ALCOHOL CONSUMPTION PATTERNS OF CONSTRUCTION WORKERS IN HONG KONG

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ABSTRACT

Alcohol consumption is prevalent among construction workers, and it may have negative implications for workers' overall health, productivity, and safety performance. The alcohol-related risks are associated with drinking pattern and consumption volume. To understand the drinking pattern and help devise effective interventions to prevent drinking problem in construction workers in Hong Kong, the research team conducted a one-month drinking pattern survey with a convenience sample of construction workers on railway projects in Hong Kong, using the Alcohol Use Disorders Identification Test (AUDIT) as the primary instrument. With 1203 valid responses, the research team compared alcohol-related risk exposure among different categories of workers through Chi-squared tests. The results showed that 16.6% of respondents drink excessively, and 28% drink in a harmful way. Furthermore, male workers are prone to more severe alcohol-related risks than their female counterparts, Nepalese workers are exposed to more severe alcohol-related risks than their Chinese counterparts, workers in four trades (i.e., mechanics, welders, shotfirers, and miners) are more likely to experience alcohol-related risks than others, and workers in the age group of 30-39 are subject to more severe alcohol-related risks. The findings can help regulatory bodies formulate industry-wide codes of practice and prompt management to give special attention to certain categories of workers.

Keywords: Audit; Chi-squared Test; Construction Worker; Hong Kong.

1. INTRODUCTION

Alcohol is the most widely used and misused psychoactive substance, which has the potential to impair cognitive and behavioural performance (Frone, 2006). Given the specific context, Frone (2004) distinguishes alcohol use and impairment off-the-job from on-the-job. Accordingly, Frone (2006) later on presents two (02) related concepts: alcohol use and impairment in the workforce and alcohol use in the workplace. Alcohol use and impairment in the workforce largely reflects use and impairment away from work and outside an individual's normal work hours, while alcohol use in the workplace represents impairment due to alcohol use during one's work hours.

Workplace alcohol use and impairment are prevalent, and construction workers are potentially at risk for workplace alcohol use and impairment. In the U.S., Frone (2006) draw a national probability sample of 2805 employees using a random digit dialling telephone survey, and explore the extent of alcohol use and impairment in the workplace. Workplace alcohol use and impairment was found to directly affect an estimated 15% of the U.S. workforce. In particular, the study found that an estimated 1.83% drink before work, 7.06% drink during the workday, 1.68% work under the influence of alcohol, and 9.23% work with a hangover. Furthermore, employees in the construction and extraction occupations were more likely to experience workplace alcohol use and impairment. In a similar vein, a review of alcoholism and occupations suggests a high prevalence of alcohol dependence and misuse in construction, and shows that more than one (01) in four (04) construction labourers and one (01) in five (05) skilled construction trade workers receives a diagnosis related to alcohol misuse (Mandellet *et al.*, 1992). In Australia, Biggs and Williamson (2013) also found that over half of those sampled in the construction sector are at risk of hazardous alcohol consumption. Mosconi *et al.* (2007) conducted a study on alcohol consumption and the consequences that alcohol abuse has on health,

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working ability, accidents and absenteeism in construction workers. They found that alcohol consumption during pauses in work is still common (Mosconi *et al.,* 2007). High alcohol consumption is also associated with long-term unemployment among middle-aged construction workers (Leino-Arjas *et al.,* 1999).

Alcohol use may pose a risk to employees' overall health, productivity and safety. Excessive drinking is definitely detrimental to health, although non-drinking pattern is not preferable either. With a cohort of male employees in the German construction industry, Brenner *et al.* (1997) founda very strong U-shaped relationship between alcohol consumption and all-cause mortality. In particular, they foundthat mortality was 2.8 times higher among non-drinkers than among men who consumed 1-49 g of alcohol per day, and strongly increased mortality among heavy drinkers. Alcohol is involved in a wide variety of diseases and disorders. It may cause liver cirrhosis, pancreatitis, hypertension, gastritis, diabetes, stroke, cancer of the mouth, cancer of the oesophagus and larynx. Alcohol-related diseases lead to work limitations or disability, and average consumption of alcohol is associated with accident frequency/seriousness and absenteeism (Mosconi *et al.,* 2007). Excessive drinking causes illness and distress, and accounts for breakdown in relationships, trauma, hospitalization, prolonged disability and early death (Baboret *et al.,* 2001).

