

3.5.4. Substance Abuse in Occupational Settings and Safety

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To cite: Press, M., Kanani, D., & Press, S. (2017). Substance abuse in occupational settings and safety. In Chirkov, V., Anonson, J., Anderson, J., Press, M., Gerrard, A., & Ha, C. (Eds.). *Enhancing cultures of safety and safety engagement in the Saskatchewan mining industry: A collaborative and multidisciplinary inquiry* (pp. 515-522). Saskatoon, SK Canada: International Minerals Innovation Institute.

3.5.4. Substance Abuse in Occupational Settings and Safety

In this chapter, we looked at substance abuse and its relationship to safety engagement. The World Health Organization [WHO] (2016) defined substance abuse as “the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs” (p. 1). They called for policy development to reduce health problems associated with substance use (WHO, 2016). The Substance Abuse and Mental Health Services Administration (2012) reported 67.9 percent of individuals who use illegal substances or misuse alcohol are employed. One way to monitor drug and alcohol misuse in the workplace is through testing. Testing can be done pre-employment, randomly after employment, and post-accident by collecting urine samples (National Institute on Drug Abuse [NIDA], 2016). Drug testing in the workplace can reduce Workers’ Compensation Insurance costs, decrease absenteeism and accidents, and improve productivity (NIDA, 2016).

The question that guided our scoping review was: What is the influence of substance abuse on safety engagement of employees in the mining industry?

Method

A scoping review of the literature was undertaken using a formal and an informal search. The initial formal search was conducted using the following key words:

1. Industry and,
2. Substance Abuse (“Substance Abuse” OR “Alcoholism” OR “Drug Abuse” OR “Addiction” OR “Drug Addiction” OR “Alcohol Abuse” OR “Alcohol Addiction” OR “Rig Pigs”)
3. Safety Engagement (OR “risk taking behavior” OR “risk taking behaviour” OR “safety behavior” OR “safety behaviour” OR safety OR “high risk behavior” OR “high risk behaviour” OR “safety engagement” OR “safety rule violation” OR “accident proneness” OR “risk perception” OR “perception of safety” OR “safety devices” OR “workplace safety” OR “work safety” OR “risk tolerance” OR “occupational safety”)

Search Strategy. The databases searched are listed in the results. From this search, we selected articles based on the inclusion/exclusion criteria. The inclusion and exclusion criteria were kept broad in that we did not specify the types of research methods to be included or excluded in order to capture as many research articles on the topic as possible. In our search, we collected articles that were pertinent in this topic area. The broad inclusion and exclusion criteria allowed us to explore the literature in this area more completely.

Table 1. Substance Abuse in Occupational Settings and Safety: Inclusion/Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> • Articles with key terms in the title or abstract • Peer reviewed • Within 5 years • English language articles 	<ul style="list-style-type: none"> • Editorials • Commentaries • Book reviews

Screening Strategy. From the search results, we reviewed the title and abstract of each article to determine its inclusion in the scoping review. Rather than targeting the mining industry, we looked for

articles related to industry in general. We made the assumption that all industries would have the same concerns with substance abuse and safety. Those articles not applicable were excluded. The selected articles were reviewed by at least two team members for inclusion into the study.

Results

A brief summary of each article including its location, population studied, main issue addressed, comparison group, and primary outcomes is provided in Appendix A: 1.5.1 Mental Health: Substance Abuse PICO Summary for all Included Articles. Table 2 is an overview of the scope of the review.

Table 2. Substance Abuse in Occupational Settings and Safety: Databases Searched

Database	Articles were screened by title/abstract for presence of key words and applicability to topic area. The number of articles selected through this process are listed.	Abstracts were further reviewed by group and articles were selected for abstraction/summarizing, shown in articles selected for review.	Articles selected after summarizing as being applicable to the topic area are shown in the final articles for selection.
CINAHL	2	45	18
Academic Search Complete	2		
Medline	0		
Engineering Village	7		
Embase	0		
CBCA Business	0		
PsycInfo	2		
Nursing and Allied Health	0		
Web of Science	3		
ABI Inform	3		
Scopus	3		
Other topics (Ebscohost)	1		
Misc database searches	22		

Description of Included Articles. Table 3 provides an overview of the types of publications, country of publication, and populations studied.

Description of Identified Factors. Three categories of articles were identified: prevalence of substance abuse, effects on safety, and interventions.

Prevalence of substance abuse. Nine articles described the prevalence of substance abuse in the workplace. The articles discussed general statistics of alcohol and drug use, rates of alcohol and drug use in particular industries, use of drugs and alcohol in the workplace, and workplace cultures.

