The Effectiveness of Workplace Interventions to Reduce Substance Misuse

Effective Public Health Practice Project

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EPHPP Reviews and Summary Statements

To determine the effectiveness of interventions included in the Mandatory Health Programs and Services Guidelines (MHPSG), systematic reviews completed prior to 2007 were funded by the Public Health Research, Education and Development (PHRED) Program of the Public Health Branch, Ontario Ministry of Health and Public Health Services in the City Of Hamilton, Ontario, Canada.

General Standard

Equal Access

Health Hazard Investigation

New roads and human health: A systematic review	2005
Effectiveness of public health in organized response to non-natural environmental disasters *	1999
Effectiveness of environmental awareness interventions *	1999

Program, Planning and Evaluation

Psychosocial and psychological interventions for preventing postpartum depression	2005
Effectiveness of physical activity programs at worksites with respect to work-related outcomes	2005
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A meta-analysis of fear appeals: Implications for effective public health campaigns	2001
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Chronic Disease and Injuries

Chronic Disease Prevention

What is the effectiveness of community-based/primary care intervention in reducing obesity among adults in the general population?	2008
Is there a relationship between food insecurity and overweight/obesity?*	2007

The effectiveness of multi-faceted health promotion interventions in the workplace to reduce chronic disease*	2007
The effectiveness of intervention to promote physical activity among marginalized populations*	2007
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Enhancing partner support to improve smoking cessation	2006
Group behaviour therapy programmes for smoking cessation	2006
Individual behavioural counselling for smoking cessation	2006
A review of interventions to reduce tobacco use in colleges and universities	2006
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Workplace interventions for smoking cessation	2006
Exercise for health for early postmenopausal women: A systematic review of randomized controlled trials	2006
Home versus center based physical activity programs in older adults	2006
Interventions for promoting physical activity	2006
The effectiveness of school-based interventions in reducing adolescent risk behaviours: A systematic review of reviews*	2005
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Dietary advice given by a dietitian versus other health professionals or self-help resources to reduce blood cholesterol	2005
A review of 25 long-term adolescent tobacco and other drug use prevention program evaluations	2005
Counselling to promote a healthy diet in adults: A summary of evidence for the US Preventive Services Task Force	2005
Reviews of evidence on interventions to prevent dental caries, oral and pharyngeal cancers, and sports-related craniofacial injuries	2005
Systematic review of long-term effects of advice to reduce dietary salt in adults	2005
Effectiveness of physical activity enhancement and obesity prevention programs in children and youth (Healthy Weights Review (HWR))*; comprised of the following five reviews: Environmental interventions to improve nutrition and increase physical in children and youth Interventions to improve nutritional intake in children and youth Interventions to increase physical activity and nutritional intake in children and youth Interventions to increase physical activity in children and youth Interventions to reduce physical inactivity in children and youth	2004
Effectiveness of worksite physical activity programs on physical activity, physical fitness and health	2004
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The effectiveness of routinely taught breast self-examination in reducing mortality	2003
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The effect of exercise training on bone mass among pre- and postmenopausal women	2001
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The effectiveness of school-based interventions in promoting physical activity and fitness among children and youth: A systematic review *	2001
Effectiveness of dust mite control to reduce asthma symptoms	2000
The effectiveness of interventions for preventing tobacco smoke in public places	2000
Effectiveness of a telephone intervention as a delivery strategy within the scope of public health nursing practice	2000
The effectiveness of postpartum smoking relapse prevention strategies: A systematic review of the evidence 1992-1999*	2000
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Effectiveness of coalitions in heart health promotion, tobacco use reduction, and injury prevention: a systematic review of the literature 1990-1998 *	1999
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The effectiveness of community-based heart health programs: a systematic overview update *	1999
The effectiveness of workplace-based health risk appraisal in improving knowledge, attitudes or behaviours	1999

Early Detection of Cancer

The effectiveness of interventions to promote mammography among women with historically lower rates of screening	2005
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Community-based strategies to promote cervical cancer screening *	2000

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Workplace interventions to prevent substance misuse	2008
Home visits during pregnancy and after birth for women with an alcohol or drug problem	2006
Non-legislative interventions for the promotion of cycle helmet wearing by children	2006
Interventions for promoting booster seat use in four to eight year olds travelling in motor vehicles	2006
Population-based interventions for the prevention of fall-related injuries in older people	2006
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A systematic review of the effectiveness of the community reinforcement approach in alcohol, cocaine and opioid addiction	2005

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Sexual Health

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The effectiveness of the health promoting schools approach and school-based health promotion interventions	2001
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The effectiveness of postpartum smoking relapse prevention strategies: A systematic review of the evidence 1992-1999*	2000
Smoking cessation during pregnancy	1999
The effectiveness of home visiting as a delivery strategy for public health nursing interventions to clients in prenatal and postnatal period: A systematic review *	1999

Child Health

The effectiveness of early childhood home visitation in preventing violence: a systematic review	2006
The effectiveness of school-based interventions in reducing adolescent risk behaviours: A systematic review of reviews*	2005
Reviews of evidence on interventions to prevent dental caries, oral and pharyngeal cancers, and sports-related craniofacial injuries	2005
Social deprivation and the prevention of unintentional injury in childhood. A systematic review	2005
Optimal duration of exclusive breastfeeding	2002
Community-based interventions to improve child mental health: review of reviews*	2002
The effectiveness of school social work from a risk and resilience perspective	2002
The effectiveness of school-based violence prevention programs for children at risk	2002
The effectiveness of public health interventions to reduce or prevent spousal abuse toward women *	2001
The effectiveness of the health promoting schools approach and school-based health promotion interventions	2001
Support for breastfeeding mothers	2001
Effectiveness of pre-school screening for hearing, speech, language and vision	2001
Antenatal education for childbirth/parenthood	2001
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The effectiveness of home visiting as a delivery strategy for public health nursing interventions to clients in prenatal and postnatal period: A systematic review *	1999
The effectiveness of school-based curriculum suicide prevention programs for adolescents *	1999

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Bioterrorism Preparedness	2003
The effectiveness of needle exchange programs in modifying HIV-Related outcomes: A systematic review of the evidence 1997-1999*	2000

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The effectiveness of needle exchange programs in modifying HIV-Related outcomes: A systematic review of the evidence 1997-1999*	1999
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* *Indicates a review completed by the Effective Public Health Practice Project. Completed reviews and summary statements are added to our web site as they become available. Please check http://www.hamilton.ca/ephpp regularly for new or updated information.*

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Preface

The Public Health Branch of the Ontario Ministry of Health released the Mandatory Health Programs and Services Guidelines (MHPSG) in December 1997. Although the MHPSG provide guidelines for a wide range of public health practices in Ontario, the strength of evidence for many of the guidelines has not been summarized in a systematic way.

The Effective Public Health Practice Project (EPHPP) develops and provides systematic reviews of the effectiveness of specific requirements of the MHPSG. Each review is linked to one of the three general standards or three program standards. The reviews summarize the best available research evidence for public health practice in these areas. Research evidence is one piece of information needed to inform decision making in public health. Other factors, such as the local environment, local priorities, and available resources are also important.

The reviews are conducted by review groups composed of members of the Ontario PHRED Program health units as well as representatives from other health units around the province.

Potential review topics are initially identified through a survey of public health practitioners and managers across Ontario. Each review group follows a systematic approach that includes comprehensive search strategies and quality assessment of each primary research study selected for inclusion in the review.

One of the primary objectives of EPHPP is to ensure that the information is relevant to public health practitioners in the field. We contact Medical Officers of Health, Program Managers and others to ask for volunteer experts to take on the role of peer reviewers for the draft reports.

The EPHPP project has many benefits. Public Health professionals develop skills in conducting systematic reviews and increase their awareness of the importance and feasibility of evidence-based practice. Through this project, we established new links with the Cochrane Collaboration. Reviews are in the process of being registered with the various Cochrane Review Groups, making the reviews accessible to the international public health community. Finally, by providing education, support and a collegial atmosphere in which to expand and share public health research, The EPHPP has contributed to the development of a strong province-wide network of public health professionals.

