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Research Article

Workplace Drug Testing among Security Guards Using Urine Drug Tests, Cross-section Study.

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Abstract: The objective is to study the prevalence of drug abuse among a sample of security guards through workplace drug testing, using a pre-employment urine drug test. A cross-sectional study was carried out on 122 security guards during their pre-employment examinations in a private health care hospital in SA during the period March to December; 2013.All participants provided urine samples which were screened for drugs. All positive screening tests were confirmed using gas chromatography-mass spectrometry. 10.7 % of the participants had positive tests, of which 69.2% were positive for THC and the remaining were positive for amphetamine. All security guards with positive urine drug test results were males and current smokers compared to those with negative urine drug test results (84.4%, 48.6%) ($P < 0.05$). This study shows a high prevalence of drug urine test positive results among security guards which should be further studied using a case-control study design and a large sample size. Health education and employee assistant programs are recommended to prevent and control drug abuse among security guards.
Keywords: workplace, drug, security guards, urine.

INTRODUCTION

Security has been identified as one of the fastest growing occupations worldwide [1]. Security guards are privately and formally employed civilian personnel who are paid to protect property, assets and/or people. They are generally uniformed and act to protect property by maintaining a high visibility presence to deter illegal and inappropriate actions, observing for signs of crime, fire or disorder; then taking action and reporting any incidents to their clients and emergency services as appropriate[2-4].

Security guards are more exposed to work place violence in comparison to the general workforce and this can affect their psychological and mental health[5-7]. On the other hand, security guards could be involved in violence, aggression and crime against civilians[2, 8]. Different studies reported several risk factors which could explain the involvement of security guards in violence and crime, including psychological and mental health problems, stress, shift work, sleep disturbance and drug abuse[1, 4, 8-11].

Drug abuse is likely to occur among security guards to stay awake at night, and is also a known coping method for stress [4]. Doubtless, drug abuse is considered as a danger to health and safety for both drug users and non-users; and could be an important risk factor for involvement of security guards in violence and crime. Workplace drug testing (WDT), especially pre-employment urine drug testing, is considered a preventive strategy to achieve drug-free workplaces through urine screening for different drugs, including barbiturates, opiates, benzodiazepines, propoxyphene, meperidine, tetrahydrocannabinol (THC), amphetamines, cocaine, phencyclidine, and phenothiazines[12-14]. Occupations subjected to WDT are professional driving and other jobs within rail, road, water and air transport, oil/gas pipeline and explosives/fireworks sectors[12, 15, 16]. Little is known about the prevalence of drug abuse among security guards, so the objective of the current work was to study the prevalence of drug abuse among a sample of security guards through WDT using pre-employment urine drug tests.

METHODS

A cross-sectional study was carried out on a sample of 200 newly hired security guards, who were randomly selected from the study population of 433 during their pre-employment examination in a private tertiary health care hospital in SA during the period March to December, 2013.

All participants were subjected to medical and occupational history taking and a medical examination.

They were informed that they would be tested for drugs, on the day of the examination. All participants provided urine samples which were screened using On-Site CupKit501, for the following drugs: THC, Amphetamine, Benzodiazepines, Barbiturates, Opiates (morphine, codeine, dihyrocodeine), and Cocaine (benzoylecgonine). All positive screening tests were confirmed using gas chromatography-mass spectrometry (GC-MS) (GC 3800/MS Saturn 200, Varian, USA) using methodology found elsewhere in the literature [14, 17]. The cut-off values [12, 15] for each drug test are presented in table 1. All participants were examined by a medical review officer and all were informed of the results. A decision of fitness for the duty was made for each participant based on the results of the pre-employment urine drug test result.

Table 1- Cut-off values (ng/ml) for urine drug testing

Test	Drug classes					
	THC	Amphetamine	Benzodiazepines	Barbiturate	Opiates	Cocaine
Screening: (ng/mL)	50	1000	150	200	2000	300
Confirmation: (ng/mL)	15	250	150	200	300	150

Statistical analysis

All data were analyzed by SPSS version 17, using Chi-square and Fisher's exact tests for qualitative data and student-t tests for quantitative data. Differences were considered significant when the p value was less than 0.05 and highly significant when the p value was less than 0.01.

All data were kept and processed confidential. All participants wrote written consents and the research was approved from the hospital research ethics committee.

