident rates; safety management systems that were positively associated with worker engagement ratings; and worker engagement moderated the relationship of safety management practices and safety outcomes (for example, accident rates).

Investigating Occupational Safety and Health Incidents

It is important that all occupational safety and health incidents are both reported and investigated, a requirement in many jurisdictions, and very useful in identifying causes and potential remedies. However, as Probst and Graso (2011) have reported, accidents tend to be under-reported and under-investigated. Several consulting organizations in the occupational safety and health area have created software to make investigations more efficient, standardized and effective.

The following steps need to be taken in a full investigation:

- Bring all the people needed to conduct the investigation together.
- Close off the area in which the incident occurred and seal it off.
- Identify people who might have seen the incident and bring them together.
- Interview the worker involved.
- Interview all witnesses.
- Photograph the incident scene for future reference.
- Write a report stating what caused the incident and what could prevent future incidents.
- Engage in a future follow-up of these suggestions.

INTERVENTIONS TO INCREASE OCCUPATIONAL HEALTH AND SAFETY

The good news is that occupational safety and health researchers, consultants and organizational managers, working together on occasion, have made strides in reducing workplace stress, injuries and deaths, and have improving well-being. A sample of these initiatives follows.

Increasing Employee Voice

In many workplaces, employees are reluctant to speak up about what they observe happening, even when it gets in the way of performance, for fear of disagreeing with higher levels of management or appearing stupid. Fear of speaking up has been found to be associated with higher levels of unsafe behavior and adverse outcomes in several sectors. Studies in the healthcare sector in particular have documented barriers in nursing staff in exercising their voice with doctors, sometimes resulting in unsafe work practices and accidents.

Belyansky et al. (2011), in a study of surgical resident or trainees and surgeons, asked them to recall an incident when a trainee spoke up and prevented an adverse event. Over 70 percent of trainees indicated that speaking up prevented such an event. Sayre et al. (2012a, 2012b) undertook two interventions to increase speaking up by nursing staff. Both involved training sessions to encourage nurses to speak up. The training in their 2012a study began with discussions of speaking up and why it was vital, showing in vignettes that speaking up increased patient safety and effectiveness, indicated support from senior hospital leadership for speaking up, and had nurses develop a personal action plan to increase their speaking

up. A control group received no training. Follow-up data showed an increase in speaking-up levels by the trained nurses. Sayre et al.'s 2012b study replicated these findings.

Reducing Workplace Violence

Employers have a legal and moral obligation to create a workplace free of threats and violence.

The US Department of Justice (2002, p. 15) suggests the following roles:

- Adopt a zero-tolerance workplace violence policy and prevention program and communicate the policy and program to all employees.
- Identify areas within the workplace that have a higher potential for violence (for example reception and warehouse).
- Provide regular training in preventative measures for all new and current employees, supervisors and managers. Define what workplace violence is and identify violence-prone behaviors.
- Support victims of workplace or domestic violence.
- Adopt and practice fair and consistent disciplinary practices.
- Foster a climate of trust and respect among workers and between employees and management.
- Stabilize the workplace after an incident.
- Help to prevent future incidents.

Organizations can also undertake preventative measures. These include workplace design, administrative practices and work practices. Workplace design could involve creating physical barriers, reducing the number of entrances, using keys or access cards to control entrance, using better exterior lighting and placing employees closer to exits. Administrative practices might include keeping cash at a minimum, using locked safe deposit boxes. Work practices could include having a buddy system to provide support and protection, knowing where co-workers should be, and checking the credentials of clients and customers.

It is also important to address the aftermath of violence at work. The effects of violence remain after the violent act is over, and others besides the victim(s) are affected. Employee distress is heightened and must be dealt with quickly through the provision of information about what happened. Short-term and long-term psychological support is likely to be needed. Critical incident debriefing, trauma counseling and employee assistance programs can help victims as well.

After a violent incident organizations should undertake the following (Bishop et al. 2006):

- Bring all employees together immediately.
- Ensure that senior levels of management are present.
- Make counseling services available to those feeling a need.
- Have a social event a few weeks later and invite family members.

Dealing with an Active Shooter

An increasing number of active workplace shooters has occurred in the US, most recently in both San Francisco and Orlando. An active shooter is a person(s) actively involved in killing or trying to kill people in a workplace setting. Employers need to improve the protection of their employees from risks of an active shooter, and should be on the look-out for early warning signs that an employee might become an active shooter. Employers need to develop workplace violence plans that deal with potential active shooters. This involves training employees in how best to respond to active-shooter incidents. In addition, employers need to develop plans and programs for addressing the trauma to their employees.