Effective Public Health Practice Project Summary Statement

This is a summary statement written to condense the work of the authors of a systematic review. The reference for the full review is below. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

Reference: Fitzpatrick-Lewis, D.J.; Thomas, H.; Washik, K. (2008) The effectiveness of interventions in the workplace to reduce substance misuse (alcohol and drugs). Effective Public Health Practice Project, McMaster University, Hamilton, Ontario.

Issue: An important goal of public health is to reduce the severity and impact of preventable injuries and of substance misuse (Ontario Public Health Standards, 2007). The use of alcohol has been linked to a number of chronic diseases including: cardiovascular disease, some cancers, gastrointestinal conditions, psychiatric disorders, injuries and/or death through vehicle collisions or self-harm and many anti-social behaviours (Babor et al., 2003). As well, alcohol use has negative impacts on/in the workplace. Empirical evidence points to an association between alcohol and work related problems, however, the direction and nature of causality is less clear (Rehm and Rossow, 2001). Alcohol use is a contributing factor in some workplace accidents, absenteeism, attrition, disciplinary problems, theft, poor morale and lower productivity (Babor et al., 2003). Bennett and Lehman (1998) identified that alcohol misuse in the workplace causes approximately 40% of co-workers to experience at least one negative consequence in association with a person's substance misuse.

Statistics also indicate that illegal drug misuse among Canadians increased between 1992 and 2002 (Rehm, J. et. al., 2006, CCSA). The Canadian Centre on Substance Abuse found that of the $39.8 billion total social cost of substance misuse, the harm created by illegal drug use accounted for $8.2 billion (20.7%). 'Social cost' refers to indirect costs (such as productivity loss), direct health care costs, law enforcement costs and other direct costs related to substance misuse among Canadians.

Workplaces seeking to address health and safety concerns may benefit from a review looking at the question of effectiveness of interventions in the workplace in reducing substance misuse.

Review Content Summary: To be considered relevant studies had to meet all of the following criteria: the intervention described could be implemented, facilitated or promoted by staff in local public health units in Canada, the study population was adults in the workplace, the reported study outcome(s) included behaviour change in regard to substance use and the primary study design was prospective and included a control group. Potentially relevant articles (n=261) were retrieved. Of these, 16 relevant articles were quality assessed. Methodologically, zero articles rated strong, eight rated moderate, and eight were weak. Data were extracted from the moderate studies and were synthesized in a narrative format. Seven of eight included studies were RCTs.

Comments on this review's methodology: Six databases were searched for the period 1990-2007 to locate relevant primary studies. Peer review journals were hand-searched for the period January to September 2007. Reference lists of all retrieved articles were searched for relevant studies. Primary studies were assessed for relevance and methodological quality using standardized tools. Two reviewers rated each article independently. Differences were resolved through discussion. Data were extracted from the methodologically moderate studies using a standardized instrument. A narrative synthesis was presented.

Evidence and implications for practice and policy

Evidence points ARE NOT weighted or ranked according to strength.

Evidence	Implications
Two studies showed an increased desire to reduce substance misuse behaviour.	Program development based on the transtheoretical model of behaviour change should be incorporated.
One study with an educational component increased awareness of workplace substance use/misuse policies.	Workplace policies to address substance misuse need to be clear and specific. Employees need to be oriented/educated on workplace policies that address substance misuse.
"Team Awareness" which combined interactive activities such as role playing with a didactic approach was more effective at producing positive results than educational sessions alone.	Intervention/program development should utilize adult education principles.
Included studies were implemented in the United States, France, Japan and Australia.	There is a need for research that is specific to the Canadian workplace and health system.
Interventions pointed to some promising practice, however, they should be viewed with caution due to the methodological issues within the primary studies.	Research in this area needs have greater methodological rigour.
Promising interventions were brief interventions with short follow-up period.	Those interventions need to be implemented for longer and sustained time periods with longer follow-up. Funders can support this type of research by reformulating the funding protocols that would allow for long-term follow-up; perhaps up to 10 years.
General Implications: There are some interventions that show promising results, however, those are based on short-term outcome measures of reduced alcohol consumption. Much of the social harm and economic cost of substance misuse is caused by moderate users who engage in risky behaviours. Public health can play a substantive role in the development of policies around substance misuse and in strong social marketing campaigns to raise awareness within the general population.	

Cost Benefit or Cost-Effectiveness Information: no information available

References Used to Outline Issue:

Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Gruenewald, P., Hill, L., Holder, H., Homel, R., Österberg, E., Rehm, J., Room, R., Rossow, I. (2003) Alcohol: No ordinary commodity. New York: Oxford Medical Publications.

Bennett, J.B. and Lehman, W.E.K. (1998) Workplace drinking climate, stress and problem indicators: Assessing the influence of teamwork (group cohesion). Journal of Studies in Alcohol, 59 (5), pp. 608-619.

Ontario Public Health Standards, 2007

Rehm, J. and Rossow, I. (2001) The impact of alcohol consumption on work and education. In: Geml, G. and Klingeman, H. (eds) Mapping the social consequences of alcohol consumption, pp. 67-77. Dordrecht: Kluwer Academic Publishers.

Weeks, J., Rehm, J., and Mugford, R. (2007) Prescription drug abuse FAQs. Canadian Centre on Substance Abuse. www.ccsa.ca/CCSA/EN/Publications/. Downloaded 02/03/2008.

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ABSTRACT

Objectives

The objective of this review was to answer the following question:

What is the effectiveness of workplace interventions in reducing substance (alcohol and drug) misuse?

Methods

The Cochrane Collaboration Review Guidelines (2006) were used to guide the search strategy for this review. Electronic databases were searched from 1990 to 2007. Additional journals were hand-searched. Articles were reviewed independently by two reviewers using standardized tools that rated articles for relevance and methodological quality. Data was extracted and synthesized in a narrative format.

Results

From our initial search, EPHPP staff examined each article abstract and found 261 articles that were seen to be potentially relevant. Sixteen articles passed the relevance testing and were included in the quality assessment phase. None of the articles were found to be methodologically strong. The eight articles with a "moderate" rating were included for data extraction. Data was not extracted from the articles with a "weak" rating. The included studies sought to reduce alcohol and other substance misuse among workers, to increase a desire to reduce drinking/other substance use, to improve work climate/ health attitudes or a combination of the three. Five of the studies reported statistically significant differences in regards to the effectiveness of workplace interventions regarding some of the above-mentioned objectives. However these measurements are of short-term outcomes that do not adequately capture long-term behaviour change.

Conclusion

There were several limitations seen within the studies included in this review, including small sample sizes, high attrition rates and the fact that seven of the above-mentioned interventions were completed within short-term time frames (brief interventions of one or two sessions). All the included studies had interventions that were short term with short term follow-up (2 to 18 months). Three studies included interventions that resulted in an increased desire to reduce substance use and/or additional awareness of workplace policies related to substance misuse. While that outcome was not a primary focus of this review, these studies may prove insightful especially when program development is located within a transtheoretical model. Interventions that show promise need to be replicated in Canadian work settings. Future research should focus on interventions that are more intensive with longer duration for implementation and follow-up.

Introduction

An important public health goal is "to reduce the frequency, severity and impact of preventable injuries and of substance misuse" (Ontario Public Health Agency, 2007). An objective within this goal is to build and sustain behaviour change by the public that contributes to the prevention of injury and substance misuse and increases the proportion of the public who have access to safe and supportive environments. Public health should also be seeking effective ways to reduce the incidence and severity of substance misuse and substance-related injuries, hospitalizations, disabilities and deaths (Ibid).

