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Risk of Job-Related Injury Among Construction Laborers With a Diagnosis of Substance Abuse

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Abstract

This study attempts to determine whether a diagnosis of substance abuse among construction laborers is associated with an increased risk of work-related injuries. Records for construction laborers in Washington State who were covered by health insurance through the local union were matched against workers' compensation records in the Washington State Department of Labor and Industries. Using the health insurance records, we identified those who had a diagnosis of substance abuse during the two-year period 1990-1991. Using the workers' compensation records, we were then able to compare injury rates for those with substance abuse diagnoses with the rates for those without such diagnoses. The total cohort consisted of 7,895 laborers. **Among the 422 who had a substance abuse diagnosis, the rate of time-loss injuries per 100 full-time equivalent workers was 15.1, compared with 10.9 among the remainder of the cohort. Most of the difference appeared in the 25-34-year age group, in which the rate of injury per 100 full-time equivalent workers was 23.6 for substance abusers, compared with a rate of 12.2 for non-substance abusers, for a statistically significant relative risk of 1.93.** The study suggests that younger workers might be an appropriate target for interventions aimed at reducing the level of substance abuse as a way of preventing injuries on the job. Studies by others have indicated some degree of success in this direction through the use of employee assistance programs in which the worker is referred to specific programs or providers for treatment. The state legislature in Washington has recently passed legislation providing incentives for the use of employee

assistance programs. More effort is needed, however, to evaluate the effectiveness of such programs.

Construction workers in general, and construction laborers in particular, are at high risk of injury on the job. In 1994, the incidence rate of injuries on the job among construction workers was 11.5 per 100 full-time workers, compared with 7.7 among workers in private industry as a whole. The corresponding rates for injuries involving days away from work were 5.4 for construction workers, compared with 3.5 for all private industry.¹ Construction laborers accounted for more than one-quarter of the construction injuries. These high rates raise questions about possible risk factors for injury on the job, which, if eliminated or reduced, could result in a reduction of work-related injuries.

One possible risk factor is the abuse of alcohol and drugs by construction laborers. The National Household Survey on Drug Abuse estimates the percentage of specific industry and occupation groups that had current illicit drug use, illicit drug use during the past year, and heavy alcohol use.² [Table 1](#) shows some of these percentages for 1991-1993, based on a total sample of 87,915 respondents. It is clear that use of these substances was much higher among construction laborers than the national average. A study of hospitalization for non-work-related conditions among construction laborers and their families revealed that the risk of hospitalization for alcohol and drug dependence was 10 to 13 times higher than one would expect, based on the general United States population.³ A subsequent unpublished analysis by the same authors, using data for the laborers alone, showed an even greater relative risk for these conditions. Very little has been done to investigate the relationship between alcohol or drug abuse and job-related injury. Several of the relevant studies that have been done have analyzed blood content for evidence of excess alcohol or for various kinds of drugs among occupational fatalities. The proportion testing positive for alcohol in these studies ranged from 6% to 13%.⁴⁻⁷

	Current Illicit Drug Use	Illicit Drug Use During Past Year	Heavy Alcohol Use
Total	7.3	10.0	7.1
Construction industry	12.2	20.6	12.4
Construction laborers	12.6	21.4	12.8

Table 1

Most of the investigation that has been done in this area has been on alcohol *consumption* and the risk of occupational injury,⁸⁻¹¹ rather than on the risk of occupational injury among those with a medical diagnosis of alcohol *abuse*. We have been analyzing medical care claims data on construction laborers that provides medical diagnoses for the non-work-related conditions for which these workers have received care covered by the local union health insurance plan. We have been able to obtain data on the work-related injury experience of a group of these construction laborers that makes it possible to study job-related injury rates among those who had specific pre-existing or co-existing medical conditions. The purpose of the current study, therefore, is to determine whether a medical diagnosis of substance abuse is associated with an increased risk of injury on the job.