Table 3. Substance Abuse in Occupational Settings and Safety – Population, Country of Research, and Type of Study

Type of Publication	Country of Research	Population
Controlled trials (3)	Australia (7)	Uruguayan households (1)
Cross-sectional surveys (6)	USA (4)	Males (1)
Secondary analysis of data (4)	South Africa (1)	Safety and security workers (1)
Systematic reviews (3)	Ethiopia (1)	Carpenter and plumber apprentices (1)
Mixed methods (2)	Brazil (1)	Civilian labor force (1)
	India (1)	Construction workers (2)
	Uruguay (1)	Corporate employees (1)
	Portugal (1)	

	Norway (1)	Production workers in oil and steel industries (1) Injured workers (2) Railway workers (1) Australian households (1) Miners (1) Pilots (1)
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General statistics of alcohol and drug use. Three articles discussed the prevalence of alcohol and drug use in the population. In a secondary analysis of data from the Uruguayan household survey conducted in 2006, Balsa and French (2010) reported a positive association between heavy drinking and absenteeism, especially with women. They found 30% of those surveyed had participated in “risky” drinking in the previous 30 days, 8% had one symptom of alcohol dependence, 3% had two or more symptoms of alcohol dependence, and one-third reported at least one day absent in past 12 months with an average of nine days absent. In this report, Balsa and French found higher rates of drug and tobacco use in men as compared to women; and younger males living in a jurisdiction with high labor force participation, low unemployment, lower income per capita, only primary education, being a smoker, using illegal drugs, family member drug use, and alcohol use before the age of 16 were positively associated with risky drinking habits. In a case-control study, Kunar, Bhattacharjee, (2010) found personal factors and job-related hazards were significantly related to occupational injury depending upon the individual’s age, presence of disease, smoking, sleep disorders, regular consumption of alcohol, lack of formal education, having a large family, risk-taking behavior, and poor environmental and working conditions. In a systematic review of the literature related to alcohol use in male-dominant industries, Roche et al (2015) identified seven domains related to risky alcohol use: demographics (male, middle aged), individual (depressed, negative life events), social norms at work (permissive drinking norms), work conditions (high workloads and job stress, low collegial support), team environment (supervisory abuse), work-home interference (using alcohol to unwind after work), and structural/socioeconomic (lower socioeconomic status workers). They suggested strategies are needed for male-dominated industries that target environmental, social, and contextual factors leading to substance use and abuse.

Rates of alcohol and drug use in particular industries. Two articles look at alcohol and substance use in a specific work group. In a mixed methods study of carpenter and plumber apprentices, du Plessis, Corney, and Burnside (2013) found 65.7% of participants had harmful or hazardous drinking practices. They found 39% of the participants reported drinking alcohol two to three times per week with 17% reporting doing harm to others, 29% participant reporting verbally abusing others, and 14% engaged in racial harassment; and the qualitative data showed 66% of participants had consumed alcohol at harmful levels and had participated in violent behavior. Du Plessis et al. found a positive relationship between alcohol drinking and adverse health outcomes. The authors highlighted the need for interventions in the workplace or at colleges. In a cross-sectional study of construction workers given an alcohol and substance use screening test, Gavioli Rossi, and Oliveira (2014) found tobacco, alcohol, cannabis, cocaine, and inhalants were the most used drugs; and the risk related to the use was higher than the general population. They discussed the importance of this type of screening with standardized

instruments; and they suggested this technology was useful in the detection, early intervention, and prevention of drug use among workers. Gavioli et al. reported one of the greatest difficulties found by health professionals regarding drug use in the community consists of determining the limits which define drug abuse.

Use of alcohol and drugs in the workplace. Three studies looked at alcohol and substance abuse, and included impairment in the workplace. In a mixed methods study of the Australian construction industry, Biggs and Williamson (2012) used the Alcohol Use Disorders Identification Test (AUDIT) survey with an additional four questions and structured interviews to identify major issues and themes related to alcohol and other drug consumption. They found 78.9% reported alcohol intake in the past 30 days, 3.5% reported daily alcohol intake, and 6% had drunk alcohol at work in the prior six months. They concluded there is a need for preventative initiatives specific to this industry. In a survey study of the safety and security sector, Burnhams, Parry, Laubscher, and London (2014) found workers in physically and psychologically hazardous positions were at risk due to alcohol or drugs use; and these individuals often go to routine work with an impairment putting themselves as well as their co-workers at risk. Burnhams et al. suggested early intervention and screening in the workplace. In a national household survey in Australia, Pidd, Roche, & Buisman-Pijlman (2011) found that more than one in 20 people worked while under the influence of alcohol, and more than one in 50 people worked under the influence of drugs. The predictors of alcohol use found in this study were younger; male; certificate/diploma or less education; drinking weekly or more; using drugs; employment in the hospitality, construction, or other service industries; and being a professional or a manager.