Research has linked substance use to chronic and acute diseases, even in people who do not have long-standing or so called 'drinking problems' (Giesbrecht, Room, Demers, Lindquist, et al., 2006). The use of alcohol has been related to cardiovascular disease, some cancers, gastrointestinal conditions, psychiatric disorders, injuries and/or death through vehicular crashes or self-harm and many anti-social behaviours (Babor, Caetano, Casswell, Edwards, et al., 2003). As well, alcohol use has negative impacts on/in the workplace. Empirical evidence points to an association between alcohol and work related problems, however, the direction and nature of causality is less clear (Rehm & Rossow, 2001). Alcohol use is a contributing factor in some workplace accidents, absenteeism, attrition, disciplinary problems, theft, poor morale and lower productivity (Babor et al., 2003). Bennett & Lehman (1998) identified that alcohol misuse in the workplace causes approximately 40% of co-workers to experience at least one negative consequence in association with a person's substance misuse.

According to the Canadian Addictions Survey, the prevalence of alcohol use by Canadians increased in the decade between 1994 and 2004, from 72% in 1994 to 79% in 2004. Of the 79% of Canadians who consume alcohol, 18% exceeded the Centre for Addiction and Mental Health Low-Risk Drinking Guidelines[1] (2004). Within the Canadian population, males aged 18-24 and those who identified as single were the most likely to exceed the low-risk drinking guidelines. The survey results showed that approximately 25% of Canadians, occasionally to frequently, use alcohol in a manner that increases the risk of acute or chronic complications. In Canada, approximately 10% of the adult population are thought to have problem drinking (Prevention Source BC, 2001); however negative impacts to self, family and society also occur in moderate drinkers who engage in risky behaviours such as drinking and driving. Incidents of social harm or injury from a single intoxication are higher for infrequent drinkers compared to high risk or heavy drinkers (Hurst, Harte, & Firth, 1994).

The use of alcohol, while having a significant positive economic impact through employment and taxation revenue, also has a substantial economic cost. For instance, in 2002, the cost of alcohol related harm was $14.6 billion or approximately $463 for every living Canadian (Rehm, Baliunas, Brochu, Fischer, et al.). Within this figure, alcohol use costs Canadians $7.1 billion in lost productivity, due to either illness or death. The second highest figure was direct health care costs, reported at $3.3 billion with an additional $3.1 billion spent on law enforcement (Ibid).

Statistics also indicate that illegal drug misuse among Canadians increased between 1992 and 2002 (Rehm, Baliunas, Brochu, Fischer, et al., 2006). The Canadian Centre on Substance Abuse found that of the $39.8

[1] Key recommendations in these guidelines for maintaining low risk for alcohol related problems include: zero drinks for lowest risk; no more than 2 drinks on any one day; and a maximum of 9 drinks per week for women and 14 drinks per week for men. Measurements are based on standard drink sizes of 12 oz. of beer, 5 oz. of wine or 1.5 oz. of spirits.

billion total social cost of substance misuse, the harm created by illegal drug use accounted for 20.7% or $8.2 billion. 'Social cost' refers to indirect costs (such as productivity loss), direct health care costs, law enforcement costs and other direct costs related to substance misuse among Canadians. In their 2002 study focusing on illegal drug use (namely cannabis, cocaine/crack, opioids and other injection drugs) the CCSA found that, a total of 1,695 persons died as a result of illegal drug use in the decade covered within the survey. While the number of illegal drug-related deaths is lower than those caused by alcohol misuse, the study found that younger people in particular are more at risk to die from drug misuse, and notes that "the impact is significant in terms of years of life lost" (Ibid). It is estimated that on average each of the 1,695 individuals in the above figure lost 36 years of productive life as a result of a drug related death (Ibid).

There is little Canadian research on prescription substance misuse. According to the International Narcotics Control Board (2004), Canadians have some of the highest rates of use of prescription narcotics world-wide. In examining the reasons for admission into detoxification and other drug treatment programs, it has been found that prescription drug misuse accounted for 11% in Ontario in the year between 1999 and 2000 alone (Rush, 2002). There is no significant Canadian research that indicates a risk of prescription drug misuse; however, research from the United States shows a rising trend. Among the young adults (ages 18-25) who completed the 2004 National Survey on Drug Use and Health, surveyors found that non-medical prescription pain reliever misuse rose steadily, from 22.1% in 2002, to 23.7% in 2003 and 24.3% in 2004 (Substance Abuse and Mental Health Services Administration, 2005).

Workplaces are perceived as ideal locations to reach a large proportion of the adult population. In addition, workplaces are increasingly addressing health and safety issues through policy development. This readiness for health and wellness can create an ideal climate for public health to fulfill its mandate to raise awareness and create and sustain behaviour change.

Finding literature that supports effective interventions in the workplace to address alcohol misuse has been mostly unsuccessful. A review of the literature examining alcohol-related interventions in the workplace (Roman & Blum, 1996), found that the overall methodological quality of the papers reviewed was weak. While the interventions had evidence suggestive of being effective, more rigorous research was called for by the authors. A similar problem existed in a literature review conducted a decade earlier (Kurtz, Googins, & Howard, 1984) which found that the effectiveness of the interventions was not able to be adequately measured due to problematic research design. A timely and relevant systematic review of the effectiveness of workplace interventions in reducing substance misuse will be helpful to inform practice, policy and research.

Research Question

This review examines the following question:

What is the effectiveness of workplace interventions in reducing substance (alcohol and drug) misuse?

Methods

Primary studies were reviewed.

Searching the Literature

The electronic literature search strategy is detailed in Table 1. Six databases were searched including: Cinahl, Embase, Medline, Healthstar (Ovid), PsychInfo and Sociological Abstracts for the period of January 1990 to July 2007. Government agency websites within Canada, as well as countries with workplace practices and standards similar to those in Ontario, were searched to locate grey literature. Key informants provided links to unpublished literature in these areas and websites in Canada, the United States, Europe and Australia were searched for relevant publications.

The Effective Public Health Practice Project (EPHPP) ensures a high level of methodological rigour in our systematic reviews. Our process includes recruiting review group members who help review the research, are content experts and act as peer reviewers of the draft systematic review.

Hand-searching of relevant peer-reviewed journals (n=12) was conducted for the period of January 2007 to August 2007 (see Appendix 2 for the journals that were hand-searched). Relevant articles were retrieved and added to the database. The reference lists of retrieved articles were examined for potential additional relevant references.

Two reviewers independently scanned the citations and abstracts for relevant articles. All citations selected by either reviewer were captured into Reference Manager (Version 11). All potential relevant citations were retrieved.

Relevance

To be included, studies had to meet all of the following criteria (Appendix 3):

- ✓ The intervention described could be facilitated, implemented or promoted by public health.
- ✓ The study reports on an intervention targeted at changing behaviour (therapies, strategies, counselling, education, skill building, or supportive environment) in the workplace relating to substance misuse (alcohol or drugs). Tobacco is not relevant to this review.
- ✓ The study implements the intervention in a population of adults in the workplace.
- ✓ The intervention takes place in countries where workplace practices and standards are similar to those in Ontario.
- ✓ The study outcomes are behaviours related to reduction of substance misuse (reduction, elimination, abstinence, “early identification”, “self-management”, relapse prevention and/or rehabilitation).
- ✓ The study design is prospective and includes a control group (one group pre/post design are not acceptable).

Employee Assistance Programs (EAP) were excluded from relevance if there was an inpatient treatment as one of the intervention strategies. While EAP's can be an important part of the management of substance misuse in the workplace it was felt that inpatient treatment was not an intervention relevant to public health.

Two reviewers independently rated all retrieved articles for relevance. Differences were resolved through consensus. Articles that passed relevance testing moved into the quality assessment phase.

Quality Assessment

The Effective Public Health Practice Project has developed and tested a tool for assessing the methodological quality of primary studies in public health (Thomas, Ciliska, Dobbins, & Micucci, 2004). The tool is based on guidelines set out by Mulrow, Cook, & Davidoff, 1997 and Jadad, Moore, Carroll, Jenkinson, et al., 1996. It has been examined by experts in the field and has received excellent ratings (Deeks, Dinnes, D'Amico, Sowden, et al., 2003). This tool consists of six criteria:

- Selection bias
- Allocation bias
- Confounders
- Blinding of outcome assessors
- Data collection methods
- Withdrawals and dropouts

The six criteria were each rated as "strong", "moderate" or "weak" depending on characteristics of each criterion reported in the study. The dictionary outlining the criteria for ratings is available at www.hamilton.ca/ephpp, (See Appendix 4 for the quality assessment tool). The ratings of criteria were totalled; each study then received an overall assessment of strong, moderate, or weak quality. In order for a study to be rated as "strong", four of the six quality assessment criteria had to be rated as strong, with no weak ratings. A rating of "moderate" was achieved if less than four criteria were rated strong and one criterion was rated weak. A rating of weak was given if two or more criteria rated weak. Two reviewers independently scored all relevant articles for quality. Differences in scoring were resolved by discussion.