RESULTS

Only 122 of the 200 security guards agreed to participate (61.0%) and they had a mean age of 28±4.7 years with work experience as security guards of 3.5±3.1 years. Also, they were mostly males (86.1%), half of them were single, most of them had secondary education level (71.3%) and more than half of them were current smoker (54.1%) (Table-2). Out of 122 security guards, 10.7 % (n=13) had positive urine drug tests. THC was detected in 7.4% (9/122) and amphetamine was detected in 3.3% (4/122) of the total samples.THC was detected in about two thirds (69.2%) of the total positive urine samples for drugs and the remaining third was positive for amphetamine (Table 3).

All of the security guards with positive urine drug test results were males (100%), most of them were single (84.4%), and their mean age was 22.8 years, compared to those with negative urine drug test results (84.4% were male, 46.8% were single, and the mean age was 28.6 years) ($P < 0.05$).

About a third (30.8%) of the security guards who tested positive for drugs had an elementary level of education. However, all the security guards who tested negative for drugs had secondary or high school levels of education ($P < 0.05$). All security guards who tested positive for drugs were current smokers (100%) and had a lower duration of work as security guards (1.7± 1.2 years), compared to those who tested negative for drugs (48.6% and 3.7±3.2 years; respectively); the difference was statistically significant (Table 4).

Table 2: Demographic information of the participants

variable	mean	SD
-Age: (years)	28.0	4.7
-Work experience as security guard: (years)	3.5	3.1
	N	%
-Gender		
female	17	13.9%
male	105	86.1%
-Marital status		
single	62	50.8 %
married	60	49.2 %
-Education		
elementary	4	3.3%
secondary	87	71.3%
high school	31	25.4%
university	0	0.0%
-Smoking		
non-smoker	54	44.3%
current smoker	66	54.1%
ex-smoker	2	1.6%

Table 3: Distribution of drugs detected in the urine samples provided by the security guards

Drug classes	N and % of all test	N and % of positive tests %
THC	9 (7.4)	9 (69.2)
Amphetamine	4 (3.3)	4 (30.8)
Benzodiazepines	0(0.0)	0 (0.0)
Barbiturates	0(0.0)	0(0.0)
Opiates	0(0.0)	0(0.0)
Cocaine	0(0.0)	0(0.0)
Total	122 (100.0)	13 (100.0)

Table 4: Demographic criteria of security guards tested positive and tested negative for drugs in their urine samples

variable	Negative for drugs N=109		Positive for drugs N= 13		P value
	mean	SD	mean	SD	
Age (years)	28.6	4.4	22.8	3.5	0.001
Past experience as security guard (years)	3.7	3.2	1.7	1.12	0.03
	N	%	N	%	
Gender					0.04
female	17	15.6	0	0.0	
male	92	84.4	13	100.0	
Marital status					0.01
single	51	46.8	11	84.6	
married	58	47.5	2	15.4	
Education					0.001
elementary	0	0.0	4	30.8	
secondary	78	71.6	9	69.2	
high school	31	28.4	0	0.0	
university	0	0.0	0	0.0	
Smoking					0.002
non-smoker	54	49.5	0	0.0	
current smoker	53	48.6	13	100.0	
ex-smoker	2	1.8	0	0.0	

DISCUSSION

Drug abuse has become a worldwide problem and is considered a threat to the health and safety of both drug user and non-user [12, 14]. Hence, WDT has become a very important screening tool to detect drug use by employees or candidates for different job categories performing duties with a high potential threat to the community, including security guards [17].

Our study revealed that 10.7% (n=13) of the studied security guards had positive urine drug test result and all of them were males. There is very little information about the prevalence of positive urine drug test results among security guards using both screening and confirmatory tests. A recent study [4] reported that one-fifth of the studied security guards had substance abuse, but it did not analyze drugs in their urine samples; instead the study used a screening questionnaire called Simple Screening Instrument for Alcohol and Other Drugs (SSI-AOD) which is not an accurate tool compared to the drug urine assay that we used in the present work [18].