Currently, there are few studies on the prevalence and risk of alcohol consumption among construction workers based in Hong Kong, let alone alcohol consumption on the job. This paper aims to reveal alcohol use and impairment in construction workers, i.e., to assess construction workers' overall use of and impairment from alcohol across all contexts. It reports the survey results and attempts to help understand construction workers' drinking behaviour.

2. RESEARCH METHOD

2.1. MEASURES

The Alcohol Use Disorders Identification Test (AUDIT) was used in the survey for two (02) reasons. First, it can provide an accurate measure of risk across gender, age, and cultures. Second, compared to other questionnaires, it is the best screening instrument for a whole range of alcohol problems in primary care (Babor *et al.*, 2001). The AUDIT was developed by the World Health Organization (WHO) to screen for excessive drinking and assist in brief assessment. It helps identify whether the person has hazardous (or risky) drinking, harmful drinking, or alcohol dependence. Hazardous drinking increases the risk of harmful consequences for the user or others. Harmful drinking causes harm to physical and mental health. Alcohol dependence refers to a cluster of behavioural, cognitive, and physiological phenomena, which may develop after repeated alcohol use (Babor *et al.*, 2001). In AUDIT, there are ten (10) questions, which are rated on a 5-point Likert scale (0-4). The cumulative score, therefore, ranges from zero (0) to forty (40). These ten (10) questions cover three (03) domains. The first three (03) questions, 1-3, identify hazardous alcohol use. The second three (03) questions, 4-6, identify alcohol dependence symptoms. The remaining four (04) questions, 7-10, indicate harmful alcohol use. Biggs and Williamson (2013) make some interpretations to the cumulative score in each domain. In the domain of hazardous alcohol use, the cumulative score of no less than six (6) indicates a risk of alcohol-related harm. In the domain of alcohol dependence symptoms, the cumulative score of no less than four (4) suggests possible alcohol dependence. In the domain of harmful alcohol use, any score deserves further investigation.

Furthermore, the AUDIT can provide an intervention framework to help risky drinkers reduce or cease alcohol use and hence avoid harmful consequences (Babor *et al.,* 2001). According to Babor *et al.* (2001), different ranges of the cumulative score correspond with different levels of alcohol-related risk. Currently, there are four (04) levels of risk. The first level, Level I, refers to low-risk drinking or abstinence, and is indicated by an AUDIT score between zero (0) and seven (7). At this level, the patients need alcohol education. The second level, Level II, indicates alcohol use in excess of low-risk guidelines (i.e. less than twenty (20) grams of alcohol per day, and less than six (6) days a week), and corresponds to a score between eight (8) and fifteen (15). At this level, the patients need simple advice and alcohol education. The third level, Level III, refers to harmful and hazardous drinking, and scores 16-19. Respondents at this level can be managed by a combination of simple advice, brief counselling and continued monitoring. If the respondents exhibit possible alcohol dependence, further diagnostic evaluation should be administered. The fourth level, Level IV, is indicated by an AUDIT score above nineteen (19). Respondents at this level should be referred to a specialist for diagnostic evaluation and possible treatment for alcohol dependence. Note that the AUDIT cut-off score may vary slightly

depending on the country's drinking patterns, the alcohol content of standard drinks, and the nature of the screening program.

2.2. POPULATION AND SAMPLE

The population was railway project construction workers based in Hong Kong. In cooperation with a local public utility service provider, the construction sites sampled in this study were selected based on their geographical location and the maximum number of workers accessible. In total, thirty-seven (37) construction sites involving forty-nine (49) contracts from five (05) railway projects were accessed. With assistance from the safety officer at each of the forty-nine (49) contracts, the research team approached all available construction workers on site during their pause at work. The workers were assured that their response was only for research purposes, would be kept confidential, and their participation was entirely voluntary. The survey last for a month and 1203 valid responses were obtained. Table 1 shows individual characteristics of the respondents.