Data Extraction

It is EPHPP's preference to complete data extraction primarily from articles that rate "strong" in the quality assessment. In the absence of methodologically strong articles data in this review were extracted from "moderate" articles. The data are reported in a narrative format that includes information on the study design, the intervention and the outcomes. The theoretical framework upon which interventions were based was collected to determine whether any framework impacted the effectiveness of interventions and which framework(s) showed the most promise. The sources of funding for the study were also provided when that information was disclosed in the article. All statistically significant and non-significant outcomes that were considered to be relevant to the review question were reported.

Results

Appendix 2 outlines the number of articles involved in this review. The search for published and unpublished studies resulted in the identification of potentially relevant articles. Fourteen hundred and twenty six articles were retrieved. These titles and abstracts were scrutinized by EPHPP staff and 261 articles were determined to be potentially relevant for review. Those articles were retrieved and reviewed by internal and external relevance reviewers. Of those 261 articles, sixteen were passed by reviewers into the quality assessment phase.

Quality Assessment of the Relevant Studies

Table 2 outlines the results of the quality assessment outcomes of the 16 relevant articles. Eight articles were rated as "moderate" by the quality assessors and eight were rated as "weak"; there were no articles that were rated as "strong". Many of the articles (50%) rated weak on the selection bias while the remaining 50% rated moderate. There were two problems that led to those rankings: many (75%) of the studies did not report the number of individuals who were eligible to participate and a large number (62.5%) reported very low numbers of eligible individuals who agreed to participate in the study. Most (59%) of the articles were randomized controlled trials. The remainder were clinical control trials (17%) and cohort studies (24%). In twenty-five percent of the studies confounders were not well controlled. Only 31% of the articles ranked "strong" for blinding. In the remaining studies the blinding process was either not explained; the outcome assessors were aware of the exposure status of the participant; or the participants were aware of the research question. Reliable and valid outcome measures were used in most (69%) of the studies. Another area of methodological weakness was in withdrawal/dropout rates. Fifty percent of studies had high rates of participant withdrawal/drop-out (more than 40%) or those numbers were not reported. No studies reported a sample-size calculation. Many of the studies had small sample sizes so it is likely they had inadequate statistical power to detect between group differences, even if they were present. The statistical analysis in most studies was appropriate and used intention-to-treat analysis.

Integrity of the intervention is an important part of program delivery. It can explain why no between group differences were found. If few participants received the program, it will not be surprising that there were no between group differences. This is an implementation problem rather than an intervention problem. Among the studies in this report 30% of studies reported that >80% of participants received the intervention and 13% reported that 60-79% received the intervention. Unfortunately, another 13% of the studies reported that <60% of participants received the intervention while the remaining 44% of studies did not report this information at all. Another implementation issue relates to the consistency of the intervention (i.e. did all groups/individuals receive the same intervention). Only 12% of studies indicated that the consistency of the intervention was measured and was satisfactory. In the remaining studies, the consistency of the intervention was either not measured or not reported.

Of the studies rated moderate, and therefore included in the remainder of the discussion, most were carried out in the United States (n=5). One study was completed in Japan; one in France; and one study in Australia. There were no studies from Canadian investigators. All the studies were undertaken with adults (18-65 years) in the workplace. Five of eight studies took place within the manufacturing/industrial sector (Anderson & Larimer, 2002; Araki, Hashimoto, Kono, Matsuki, & Yano, 2006; Cook, Back, & Trudeau, 1996b; Lang, Nicaud, Darne, & Rueff, 1995; Stoltzfus & Benson, 1994). One study focused on municipal workers

(Bennett, Patterson, Reynolds, Wiitala, et al., 2004); another on healthcare professionals (Lapham, Gregory, & McMillan, 2003); and one study examined interventions implemented within a police department (Richmond, Kehoe, Hailstone, Wodak, et al., 1999).

Results of Moderate Studies

This section provides some discussion about the studies with moderate ratings of methodological quality (n=8).

Anderson & Larimer (2002) reported on a brief intervention using motivational interviewing style to provide individual feedback based on participant's response on a baseline assessment of alcohol use, attitudes and behaviours. Participants were drawn from a mid-sized company in the food industry located in the United States. The goal of the study was to reduce problem drinking rates (problem drinkers referred to those who identified one or more alcohol-related negative consequence at baseline) and negative consequences related to alcohol use and misuse for those who identified this as an issue, and to promote moderate drinking among all participants. Participants met privately with trained feedback providers for a one-time 30-60 minute session. Those who chose not to meet for a feedback session were mailed the information. Sessions consisted of the feedback information, alcohol education and skills training. Female problem drinkers were more likely than male problem drinkers to benefit from the intervention in terms of reporting a more significant decrease in negative consequences at the six-month follow-up. Using multivariate analysis there was a significant Treatment Condition X Time interaction, $F(1, 78) = 5.95$, $p<.02$, with participants (both genders) in the intervention group reducing their overall consumption rates significantly more than those in the control group.

Araki et al. (2006) compared the effectiveness of traditional face-to-face health education or e-mail health education with a control group delivered to Japanese men working in the manufacturing sector. The face-to-face intervention consisted of two 30-minute health education sessions delivered over two months. Participants received an educational lecture and brochure and participated in individual goal setting. A counsellor was available to talk to participants outside of the scheduled sessions. E-mail participants received the same educational information, brochure and goal setting however the means of communication was via e-mail. There was a significant increase in knowledge ($p<0.001$), attitude ($p<0.05$) and behaviour change ($p<0.01$) in the face-to-face group. In the email group there was a marginally significant reduction in alcohol consumption ($p=0.077$). There was no change in the control group.

Bennett et al. (2004) examined the effectiveness of a classroom health promotion training designed to improve work climate and alcohol outcomes and to assess whether this training contributed to improvements in problem drinking beyond standard workplace alcohol policies. This study was conducted with a group of workers in a large American municipality. Problem drinking was assessed on the answers to the following indicators: (a) drinking in the morning, (b) shakes and tremors because of the need to drink, (c) drinking more than intended, (d) staying drunk for a day or longer, and (e) blackouts. The experiment consisted of five phases: (1) preliminary focus groups and interviews at four months pre-test; (2) random assignment and pre-test survey at two to four weeks before training; (3) training; (4) post-test survey two to four weeks following training; and (5) six-month follow-up. The intervention, called Team Awareness, was psychosocial training consisting of lecture, discussion, interactive group work, video, role plays and communication skill building. The second group received enhanced informational training at which employees received two hours of information about substance misuse and workplace policy. Two weeks

later employees received a two-hour information session about their EAP and services provided. The Team Awareness group showed a reduction in problem drinking from 20% to 11% and working with or missing work because of a hangover from 16% to 6%. The information-trained group also reduced problem drinking from 18% to 10%. Control subjects showed no change at 13%. Overall differences between the informational group and either the Team Awareness or control group were not statistically significant.

Cook et al. (1996a) conducted a randomized controlled trial to field test an intervention aimed at the reduction of alcohol and drug misuse and the improvement of overall health behaviours and attitudes. This study was conducted in a manufacturing facility in the United States. The intervention program entitled "SAY YES! Healthy Choices for Feeling Good" consisted of three to four classroom sessions with an accompanying multi-segment video and booklet for participants. The program was delivered by a trainer in three sessions over three weeks. The no-treatment control received the intervention after it had been completed by the intervention group. The central concepts of the program were healthy lifestyles and well-being, personal choices and lifestyle, and the impact of alcohol and drug use on health and well-being. No between group differences were noted on drinking outcomes. Reported drug use was rare and those who indicated drug use in the 30 days prior to assessment was low (4%). Because of this low frequency these data were not further analyzed.