Workplace cultures. One article discussed the effect of workplace culture on alcohol and substance abuse. In a survey study of the civil labor force, Frone (2012) found many workers are exposed to a permissive workplace and a substance use culture. The author suggested there is a need to better understand the variables that foster such workplace cultures and the impact of exposure to substances on workers who use and do not use alcohol and other substances. Frone suggested management devote attention to the workplace substance use climate within their organizations.

Effects on safety. Four articles discussed the effects of substance use on safety in the workplace. One article reported on alcohol use. In a case-controlled, survey study, Kifle et al. (2014) found workers who consumed alcohol in the workplace were less likely to use personal protective equipment and were more likely to be injured than their counterparts. As well, they found workers were more likely to consume alcohol if they perceived their work to be highly stressful. Three articles reported on drug use. In a review of the literature, Macdonald et al. (2010) found that the acute effects of smoking cannabis can last up to 4 hours, and the long-term effects can result in cognitive impairment; however, they found that smoking cannabis only affected the employees' safety at work if they smoked prior to working or during the work day. In a controlled trial, Price (2012) found a higher level of cocaine and opioid concentrations and lower levels of marijuana in the urine of post-accident coal miners compared to randomly tested miners. In a survey study of US construction firms, Olbina, Hinze, and Arduengo (2011) found a statistically significant correlation between drug usage and safety in the workplace. They discussed the use of pre-employment drug screening and random drug testing, and they stated cheating on tests is a

concern. Olbina et al found marijuana and cocaine were the most prevalent drugs used, and urine testing was the most prevalent screening tool.

Interventions. There were five articles related to interventions for alcohol and drug use. Four of the articles were related to alcohol and drug testing, and one of the articles described a theory-based intervention. Four articles looked at the effects of drug and alcohol testing on safety. Marques, Jesus, Olea, Vairinhos, and Jacinto (2014) looked at the relationship between the random testing for drugs and alcohol, and employees' accident risk in a large railway company; and they found a correlation between random testing for alcohol and drugs and the employees' reduction in accident risk. In a survey study of Australian pilots, Rudin-Brown, Mitsopoulos-Rubens, and Lenne (2012) found alcohol and drug testing reduced the use of substances in the workplace. They found the effect was greater for industry pilots than for private pilots. In a systematic review of the literature on effectiveness of drug testing in the workplace, Pidd and Roche (2014) found the majority of studies showed a correlation between drug testing and a reduction in accident/injury rates. Schofield, Alexander, Goodwin, Gerberich, and Ryan (2013) examined worker compensation claims of injured employees in small construction firms. They found those companies with drug testing programs had lower injury rates than companies without. Scholfield et al reported the results may be limited by underreporting of injuries especially if the individual had used substances.

One article described a psychological intervention. In a theory-based intervention study to reduce alcohol use, Hagger, Lonsdale, and Chatzisarantis (2011) found 281 participants allocated to a mental simulation condition consumed significantly fewer units of alcohol during the four-week follow-up period; however, they found binge drinking was not affected by the study. The researchers found changes in intentions and subjective norms predicted the number of units of alcohol consumed.

Discussion

The articles showed there is a problem with substance use affecting the safety of employees. Both substance use outside work and in the workplace may have an impact on occupational safety. As well, workplaces that are permissive or stressful tend to have more problems with substance misuse. Some companies have instituted pre-screening and random alcohol and drug testing. Testing appears to have a significant effect on reducing use of substances. Random testing helps to reduce the effects of alcohol and drug use in the workplace and appears to result in a safer workplace.

Gaps in the Literature. The majority of studies in this scoping review were quantitative studies with only two that were mixed methods. More qualitative research in this area may indicate new study areas. Most of the research used surveys or national data which is comprised of cross-sectional self-report data. It may be helpful to look at longitudinal results to determine the effects of alcohol and drug testing. Only one article reported on an intervention program in the workplace. More intervention studies may help with reducing substance use, especially psychological-based interventions of which there was very little information. Pre-screening and random substance testing appears to be effective in reducing occupational accidents. More research should be conducted in this area to determine if there is a direct link between testing and reduced injuries.

Recommendations. Substance misuse both in and outside of the workplace affects safety

engagement. The more substance abuse, the less likely a worker is to use his or her personal protective equipment. Young men appear to be at greater risk for occupational injury related to substance misuse. Based on the current scoping review, the following are recommendations for the mining industry:

- Due to the high-risk nature of mining, companies should have pre-screening, random, and post-accident drug testing policies in place when possible.
- Education on the relationship between drug or alcohol use and risk of injury should be included in safety programming.

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