Table 1: Individual Characteristics of the Respondents

Characteristics	Frequency	Percentage (%)
Gender		
Male	1015	84.4
Female	185	15.4
N.A.	3	0.2
Age (years)		
≤ 29	144	12
30 - 39	250	20.8
40 - 49	326	27.1
50 - 59	315	26.2
≥ 60	122	10.1
N.A.	46	3.8
Ethnicity		
Chinese	924	76.8
Nepalese	233	19.4
Pakistani	18	1.5
Other	22	1.8
N.A.	6	0.5
Trade		
Steel fixer	39	3.2
Shotfirer	18	1.5
Concreter	58	4.8
Rigger	59	4.9
Miner	31	2.6
Welder	60	5
Carpenter	69	5.7
Scaffolder	58	4.8
Electrical wireman	110	9.1
Leveler	86	7.1
Plasterer	14	1.2
Signal man	68	5.7
General worker	445	37
Machine operator	36	3
Mechanic	32	2.7
Surveyor	20	1.7
Role		
Worker	1093	90.9
Ganger	40	3.3
Foreman	45	3.7
N.A.	25	2.1

2.3. DATA ANALYSIS

According to responses to the AUDIT, respondents could be organised by four (04) categorical variables regarding drinking behaviour, i.e., hazardous drinking (yes/no), alcohol dependence (yes/no), harmful drinking (yes/no), and levels of alcohol-related risk (Level I, Level II, Level III, and Level IV). In addition, respondents can be categorized by another five (05) demographic variables, i.e., gender, age, ethnicity, trade, and role. Therefore, the research team decided to use chi-square tests to determine, whether there is association between respondents' drinking behaviour and individual characteristics.

3. RESEARCH FINDINGS

Overall, 81.5% of the respondents are subject to low-risk drinking and need alcohol education. 16.6% of the respondents drink excessively and need simple advice and alcohol education. 1.4% of the respondents are prone to hazardous and harmful drinking and need a combination of simple advice, brief counselling and continued monitoring. 0.5% of the respondents should be referred to a specialist for diagnostic evaluation and possible treatment for alcohol dependence. Figure 1 shows the distribution of respondents at different levels of alcohol-related risk. Furthermore, 12.8% of the respondents are drinking in a hazardous way, 3.4% of the respondents are experiencing alcohol dependence, and 28% of the respondents are drinking in a harmful way.
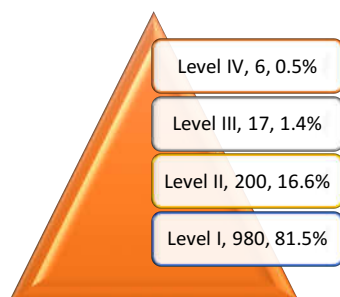

Figure 1: Distribution of Respondents at Different Levels of Alcohol-related Risk

In order to test, whether there is association between respondents' individual characteristics and drinking behaviour, the research team carried out Chi-square tests. The results of chi-square tests are shown in Table 2.

Visual inspection suggests that compared with their female counterparts, male construction workers are more likely to engage in hazardous drinking, alcohol dependence, harmful drinking, and hence are subject to higher levels of alcohol-related risk. The age group of 30-39 deserves more attention as they have more alcohol-related problems than other groups. Nepalese workers are exposed to more severe alcohol-related risks in comparison with their Chinese counterparts. Workers in ten (10) trades (i.e., steel fixers, concreters, miners, carpenters, scaffolders, electrical wiremen, levellers, signal men, machine operators, and mechanics) are more likely to experience alcohol-related risks than others.

It is interesting to find that there is no significant difference with regard to drinking behaviour and alcohol-related risk exposure among foremen, gangers and workers ($p > 0.05$).