The Lang et al. (1995) study objective was the improvement of blood pressure control among hypertensive (>140/90mmHg) excessive alcohol drinkers in France, with alcohol consumption being a secondary measurement. Physicians from fourteen worksites were randomized into intervention or control groups. A total of 15,310 workers were screened by the fourteen physicians, 129 of these were included in the study. The eligibility criterion for the participants was fulfillment of both conditions – identification as hypertensive and an excessive consumer of alcohol. The intervention (n=67) consisted of training the worksite physicians, with follow-up for identified participants. Follow-up was based on self monitoring of alcohol consumption. At the one-year point, alcohol consumption was greater in the intervention group than the control group ($p<0.1$). At two years, there was no significant difference observed.

Lapham et al. (2003) examined the effects of enhanced substance misuse prevention on binge drinking and the desire to reduce alcohol use among a group of healthcare professionals in the United States. The intervention utilized relatively low-cost components such as substance misuse awareness training for managers, the use of health risk appraisals (HRA) and educational videos on stress reduction, depression and binge drinking. Outcome measures were the reduction on binge drinking occurrences (defined as 5 or more drinks per occasion in the 30 days prior to assessment) and the desire to reduce alcohol consumption. Actual drinking outcomes were not impacted by the intervention, however, those who completed the HRA at the intervention site in the post-intervention period were 2.59 times more likely to report a desire to reduce consumption compared with the pre-intervention period and with both time periods in the comparison group ($p<0.05$).

Richmond et al. (1999) reported on an evaluation of the effectiveness of a brief intervention to reduce excessive drinking, smoking and stress among police in Australia. The intervention, entitled "Drinking Detectives" was based on motivational interviewing principles and consisted of advice on drinking including the pros and cons of excessive drinking; the health effects of excessive alcohol consumption; comparison of personal drinking levels with the Australian norms; and hints for cutting down on drinking. All intervention participants received a Drinking Detective kit consisting of a booklet and an audio recording of a radio play set in the workplace. Alcohol consumption, particularly among men, was high at baseline

and follow-up assessments. Comparisons between groups across occasions showed no significant intervention effects. There was a significant increase ($p<0.01$) in awareness of alcohol policies in the workplace in both the experimental and control groups over time.

Stoltzfus and Benson (1994) examined the use of multiple and interactive strategies aimed at altering workplace culture and promoting employee "ownership" of substance misuse programs in a large manufacturing worksite in the United States. Employees were asked to examine, through an interactive process, their attitudes, behaviours and decisions around drug and alcohol consumption. The core components of the intervention were: ten hours of training for all supervisory staff; a two hour session for all staff to discuss corporate policies regarding substance use in the workplace; and a peer helper program. Outcome variables included: reduction in four measures of alcohol use; reduction in drinking and driving; and a reduction in riding with a driver who is under the influence of alcohol or drugs. Outcome measures of meaningful change, decided in collaboration with corporate officials, were a five percent (or more) change in a positive direction. Only the intervention group showed changes that met this five percent criterion. On two measures of substance use no evidence of reduction was seen in either the experimental or control group. There was no between group difference.

Discussion

All the included studies had outcome measurement of alcohol use. Two of those studies also incorporated drug misuse in their measurements. In Stoltzfus and Benson (1994) there was no evidence of drug use behaviour change in either the intervention or control groups. The authors suggest this was due to low numbers of participants identifying that behaviour at pre-test. Similarly Cook et al. (1996b) had such low numbers of persons identifying as having used drugs in the 30 days prior to the pre-test, they did not have enough data to analyse. These studies may indicate that drug use is actually infrequent among the groups in which it was measured, or people chose not to report it (in spite of assurance of anonymity) given the potential consequences.

All but one study reported the use of self-report instruments for the measurement of substance use. There has been some debate regarding the validity/reliability of self-reported data especially in regards to a potential social desirability bias. We felt that self-reported data can be considered valid and reliable in these studies because the investigators administered these surveys to ensure anonymity and confidentiality. As well, the participants answered the surveys after being reassured by the investigators that their answers would not be used against them with their employer. However, some of the studies reported that the intended participants (high risk or binge drinkers or drug misusers) were under represented in their sample. This may indicate a volunteer bias in which only those who were already motivated to change their behaviour agreed to participate in the research.

Some of the studies were limited by small sample sizes or high attrition rates. Small sample size can limit the measurement of effect as well as the generalizability of interventions. Therefore, results from these studies need to be regarded with caution. High attrition rates have the potential to skew results either positively or negatively. In these studies, it is possible that those who dropped out did so because they did not wish to change their drinking habits, resulting in positive overall study results that are erroneous.

As reported above, the outcome measurements for drug misuse either showed no change or were not analysed due to low numbers of participants. The outcome measurements for alcohol consumption tended

to be modest especially in terms of behaviour change. Significant change appeared to occur in the area of motivation to change or attitude about behaviour. As these motivational/attitudinal changes often precede actual behaviour change these interventions may point to areas for further study. Modest behaviour changes measured immediately following the intervention were not maintained to the follow-up period. Two studies reported a gender difference in outcome measurements with females showing a significant change in risky drinking behaviours over the male participants.

Most of the interventions were brief one or two sessions that may have lacked the intensity needed for long-term impact on behavioural changes. Many of the included studies had short post-test timeframes. These ranged from two months, six months, and eight months. While these follow-up periods were sufficient to measure short-term behaviour changes they are insufficient to measure long-term outcomes. Studies with longer post-test follow-up showed no significant positive behavioural changes.

None of the included studies were conducted within a Canadian workplace. The outcomes of the included studies may not be generalizable to the Canadian context due to national labour practices and/or service delivery models. For instance, in the United States mandatory drug testing is a common practice in the employment sector, a practice that is less prevalent in Canada.

Studies that had an inpatient component of the intervention are not part of our included studies; however, we felt it important to incorporate in the discussion some thoughts on EAP programs. EAP programs are often used in the workforce as a component of care for employees with substance misuse problems. Many EAPs are provided by private organizations whose practices may not fall under the umbrella of public health; however, there can be a role for public health practitioners and policy makers in developing and providing evidence informed practice models. As well, public health can work collaboratively with community agencies to build effective instruments and practices to help persons with supervisory positions in the workplace to understand the impact of substance misuse; to identify the signs and symptoms of misuse in the workplace; and, to help build private and the public policies to address these issues that benefit the employee, the workplace and larger society.

As mentioned in the introduction, there have been reviews conducted in the past that examined the effectiveness of interventions in the workplace to reduce alcohol misuse. The authors of those reviews suggested that the effectiveness of the interventions may have been promising. However, the quality of those interventions was not easily measured due to the methodological shortcomings of the included studies. Now, more than two decades after the first review, those methodological shortcomings still persist.

Conclusions

Implications for Practice

Public health practitioners can work closely with workplaces, especially in the area of occupational health and safety; occupational health nurses; or human resources specialists to provide information on the impact of substance misuse and provide training to supervisors to recognise the signs and symptoms of substance misuse.

There are some promising practices but those would need longer implementation and follow-up time in order to gauge measurable long-term behaviour change.

Brief interventions may need to be longer and enhanced in order to see more measurable and positive outcomes.

Some interventions showed increase in the "desire" for change. Those interventions may be helpful for program/practice development working in the transtheoretical model.

Implications for Research

There is a definite need for increased research on the issue of substance misuse within the context of the Canadian workplace and labour standards.

Public health practitioners can assist in the research and development of evidence informed practice through systematic evaluation of any workplace interventions in which they are involved.

Future research should include adequate sample sizes for reliable effect analysis.

Methodological issues of this and previous reviews such as selection bias; blinding and attrition; and social desirability should be carefully considered to strengthen the reliability of reported outcomes.

Funders can support research through funding protocols to allow for studies with long term (5-10 years) outcome measurement goals.