Materials and Methods

Each year since 1989, we have received three types of computer files containing information on the medical care experience of construction laborers in the state of Washington from their union health insurance plan—a file of records for all members of the Northwest Laborers who

were eligible for the union health insurance with an indication of eligibility each month, a file of health insurance claims during the year, and a file of the numbers of hours the laborer worked each month. From these we defined a cohort of construction laborers as those who were eligible for the union health insurance for at least one month during the two-year period 1990-1991, who showed union hours worked during at least one month during that period, and who were residents of the state of Washington. The use of one month in the definition was arbitrary. "Eligibility" for the union health insurance means that the worker is covered by that insurance. A worker is "eligible" for health insurance at the beginning of the second month after his or her accrual of 200 union hours of work and is thereby covered by the union health insurance. Each subsequent month, 120 hours are subtracted from the worker's hour bank, but the worker remains covered by health insurance as long as the number of hours in the bank remains above 120. Using name, Social Security number, and date of birth, we matched the records for this cohort against the workers' compensation claims files in the Washington State Department of Labor and Industries, the principal insurer in the state for work-related injuries among laborers. For each member of the cohort, then, we had all of the medical diagnoses from their claims under the union health insurance plan, and for those who had matching claims in the workers' compensation files, we also had information on the number and characteristics of their work-related injuries.

Our basic purpose for this analysis is to compare the rate of job-related injury among those who had a medical diagnosis of substance abuse with the rate among those without such a diagnosis during the two-year period 1990-1991. For this purpose, workers with "substance abuse" were those who had one of the following International Classification of Diseases (ICD-9) diagnoses on health insurance claims any time during the two-year period: Alcoholic psychoses (291); Drug psychoses (292); Alcohol dependence syndrome (303); Drug dependence (304); and Non-dependent abuse of drugs (305). Only injuries that occurred during months in which the worker logged union hours were counted, since we had no data on the number of hours of exposure to the risk of injury when the injury occurred during a month in which there were no union hours worked. About one-third of the time-loss injuries among those with a diagnosis of substance abuse occurred before the diagnosis of substance abuse was established. These injuries were counted as occurring among those without a diagnosis of substance abuse.

To compare injury rates among those with substance abuse diagnoses with injury rates among those without such diagnoses, we computed injury rates per 100 person-year is defined as 2,000 hours of work, using the monthly number of hours worked for each worker. For those with a diagnosis of substance abuse, hours worked prior to the month in which the substance abuse diagnosis was made were included in the non-substance abuse denominator, and hours from the diagnosis month until the end of 1991 were included in the substance abuse denominator. For those without a diagnosis of substance abuse, all of their hours worked were included in the non-substance abuse denominator. If a worker had more than one injury during the two-year period, he or she was counted only once as an injured worker. However, each of the small number of workers who had injuries both before and after the diagnosis of substance abuse was counted once in each of the two categories. We examined all job-related injuries and job-related time-loss injuries that involved the loss of four or more days from work. Since time-loss injuries are the more serious injuries, they will be the primary focus of our analysis.

Results

The total cohort of construction laborers consisted of 7,895 workers who were eligible for the union health insurance for at least one month during the two-year period 1990-1991 and who worked union hours during at least one month during that period. Of these, 422 had a diagnosis of substance abuse during the two-year period. The percent distribution of these among the five ICD categories comprising "substance abuse" was as follows: ICD 291 (alcohol psychoses), 1.2%; ICD 292 (drug psychoses), 0.5%; ICD 303 (alcohol dependence syndrome), 84.4%; ICD 304 (drug dependence), 5.3%; and ICD 305 (non-dependent abuse of drugs), 8.8%. The numbers and rates of all injuries and of time-loss injuries among those with substance abuse diagnoses and among those without such diagnoses are shown in [Table 2](#). [Table 3](#) presents the rate of injury per 100 full-time equivalent workers for specific age groups for time-loss (ie, the more serious) injuries. The greatest difference appeared in the 25-34-years age group, in which those with a diagnosis of substance abuse showed an excess risk of serious injury of 93% over that for those without such a diagnosis. Because of the fact that there is practically no difference in injury rates between the substance abuse group and the non-substance abuse group for each age group except the 25-34-year age group, a summary rate over all age groups does not provide a good measure of relative risk. A more accurate statement of the results is that there is an injury risk ratio of 1.93 (95% confidence interval, 1.27-2.59) for the 25-34 age group and virtually no difference in risk for the other three age groups. Therefore, the difference in rates (23.6 vs 12.2 per 100 full-time equivalent workers) for that age group is statistically significantly at the 5% level.