Table 2: Results of Chi-square Tests

		Hazardous drinking		Alcohol dependence		Harmful drinking		Level of alcohol-related risks			
		Yes	No	Yes	No	Yes	No	Level I	Level II	Level III	Level IV
Gender	Male	153	862	41	974	326	689	794	198	17	6
	Female	1	184	0	185	11	174	183	2	0	0
Remark		$p < 0.05$		$p < 0.05$		$p < 0.05$		$p < 0.05$			
Age	≤ 29	30	114	7	137	47	97	113	29	1	1
	30—39	43	207	18	232	83	167	185	57	6	2
	40—49	40	286	7	319	91	235	271	48	5	2
	50—59	31	284	4	311	76	239	266	43	5	1
	≥ 60	4	118	1	121	22	100	111	11	0	0
Remark		$p < 0.05$		$p < 0.05$		$p < 0.05$		$p < 0.05$			
Ethnicity	Chinese	98	826	18	906	235	689	777	134	10	3
	Nepalese	51	182	20	213	92	141	166	59	6	2
	Pakistani	2	16	1	17	2	16	16	1	1	0
Remark		$p < 0.05$		$p < 0.05$		$p < 0.05$		$p < 0.05$			
Trade	Steel fixer	4	35	0	39	11	28	31	8	0	0
	Shotfirer	4	14	2	16	5	13	15	2	0	1
	Concreter	9	49	2	56	21	37	42	15	1	0
	Rigger	7	52	2	57	18	41	49	10	0	0
	Miner	9	22	3	28	15	16	18	11	2	0
	Welder	9	51	4	56	20	40	48	8	2	2
	Carpenter	14	55	1	68	25	44	53	15	1	0
	Scaffolder	11	47	4	54	21	37	43	14	1	0
	Electrical wireman	14	96	2	108	37	73	84	25	1	0
	Leveler	13	73	8	78	23	63	67	16	3	0
	Plasterer	2	12	0	14	4	10	11	3	0	0
	Signal man	8	60	2	66	21	47	55	13	0	0
	General worker	29	416	4	441	86	359	398	43	3	1
	Machine operator	10	26	1	35	7	29	28	8	0	0
	Mechanic	10	22	6	26	19	13	19	8	3	2
	Surveyor	1	19	0	20	4	16	19	1	0	0
Remark		$p < 0.05$		$p < 0.05$		$p < 0.05$		$p < 0.05$			
Role	Worker	136	957	37	1056	298	795	898	175	14	6
	Ganger	7	33	1	39	15	25	31	7	2	0
	Foreman	8	37	1	44	16	29	32	13	0	0
Remark		$p > 0.05$		$p > 0.05$		$p > 0.05$		$p > 0.05$			

4.   DISCUSSION AND CONCLUSIONS

Excessive alcohol consumption has negative implications for construction workers' overall health, productivity, and safety performance. An open secret is that alcohol use in the workplace is rather prevalent among construction workers. However, currently there are few empirical studies on alcohol use and impairment in construction workers, let alone alcohol use on the job. Using the World Health Organization AUDIT, the research team carried out an alcohol consumption pattern survey with a convenience sample of railway project construction workers based in Hong Kong. The results show that alcohol consumption is prevalent in construction workers, despite the negative implications of alcohol use and impairment for employees' safety and productivity. 81.5% of the respondents engage in low-risk drinking and are in need of alcohol education. 16.6% of the respondents engage in excessive drinking and are in need of a combination of simple advice and alcohol education. 1.4% of the respondents engage in hazardous and harmful drinking and need a combination of simple advice, brief counselling and continued monitoring. 0.5% of the respondents should be referred to a specialist for diagnostic evaluation and possible treatment for alcohol dependence. Furthermore, 12.8% of the respondents are drinking in a hazardous way, 3.4% of the respondents are experiencing alcohol dependence, and 28% of the respondents are drinking in a harmful way.

The results of Chi-square tests suggest that construction workers' drinking patterns differ depending on their gender, ethnicity, age and trade. There seems to be no significant difference regarding drinking patterns among foremen, gangers, and workers.

Although this survey is about construction workers' drinking patterns off-the-job, it indicates that to reduce alcohol use on construction sites, efforts should be made in two (02) aspects: the work environment and the interventions. A work alienation/stress paradigm stands out among theories that account for workplace alcohol use (Frone, 1999). The paradigm views employee alcohol use as a direct or indirect response to physical and psychosocial qualities of the work environment. Therefore, creating an alcohol-free construction site needs upgrading both physical and psychological qualities of the site. A successful intervention is supposed to have six (06) elements, i.e., feedback of personal risk or impairment, emphasis on personal responsibility for change, clear advice to change, a menu of alternative change options, therapeutic empathy as a counselling style, and enhancement of client self-efficacy or optimism (Bienet *et al.*, 1993). Interventions that feature these six elements are supposed to be most effective.

No single procedure is universally suitable for early identification of harmful drinkers (Babor *et al.,* 1989). This research used self-report questionnaires as the primary screening tool, which may underestimate the prevalence of alcohol use among construction workers. This should be taken into account when interpreting the results. An alcohol-detection tool to test whether workers drink, such as breath alcohol sensor, may produce a more accurate estimate.

5.   ACKNOWLEDGEMENT

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