Journal editors/reviewers should demand methodological rigour from all authors submitting articles for peer review in this subject area.

Implications for Policy

Policies developed in the workplace to address substance misuse need to be clear and specific.

Policies to address substance misuse need to be widely and regularly disseminated in the workplace. Vehicles to address this can include new employee orientation and refresher programs for all staff.

Workplace policies should provide detailed instructions on how workplace substance misuse must be handled. As well, workplaces need to support supervisory staff to ensure that they can enforce those policies.

Figures and Tables

Figure 1: *Search Results*

Table 1: *Quality Assessment Results for All Relevant Studies*

Table 2: *Results of Included Studies*

Figure 1: Search Results

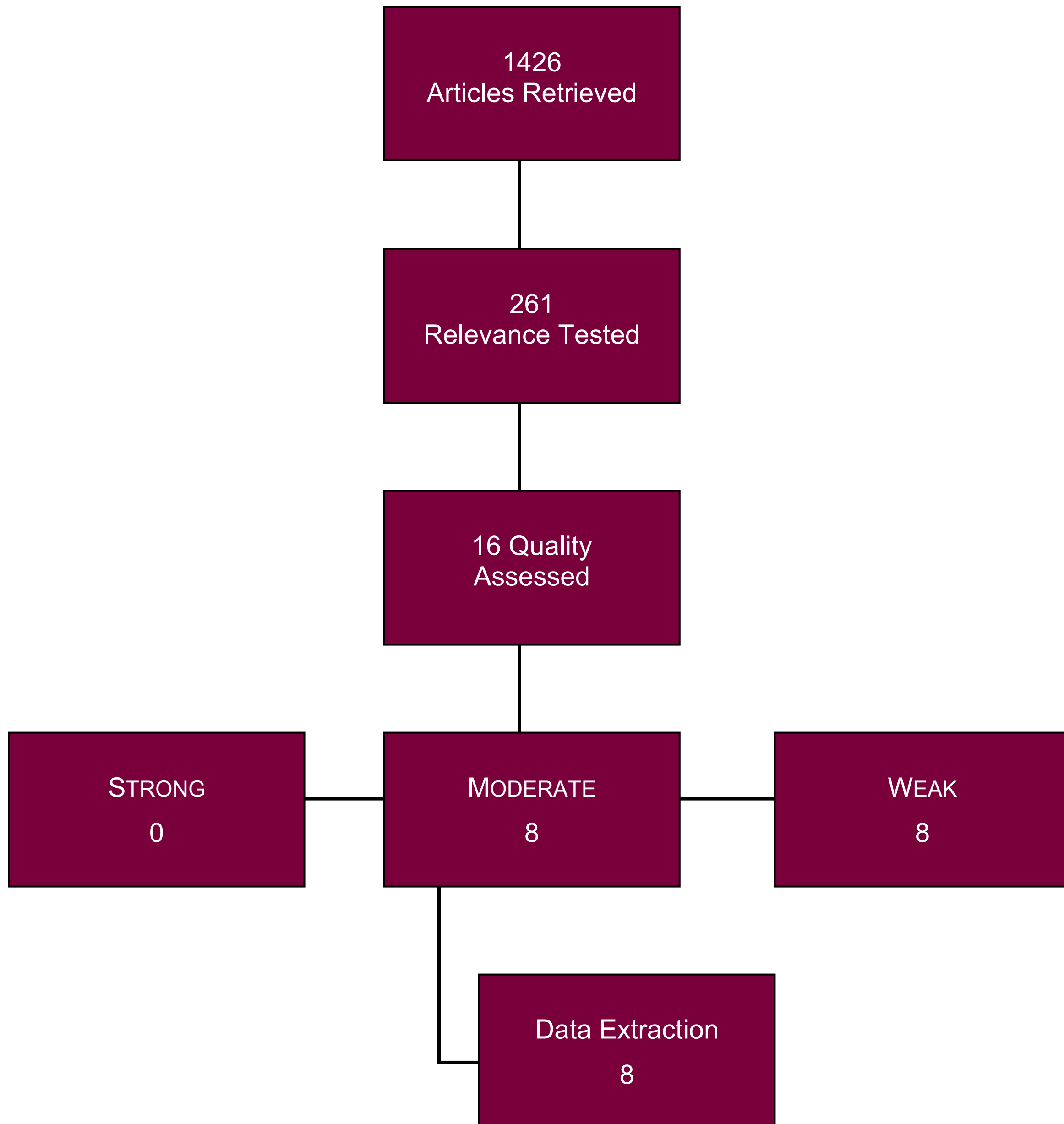

Table 1: Quality Assessment Results for All Relevant Studies (n=16)

Author/Date	Selection Bias	Allocation Bias	Confounders	Blinding	Data Collection Methods	Withdrawals/ Dropouts	Global Ratings
Anderson, B. K. and Larimer, M. E., 2002	Weak	Strong	Strong	Moderate	Strong	Moderate	**MODERATE**
Araki, I., et al., 2006	Moderate	Strong	Weak	Moderate	Strong	Moderate	**MODERATE**
Bennett, J.B., et al., 2004	Moderate	Strong	Strong	Moderate	Strong	Weak	**MODERATE**
Cook, R.F., et al., 1996b	Moderate	Strong	Strong	Moderate	Moderate	Moderate	**MODERATE**
Cook, R.F., et al., 1996b	Weak	Moderate	Strong	Moderate	Strong	Weak	**WEAK**
Cook, R.F., et al., 2004	Moderate	Strong	Strong	Moderate	Weak	Weak	**WEAK**
Deitz, D., et al., 2005	Weak	Moderate	Strong	Strong	Strong	Weak	**WEAK**
Heirich, M. and Sieck, C.J., 2000	Weak	Strong	Strong	Moderate	Weak	Weak	**WEAK**
Kishchuk, N., et al., 1994	Weak	Strong	Strong	Strong	Strong	Weak	**WEAK**
Lang, T., et al., 1995	Moderate	Strong	Weak	Moderate	Strong	Moderate	**MODERATE**
Lapham, S.C., et al., 2003	Moderate	Moderate	Strong	Moderate	Strong	Weak	**MODERATE**
Matano, Koopman, Wanat, Winzelberg, et al., 2007	Weak	Strong	Weak	Moderate	Strong	Strong	**WEAK**
Richmond, R., et al.,1999	Weak	Strong	Strong	Strong	Strong	Weak	**WEAK**
Richmond, R., et al.,1999	Moderate	Moderate	Strong	Strong	Strong	Weak	**MODERATE**
Stoltzfus, J.A. and Benson, P.L., 1994	Moderate	Strong	Strong	Moderate	Weak	Strong	**MODERATE**
Walters, S.T. and Woodall, W.G., 2003	Weak	Strong	Weak	Strong	Strong	Weak	**WEAK**

Table 2: Results of Included Studies (n=8)

Study Identification	Design and Participants	Intervention	Results/Outcomes	Comments/Limitations
Anderson, B. K. and Larimer, M. E., 2002 United States **MODERATE**	RCT to evaluate the efficacy of a brief, individual, alcohol misuse prevention program. English 155 active (not retired or on leave) employees of a medium sized company in the food and retail service sector. 66.3% males (n=65) and 73.7% females (n=42) who reported at least one drinking occasion during the month prior to the baseline assessment. **Theoretical Framework:** not described **Funding:** the Alcohol and Drug Abuse Institute at the University of Washington	Intervention (n=82) Participants met with a trained feedback provider for a 30-60 minute individualized feedback session. The sessions were constructed as a brief intervention model using motivational interviewing techniques. This included personal feedback information, alcohol education and skills building. All participants received the same core information about alcohol use. Follow up assessment occurred 6 months after baseline assessment. No Treatment Control (n=73)	No significant differences between completers and dropouts across baseline alcohol related problems. There were no significant differences in terms of intervention condition, gender, age, or ethnicity. There was a marginally significant Time X Condition X Gender interaction, $F(1,52) = 4.01$, $p<.055$.	Self reported data No participants reported being in the moderate or high levels of alcohol dependency suggesting that the alcohol-dependent drinkers chose not to participate. Potential for between group contamination existed as a result of employees within the organization being randomized within the same worksite. Small sample size, leading to inadequate statistical power may have been the reason for the lack of statistical significance in between group comparisons.