Table 2 Table 3

To compare the kinds of serious injuries experienced by those with and without substance abuse diagnoses, we used the American National Standards Institute (ANSI) Z16 codes contained on the workers' compensation records for type of injury, nature of injury, and part of body affected. Since the distributions are remarkably similar between the two groups, the results are not shown. Furthermore, because there were only 44 workers with substance abuse diagnoses who had time-loss injuries, the numbers are too small to allow definitive conclusions to be drawn from these comparisons.

Discussion

The findings given above are suggestive of an increased risk of work-related injury among laborers who have had a diagnosis of substance abuse, although the numbers are small. This relationship appears to be confined to those in the 25-34-year age group. It is difficult to compare these findings with those from other studies because of differences in the ways those with substance abuse are identified. Stallones and Kraus¹² emphasize the problem of lack of comparability of data across studies of the role of alcohol in workplace injuries due to the lack of a standardized definition of an alcoholic. Dawson⁸ showed that the odds ratio for occupational injury during the past year increased from 1.08 for those with one occasion of heavy drinking to 1.74 for those with daily heavy drinking. The Dawson study also showed the highest level of alcohol consumption and the highest occupational injury rate in the 19-29-year age group. Lewis and Cooper⁶ found that the highest rate of detectable alcohol

content among work-related fatalities was in the 25-34-year age group, thus pointing toward this group as a target for further study and for preventive efforts. In the present study, we do not know the relationship between the frequency of heavy drinking and the establishment of a diagnosis of alcohol dependence. Since our study requires that a worker have a *diagnosis* of alcohol or drug abuse in order to be included in the substance abuse group, the number so diagnosed undoubtedly underestimates the number of heavy alcohol or drug users in the worker population.

We should reiterate that over 85% of our substance abuse group subjects were workers with a diagnosis of an alcohol-related disorder. Therefore, the findings could be interpreted as primarily related to alcohol problems. To pursue this further, we carried out the above analysis using as the exposure group only those who had a diagnosis of alcohol disorder (ICD codes 291 and 303). The results were virtually identical. The relative risk in the 25-34-year age group was 1.79 and in the other three age groups, slightly less than unity. The number of workers with a diagnosis of drug abuse alone was too small to permit a separate analysis.

If we were to have considered all injuries in our analysis rather than only the more serious (time-loss) injuries, the relative risk of injury among those with substance abuse was only somewhat greater than unity in the 25-34-year age group (1.19) and the 35-44-year age group (1.27). Therefore, if we had considered only all injuries combined, the relationship between substance abuse and the more serious injuries would have been missed.

There are several other factors inherent in the data used for this analysis that render interpretation of the findings difficult. We will examine these factors briefly and consider how they may affect the findings.

We counted injuries among those with a diagnosis of substance abuse only if the injury occurred after the diagnosis of substance abuse. However, if we had assumed that those with a diagnosis of substance abuse had the substance abuse problem over the entire period, the number of time-loss injuries would have been 63 instead of the 44 indicated above. This would have yielded a relative risk of time-loss injury among those with a diagnosis of substance abuse of 1.49 in the 25-34-year age group, also statistically significant at the 5% level.

The union health insurance does not cover the cost of treatment for substance abuse unless the worker agrees to enter one of several specific treatment programs. Thus some substance abusers either do not receive treatment at all or payment for treatment comes from some other source, and the information does not appear in the union health insurance data. Another factor that precludes identification of substance abuse problems is the fact that the union health insurance plan for these laborers had a \$10,000 lifetime limit for the treatment of these conditions. Since this study covers only the two-year period 1990-1991, some of the workers with substance abuse problems may have already reached this maximum before the study period began. Also, a number of workers with substance abuse problems may never have sought medical care. Therefore, some unknown number of workers with substance abuse problems will be included in the non-substance abuse group in our analysis, which may have the effect of underestimating the relative risk of injury associated with substance abuse.

There were 92 laborers with time-loss injuries whose injuries occurred during months when they did not log any union hours of work. These workers were most likely working for non-

union employers during those months. Neither the time spent on non-union jobs nor the injuries occurring during those months were included in our analysis. Five of these were workers who had a diagnosis of substance abuse. These injuries were not included in our analysis because no data were available on the number of hours they were at risk of injury during those months. Because of the small numbers, they are not likely to affect any conclusions we would draw from the analysis.