Suicide Prevention Initiatives

There are a variety of organizations working in mental health and suicide prevention to help employers counsel employees and to help them prepare for and respond to suicide. Organizations of all sizes need to create and implement policies and programs that develop a mentally healthy workforce and prevent suicidal thoughts and behaviors. Most suicides are committed by people of working age and suicide is the leading cause of death for men aged 25–44 years and women aged 25–34 years.

Milner et al. (2014) reviewed published and unpublished writing on suicide prevention initiatives in the workplace. Very few of these efforts had been evaluated. Reducing suicide has individual, workplace and economic benefits. Milner et al. reviewed 13 interventions that included education and training, training the trainers, training and community awareness, how to assist co-workers after the suicide of a fellow employee, training to help a potential suicide victim stay safe, training and education of administrators and teaching individuals to identify a personal risk. Suicide prevention programs for the most part were short-lived standalone training programs in high-risk occupations and industries (for example, mining).

Boccio and Macari (2014) developed their safe haven model (SHM) for managers interested in initiating suicide prevention initiatives. The model

has three emphases: creating a positive and supportive workplace that fosters psychological well-being; improving managers' and co-worker's understanding of risk factors for suicide, and recognizing them; and encouraging the use of mental health support services.

Drug- and Alcohol-Testing Programs

Very little research has examined drug testing in the workplace as a safety strategy. Most of the studies had methodological flaws, making it difficult to draw any conclusions. One rigorous study did show that drug-testing efforts reduced fatal accidents in the transportation industry (Pidd and Roche 2014). A study of employees in a large transportation company in Portugal (not included in the Pidd and Roche 2014 review) investigating the relationship of alcohol and drug testing and accidents over a five-year period, found that alcohol and drug testing reduced the risk of accidents (Marques et al. 2014).

Drug testing and educational programs can potentially reduce workplace accidents, decrease employee theft, increase productivity, and reduce turnover and absenteeism.

Toxic Employees

Many organizations have one or more toxic employees – employees that are always stirring up trouble with others. These employees are more likely to treat co-workers poorly and, in extreme cases, engage in violent behavior. Organizations need to take steps to identify their toxic employees before they can bully others, exhibit hostile behaviors and criticize others. Sometimes toxic employees can be identified in reference checks and not even hired. Toxic employees need to be talked with to identify why they behave this way and encouraged to change (that is, stop) this behavior. A meeting should be held with them a short time later to see if their behavior has changed. Some toxic employees can be coached as well. Supervisors have a major role to play in this effort.

Resilience Training

McCraty and Nila (2017) describe their ongoing research program on the effects of resilience training on police officer behavior and job performance. The overall goals of this training is to build and sustain officer resilience and reduce stress and psychological and physical health problems. The goals of this program are to:

- increase officers' ability to think clearly and identify appropriate responses to problems under pressure;
- increase their ability to be fully aware of their situation;
- reduce officers' stress symptoms;
- increase officers' resilience and stress tolerance;
- support intelligent use of their energy and resources and regain these more quickly; and
- increase officer's ability to minimize ineffective thoughts, feelings and behaviors.

They have found that their training programs reduce stress reactions, increase officer confidence in stressful situations, increase job performance and increase vitality and officer relationships with their families.

Mindfulness at Work

Mindfulness is a state of non-judgmental attentiveness to, and awareness of, our moment-to-moment experiences (Brown and Ryan 2003) – a psychological state in which individuals focus attention on events occurring in the here and now. Mindfulness treatments and training, including mindfulness meditations, have been found to be associated with improved health outcomes (Moore 2017). Mindfulness reduces stress levels and is now included in an increasing number of wellness programs.

Mindfulness is increasingly seen as relevant to both health and workplace performance, and is positively related to elements of work engagement and job satisfaction and negatively related to quit intentions (Dane and Brummel 2013). Reb et al. (2014) collected data from supervisors and their subordinates and reported that supervisors' scores on mindfulness were negatively correlated with subordinates' levels of exhaustion and positively correlated with subordinates' levels of work-life balance and ratings of their job performance.