Study Identification	Design and Participants	Intervention	Results/Outcomes	Comments/Limitations
Araki, I., et al., 2006 Japan **MODERATE**	RCT The study examined the effectiveness of face-to-face education and e-mail health education on alcohol use. Participants were stratified by age and job types (administrative vs. manufacturing). English Male workers in a manufacturing plant **Theoretical Framework:** not described **Funding:** not described	Face-to-face (n=12) Two sessions for each participant in two months. Each session lasted about 30 minutes with educational lecture, brochure and goal setting. Goals were tailored to the individual taking into consideration personal values, lifestyle and job conditions. The participant set, reviewed and managed own goal and goals were challenging but achievable. A counsellor was available outside of the scheduled sessions. Email (n=12) Tailored email sent to participants with the same brochure as the face-to-face group. The message provided education and advice to assist in goal setting. Email was used as the means of communication for goal setting, goal assessment, monitoring and support. No Treatment Control (n=12)	**Knowledge:** Face-to-face group: Significant difference across groups ($p=0.0018$) between face-to-face and the other two groups. **Attitude:** Significant difference across groups ($p=0.0149$) between face-to-face and the other two groups **Behaviour:** Face-to-face: Across group differences were significant ($p=0.0472$) between face-to-face and the other two groups.	Duration of study was short (only two months). Small sample size limited statistical power. Inclusion measurement at baseline was serum γ-GTP as the objective marker for alcohol consumption which is also associated with other conditions such as obesity. Results may be confounded.

Study Identification	Design and Participants	Intervention	Results/Outcomes	Comments/Limitations
Bennett, J.B., et al., 2004 United States **MODERATE**	RCT examined the effectiveness of classroom health promotion/prevention training designed to improve work climate and alcohol consumption outcomes. Subjects were randomized into psychosocial or informational interventions or control group. Participants were employed in work department of a large municipality. English **Theoretical Framework:** Social Health Promotion Model **Funding:** the National Institute of Drug Abuse and the Center for Substance Abuse Prevention	Team Awareness (n=201) Psychosocial program provided skills training in peer referral, team building and stress management consisting of five components conducted in two 4-hour sessions, two weeks apart. Informational (n=192) Training using didactic review of policies, employee assistance and drug testing. No Treatment Control (n=194)	Team Awareness group showed a statistically significant difference in drinking outcomes, Wilks λ=0.942, $F(4,219) = 3.36$ and p=.01. when compared with the control group. Condition by age interactions were significant for problem drinking $F(2,227) = 3.03$; p =.05). Overall differences between informational and either the team or control group were not significant.	Outcomes were self-reported. High attrition rates at post-test (41%) and follow-up (55%). Study may not be generalizable to other workplaces. Unit of allocation and unit of analysis different but no cluster analysis was performed which may make the results larger than they actually are.

Study Identification	Design and Participants	Intervention	Results/Outcomes	Comments/Limitations
Cook, R.F., et al., 1996a United States **MODERATE**	RCT to field test a substance abuse prevention program with the goal of using the results to develop an expanded program model for workplace substance abuse prevention. Say Yes! Healthy Choices for Feeling Good" designed to reduce alcohol and other drug abuse and to improve health-related attitudes and behaviour. Implemented in a manufacturing facility. English **Theoretical Framework:** Social Learning Model **Funding:** not described	Program Group (n=192) received three to four sessions in classroom, a multi-segmented video and a booklet delivered on site over a three-week period. No Treatment Control (n=179) who received the program after the program group.	Number of Drinks per week ($F(1,205)=183$, $p=.18$) and Frequency of Heavy Drinking ($F(1,158)<1.0$, n.s.), there were no significant differences between groups at posttest. Desire to Reduce Drinking ($F(1,140)=6.18$, $p=.01$) ↑ program group and ↓ control group. Change from pretest to posttest within each group was not significant. Drinking Problems significant difference ($F(1,147)=4.49$, $p=.04$), the change was attributable to a ↓ by control group rather than the program group, which did not change.	Sample was representative of the company's workforce, but not technically a random sample. All selected employees were strongly encouraged by their managers to attend the program, however some did not. The number not selected and not attending is not reported. This may have impacted the results of the study. Many participants were non/light drinkers who did not need to change their drinking behaviour which may make determining statistical significance effects difficult. A very low number (4%) of participants reported drug use in the 30 days prior, therefore that data was not analyzed.

Study Identification	Design and Participants	Intervention	Results/Outcomes	Comments/Limitations
Lang, T., et al., 1995 France **MODERATE**	RCT to improve blood pressure among hypertensive excessive alcohol drinkers. Cluster randomization of workplace physicians (n=14) were screened during annual physical examinations for hypertension and excessive alcohol consumption. People with both variables were randomized into intervention or control group. English **Theoretical Framework:** not described **Funding:** Fondation de France	The intervention (n=67) was based on training the worksite physicians and follow-up of those hypertensive subjects defined as excessive drinkers. Follow up at 1, 3, 6, 18 mos. Was based on self-monitoring of alcohol consumption by the subject. Control Group (n=62) physicians were requested to continue with their current procedures, including any activity or campaign dealing with cardiovascular disease or alcohol.	At one year, alcohol consumption was greater in the intervention group (-2.8 (5.2) glasses/day) than in the control group (-1.6 (3.4) ($p<0.1$). At two years, no significant difference was observed.	It appears that the outcome assessors were not blinded. The control group results may have impacted the intervention as the physicians needed to inform the staff and persuade the participants to return for a second visit if they had high BP.

Study Identification	Design and Participants	Intervention	Results/Outcomes	Comments/Limitations
Lapham, S.C., et al, 2003 United States **MODERATE**	Cohort Analytic (two group pre/post) to examine whether enhancements to the existing employee wellness program (EWP) and EAP reduced harmful or hazardous alcohol use (binge drinking) among healthcare professionals. English **Theoretical Framework:** not described **Funding:** the Office of Workplace Programs, Center for Substance Abuse Prevention of the Substance Abuse and Mental Health Services Administration.	"Project Wise" (Workplace Initiative in Substance Education) (n=3442) EAP had one full-time counsellor and EWP was administered by a health educator. Program enhancements included substance misuse training for management staff, mailed substance prevention information, brief motivational counselling for staff and family members and an awareness campaign of problems of substance misuse to all staff. Control (n=2032) Usual care	At the intervention site, binge drinkers showed a marked increase in their desire to reduce alcohol consumption while at the control site the opposite was true. However, the actual days of binge drinking did not differ significantly between the intervention and control sites.	This study was limited by: the low number of participants who engaged in binge drinking (binge drinking was defined as 5+ drinks per occasion at least once in the 30 days prior to the assessment). Low completion of HRA rate by males (who are more likely than females to engage in binge drinking) (10.6% vs. 22%, p=<0.05) and those in the highest paid category vs. all others (16.6% vs. 24.4%, p=<0.05). The follow-up time (22 months) was adequate for measuring short-term changes but not long-term outcomes.

Study Identification	Design and Participants	Intervention	Results/Outcomes	Comments/Limitations
Richmond, R., et al., 1999 Australia **MODERATE**	RCT to evaluate the effectiveness of brief intervention to reduce excessive drinking, smoking and stress (research focus: alcohol consumption) among police. English **Theoretical Framework:** not described **Funding:** not described	"Drinking Detectives" (n=152) received advice based on motivational interviewing principles and self-help materials that included: the pros and cons of heavy drinking; the health effects of excessive alcohol consumption; comparing personal consumption with Australian drinking norms; and hints for cutting down on drinking. Participants were given a Drinking Detective kit consisting of a booklet and an audiotape of a radio play set in the workplace. No Treatment Control (n=203)	A significant increase in awareness of alcohol policies in the workplace by both experimental and control groups over time ($p<0.01$). In both the experimental and control groups women showed a significant drop in consumption over screening occasion compared to an increase in consumption for men (Z-2.12, $p>0.05$).	In a qualitative component of this study participants expressed distrust of workplace management which may have led to participants discounting researchers' assurances of confidentiality. Participants may have been concerned that information used to code (birth dates) may have been used to track individual's behaviours.