To better understand the relationship between substance abuse and job-related injury, more information is needed beyond that which was available for this analysis. Foremost among the data items needed is information on the type of work each laborer was doing. This could be a very important confounding factor. A survey of the laborer population would be required to obtain that type of information.

If, in fact, there is over a 90% increase in risk of more serious injury among the younger workers who are substance abusers, a more systematic way of treating these problems may result in a reduction in work-related injuries. This is particularly important because of the studies and surveys mentioned above that show a heavy use of alcohol and drugs among construction laborers. Gill¹³ has reviewed some of the literature on industrial programs for the treatment of workers who are problem drinkers and concluded that the evidence on the impact of these programs is very limited.

The Washington State legislature recently passed a law that provides a 5% discount on workers' compensation premiums to private employers who provide a drug-free (including alcohol-free) workplace and are deemed qualified by the Washington Department of Social and Health Services(DSHS).¹⁴ This legislation was passed to provide an incentive to employers to reduce workplace injuries. One of the elements for qualification under the act is an employee assistance program that is approved by the Division of Alcohol and Substance Abuse at the DSHS. Using the union health insurance as a lever by providing coverage for substance abuse treatment only if the worker enters an approved program may also be a step in the right direction. More work is needed to assess more specifically the relationship between substance abuse and injuries on the job and to monitor the effect of measures aimed at improving treatment and preventing injuries among these workers. The finding in this analysis would suggest that targeting intervention programs to the population at highest risk (the 25- to 34-year-old workers) might be a more cost-effective approach.

Acknowledgments

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Table 1

[Risk of Job-Related Injury Among Construction Laborers With a Diagnosis of Substance Abuse?](#)

Pollack, Earl S.; Franklin, Gary M.; Fulton-Kehoe, Deborah; Chowdhury, Risana
 Journal of Occupational and Environmental Medicine. 40(6):573-577, June 1998.
 doi:

	Current Illicit Drug Use	Illicit Drug Use During Past Year	Heavy Alcohol Use
Total	7.3	15.0	7.1
Construction industry	12.2	20.6	13.4
Construction laborers	12.8	25.4	19.9

* From Reference 2.

TABLE 1 Percentage of Full-Time US Workers, Ages 18-49, Reporting Drug Use, 1991-1993*

Table 2

[Risk of Job-Related Injury Among Construction Laborers With a Diagnosis of Substance Abuse?](#)

Pollack, Earl S.; Franklin, Gary M.; Fulton-Kehoe, Deborah; Chowdhury, Risana
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Group	Number of FTEs*	Number Injured [†]		Rate per 100 FTE	
		Total Injuries	Time Loss Injuries	Total Injuries	Time Loss Injuries
Total	7,813	2,270	861	29.1	11.0
With substance abuse	291	100	44	34.4	15.1
Without substance abuse	7,522	2,189	819	29.8	11.2

* The number of full-time equivalent workers (FTE) is the number of hours worked divided by 2,000.
[†] The numbers with and without substance abuse add to more than the total because some individuals appeared in both groups.

TABLE 2 Number and Rate of Laborers Injured Among Those With and Without Diagnoses of Substance Abuse, Washington State, 1990-1991

Table 3

[Risk of Job-Related Injury Among Construction Laborers With a Diagnosis of Substance Abuse](#)

Pollack, Earl S.; Franklin, Gary M.; Fulton-Kehoe, Deborah; Chowdhury, Risana
 Journal of Occupational and Environmental Medicine. 40(6):573-577, June 1998.

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Age	With Substance Abuse Diagnoses		Without Substance Abuse Diagnoses		Relative Risk
	Number Injured	Rate Injured	Number Injured	Rate Injured	
Under 25 years	1	4.8	49	10.9	0.44
25–34 years	26	23.6	267	12.2	1.93 [†]
35–44 years	12	11.4	259	10.4	1.10
45+ years	4	7.7	211	9.7	0.79
Unknown	1	33.3	33	16.9	1.97
Total	44	15.1	819	10.9	1.39

* Number injured per 100 full-time equivalent workers.
 † Statistically significant at the $P = 0.05$ level.

TABLE 3 Risk* of Time-Loss Injuries Among Laborers With and Without Substance Abuse Diagnoses, Washington State, 1990-1991