Corporate Wellness Programs

Corporate wellness programs are long-term organizational initiatives aimed at supporting organizational practices and personal behavior associated with higher levels of employee physiological, emotional and social well-being (Wolfe and Parker 1994). Berry et al. (2010, p. 106) define a corporate wellness program as 'an organized, employer-sponsored program that is designed to support employees (and sometimes their families) as they adopt and sustain behaviors that reduce health risks, improve quality of life, enhance personal effectiveness, and benefit the organization's

bottom line'. Healthy employees help organizations achieve healthy profits (Goetzel and Ozminkowski 2008).

Isaac and Ratzan (2013), from Johnson & Johnson, describe its program, which showed that for every dollar invested in wellness, Johnson & Johnson received nearly US\$4 in lower healthcare costs, less absenteeism and more productivity. Four central beliefs made their program successful:

- a definition of health that includes well-being;
- prevention-focused educational offerings;
- rewards for healthy behaviors; and
- creating a workplace environment supporting employees in engaging in healthy behaviors.

Trauma Counseling

Employees in various occupations witness injuries and deaths. These occupations include police officers, first responders, firefighters, and transit employees working on subways that witness individuals committing suicide by jumping in front of a moving train. Organizations need to create programs that address the trauma that usually results from witnessing these events.

Post-traumatic stress disorder (PTSD) is a psychological reaction to a very stressful and physically challenging event or experience that commonly produces anxiety, depression, flashbacks, hypervigilance, suicidal thoughts and other psychological health issues. There are both physical and behavioral signs of PTSD that individuals and supervisors need to pay attention to. In addition, a pro-counseling culture is a necessity. Training courses should include content on PTSD, its signs and the potential value of treatment. Several forms of therapy have been found to be effective in addressing PTSD.

Following such a workplace event, the worksite should ideally be closed, with senior management indicating that action. Supervisors then should meet with every employee to assess their responses and whether additional professional help might be required. Witnesses should be given a break from work to recuperate, encouraged to talk about the incident and not rushed back to work. Engaging outside professionals may be required in cases of PTSD. Critical incident stress responses may last several weeks.

Engaging Patients in Patient Safety

In-patients and out-patients can experience 'adverse effects' or 'adverse events' defined as 'unintended harm to the patient by an act of

commission or omission rather than the underlying disease or condition of the patient' (Institute of Medicine 2000, p.317). Adverse events can include: adverse events per se, that is, injuries from medical care rather than the normal history of the illness; near misses, that is, errors with the potential for injury but no harm resulted as the error was quickly identified; and medical errors with minimal risk of harm (Weingart et al. 2005).

Weingart et al. (2011), in a survey of 2015 patients, reported that patients having greater participation in their care indicated greater satisfaction with the quality of their care and fewer adverse effects. Weingart et al. (2005), in a sample of 228 hospital in-patients, found they were able to identify adverse events or near misses affecting their care (for example, errors or injuries). Some of these were seen as potentially life-threatening. Interestingly, none of these incidents were present on hospital incident reporting sheets. This requires changes in the attitudes and behaviors of patients and their families, and of healthcare providers. Patients need to take more active roles in decisions about their health, and providers need to relinquish control and listen to patients more carefully while exchanging ideas with each other. Patients and families of patients should be encouraged to speak about concerns and suggestions. Healthcare providers need to support the creation of learning cultures. A Canadian guide for improving patient safety through engagement, offers guidance on how to move forward on these issues (Canadian Patient Safety Institute 2017).

Increasing Workplace Civility

Workplace incivility including abusive supervision, toxic leadership, sexual harassment, bullying and rudeness seems to be on the increase in workplaces (Perrewe et al. 2015). Pearson and Porath (2005) reported that 89 percent of professionals in the US had been insulted or bullied at work and 78 percent said their organizational commitment declined as a result. Leiter et al. (2011), in a longitudinal study of 1173 healthcare workers working in 41 nursing units, had respondents complete measures of their social relationships at work, burnout, work engagement and intent to quit before and after a six-month intervention to improve civility, respect and work engagement undertaken in some units but not in other comparison units. Measures improved significantly for the intervention units, compared with the comparison units, in workplace civility, respect, job satisfaction, management trust and co-worker incivility, and absences declined.

A NECESSARY FUTURE

This collection offers a partial review of the countless and daunting occupational safety and health challenges currently facing workplaces. While some workplaces are well positioned to tackle these challenges, having developed effective occupational safety and health initiatives, most workplaces are still falling short. Research and practice have identified critical initiatives and how best to introduce them. We, as a community, need to make these a higher priority – a need this collection begins to address.

NOTE

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