Study Identification	Design and Participants	Intervention	Results/Outcomes	Comments/Limitations
Stoltzfus, J.A. and Benson, P.L., 1994 United States **MODERATE**	RCT assessing the effectiveness of multiple and interactive strategies aimed at altering workplace culture and promoting employee "ownership" of substance misuse programs. Implemented at a large manufacturing plant. English **Theoretical Framework:** not described **Funding:** not described	Experimental Site (n=445), three core components: a ten-hour supervisory training program; a 21/2 hour all-employee program designed to discuss corporate policies, clarify personal alcohol-use guidelines, promote dialogue about appropriate responses and responsibility for substance use in/outside the workplace; and a peer-helper program No Treatment Control (n=214)	Measured in percentages a 5%+ change in the desired direction was used as representing meaningful change. All the changes which met the 5% criteria were found only in the experimental site. These included: Used alcohol once or more in last 30 days ↓6% Have 4 or more drinks "when I drink" ↓6% Have had 5 or more drinks in a row once or more in the last 2 weeks ↓5% Heavy drinker ↓5% Driven a vehicle after 3 or more drinks, once or more in the last 12 months ↓6% Ridden in a vehicle driven by someone under the influence, once or more, in the last 12 months ↓6%	Positive and modest changes at the experimental site were not maintained at delayed posttest.

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Appendices:

Appendix 1: Search Strategy
Appendix 2: Hand-searched Journals
Appendix 3: Relevance Tool
Appendix 4: Quality Assessment Tool

Appendix 1: Search Strategy

Searched for the years January 1990 to September 2007

Effectiveness	Content	Strategy	Population	Outcome	Public Health
Effect$	Substance misuse	Program$	Adult	Reduct$	Public health
Efficacy	Substance abuse	Intervention$	Worker$	Eliminat$	Health promotion
Evaluat$	Substance depend$	Employee Assistance$	Employee$	Abstinence	Health education
Outcome$	"Problematic substance use"	Educat$	Age: 19-55	"early identification"	Occupational health
Impact	Drug misuse	Counsel$	Male/female	"self-management"	Preventative health services
Evidence	Drug abuse	Advocac$		Relapse prevention	Employee health
Assess$	Drug depend$	Harm reduction		Rehabilitation	Education
Compare$	Alcohol$	Treatment			Population health
	Addict$	Screening			Injury prevention
	Concurrent Disorders	Peer support			Public policy
		Mentoring			
		Withdrawal management			
		Case management			

CINAHL

EMBASE

MEDLINE

HealthSTAR (Ovid)

PsycINFO

Sociological Abstracts

Appendix 2: Hand-Searched Journals

Addiction

Alcohol Research and Health

American Journal of Health Promotion

American Journal of Preventive Medicine

American Journal of Public Health

British Medical Journal

Canadian Journal of Health Promotion

Canadian Medical Association Journal

Canadian Journal of Public Health

Health Education and Behavior

Health Promotion International

New England Journal of Medicine

Journal of the American Medical Association

Appendix 3: Relevance Tool

Relevance Criteria

1.	The study involves an intervention relevant to public health/health promotion practice consistent with the Ontario Public Health Standards.	Y N
2.	The study reports on an intervention targeted at changing behaviour (therapies, strategies, counselling, education, skill building, or supportive environment) in the workplace relating to substance misuse (alcohol or drugs). Tobacco is not relevant.	Y N
3.	The study implements the intervention in a population of adults in the workplace.	Y N
4.	The intervention takes place in countries where workplace practices and standards are similar to those in Ontario: Canada, the United States, Australia, New Zealand, or Northwestern Europe (United Kingdom, Ireland, Norway, Sweden, Denmark, France, Belgium, Netherlands, Germany, Switzerland, Austria).	Y N
5.	The study reports a behaviour outcome related to substance use behaviours that related to reduction of substance misuse (reduction, elimination, abstinence, "early identification", "self-management", relapse prevention and/or rehabilitation)	Y N
	Reviewer Decision	
	Include in critical appraisal (only if answer 'yes' to all 5 relevance criteria)	Y N
	If Discrepancy in Inclusion Decision:	
	Reason for discrepancy Oversight Difference in interpretation of criteria Difference in interpretation of study Additional Comments:	 Y N Y N Y N
	FINAL DECISION: INCLUDE IN STUDY	Y N

Appendix 4

EFFECTIVE PUBLIC HEALTH PRACTICE PROJECT (EPHPP)

QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES

COMPONENT RATINGS

A) SELECTION BIAS

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?

1 Very likely
2 Somewhat likely
3 Not likely
4 Can't tell

(Q2) What percentage of selected individuals agreed to participate?

1 80 - 100% agreement
2 60 – 79% agreement
3 less than 60% agreement
4 Not applicable
5 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

B) STUDY DESIGN

Indicate the study design

6 Randomized controlled trial
7 Controlled clinical trial
8 Cohort analytic (two group pre + post)
9 Case-control
10 Cohort (one group pre + post (before and after))
11 Interrupted time series
12 Other specify ____________________________
13 Can't tell

Was the study described as randomized? If NO, go to Component C.

No Yes

If Yes, was the method of randomization described? (See dictionary)

No Yes

If Yes, was the method appropriate? (See dictionary)

No Yes

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

C) CONFOUNDERS

(Q1) Were there important differences between groups prior to the intervention?

14 Yes
15 No
16 Can't tell

The following are examples of confounders:

17 Race
18 Sex
19 Marital status/family
20 Age
21 SES (income or class)
22 Education
23 Health status
24 Pre-intervention score on outcome measure

(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?

25 80 – 100%
26 60 – 79%
27 Less than 60%
28 Can't Tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

D) BLINDING

(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?

29 Yes
30 No
31 Can't tell

(Q2) Were the study participants aware of the research question?

32 Yes
33 No
34 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

E) DATA COLLECTION METHODS

(Q1) Were data collection tools shown to be valid?

35 Yes
36 No
37 Can't tell

(Q2) Were data collection tools shown to be reliable?

38 Yes
39 No
40 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

F) WITHDRAWALS AND DROP-OUTS

(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?

41 Yes
42 No
43 Can't tell

(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).

44 80 -100%
45 60 - 79%
46 less than 60%
47 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

G) INTERVENTION INTEGRITY

(Q1) What percentage of participants received the allocated intervention or exposure of interest?

48 80 -100%
49 60 - 79%
50 less than 60%
51 Can't tell

(Q2) Was the consistency of the intervention measured?

52 Yes
53 No
54 Can't tell

(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?

55 Yes
56 No
57 Can't tell

H) ANALYSES

(Q1) Indicate the unit of allocation (circle one)

community organization/institution practice/office individual

(Q2) Indicate the unit of analysis (circle one)

community organization/institution practice/office individual

(Q3) Are the statistical methods appropriate for the study design?

58 Yes
59 No
60 Can't tell

(Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?

61 Yes
62 No
63 Can't tell

GLOBAL RATING

COMPONENT RATINGS

Please transcribe the information from the gray boxes on pages 1-4 onto this page.

A SELECTION BIAS

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

B STUDY DESIGN

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

C CONFOUNDERS

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

D BLINDING

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

E DATA COLLECTION METHODS

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

F WITHDRAWALS AND DROPOUTS

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

GLOBAL RATING FOR THIS PAPER (circle one):

1	STRONG	(four STRONG ratings with no WEAK ratings)
2	MODERATE	(less than four STRONG ratings and one WEAK rating)
3	WEAK	(two or more WEAK ratings)

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

No Yes

I*f yes, indicate the reason for the discrepancy*

1 Oversight
2 Differences in interpretation of criteria
3 Differences in interpretation of study

Final decision of both reviewers (circle one):

1 STRONG
2 MODERATE
3 WEAK