Higher prevalence of positive urine drug test results have been reported in security guards (10.7%) compared to other occupations such as truck drivers (9.3%) and professional drivers (6.1%); however, both security guards and drivers showed positive tests for THC, amphetamine [15, 19]. Police applicants showed 0.24 to 1.95 % drug-positive urine analysis; and working police officers showed 0.12 to 0.55 % drug-positive urine analysis [20]. According to a drug testing programme that was conducted in the Finnish defense forces, military personnel showed no positive urine drug test which was explained by the existence of a successful anti-drug strategy [21].

Santoro et al. reported that 0.7% of a sample of Italian workers performing hazardous work had positive urine drug test results[22]. However, they reported that more positive cases might be found by performing short-notice random testing. Kazanga et al. carried out a study to examine and elaborate WDT data collected on different groups of workers involved in

public/private transportation, oil/gas companies, and the explosives/fireworks industry. The positive rate was 2.0% and THC was the most frequent drug detected, followed by cocaine and opioids [12]. Pre-employment drug testing of health care workers (HCWs) revealed a wide range of positive tests from 0.25% to 12% for different drugs, including marijuana metabolites, cocaine and opiates cannabinoids (THC) and amphetamine [13, 23-25].

It is difficult to discuss our results among security guards with reference to other occupations, such as drivers due to different work environment. However, the relatively higher prevalence of positive drug test results in our study might be due to the fact that the examined security guards had been informed that they would be tested for drugs on the day of the examination so they did not have chance to practice abstinence from drugs to avoid positive tests. Moreover, it is difficult to compare our results to the community because of the scarcity of epidemiological studies assessing the prevalence of substance abuse or dependence in Saudi Arabia[26].

Working as security guard is considered a high risk for developing stress and it has been reported that security guards have the highest percentage (65.7%) of extensive job stress of all professions [4, 7]. Working as a security guard entails dealing with different people, shift work [1, 11], sleep disturbances and mood disturbances [27, 28]. Furthermore, stress could increase the risk of developing mental health problems among security guards [2, 4, 5, 9, 29] which may lead to violence and aggression [5, 8, 10].

The present study revealed that, in comparison to the security guards with negative drug urine test results, security guards who tested positive for drugs were single, younger, more poorly educated, and males, which could be considered as risk factors for developing stress [6, 9, 30-36] and mental health problems, including substance abuse [5, 9]. This could explain the higher prevalence of confirmed positive drug test results among security guards in the present work (10.7 %) which is supported by other studies that found an association between working as a security guard and substance abuse, career burnout and mental health problems [6, 8, 10].

All security guards who tested positive for drugs in our study were current smokers (100%). This is in concordance with other studies that reported an association between smoking and substance abuse. The majority of individuals seeking treatment for substance abuse disorders are cigarette smokers [37-39]. All security guards who tested positive for drugs in our study were males, which is in agreement with other studies [12, 15, 24].

WDT can be performed using different biological specimens, including urine, hair, blood, saliva and breath but we used urine sampling as it is noninvasive, fast and it detects the recent use of drugs [40]. Nevertheless, one negative test certainly does not rule out substance abuse as abstention from use for three days will often produce a negative test result; nor can one positive result diagnose addiction, abuse, intoxication, or impairment [13, 40]. In the present work, both screening and confirmatory tests using gas chromatography– mass spectrometry (GC-MS) were performed for all participants which is considered a strength of the study to avoid false-positive results which are possible due to cross-reactivity with metabolites of other prescription or over-the counter drugs [14, 17]. Although the urine test is the most common test used for WDT, many authors have recently reported that analysis of hair provides a much longer window of detection - up to 3 months - so it is more specific than urine test with fewer false negative test results [13, 17, 20, 40]. It has been shown that that within the same job category, hair testing can detect twice as many drug users as urine testing. However, hair assays cannot detect drugs until typically 3 to 5 days after ingestion [20, 40].

Our study has certain limitations such as the relatively small size sample and low participation rate; and psychological assessment of the studied security guards has not been conducted. We recommend performing WDT for security guards, including pre-employment testing, random testing and after accidents or for-cause testing. This will deter drug abuse among security guards, thereby protecting their health and safety, increasing productivity, and reducing the incidence of violence and aggression either against them or induced by them towards the community. Moreover, stress management programmes and smoking cessation programmes should be organized for security guards by employers to assure their well-being.

CONCLUSION

In conclusion, the present study showed that 10.7 % of the studied security guards had positive drug urine test results and they were young, had lower education level, were males and smokers. Nevertheless, more in-depth studies with larger sample sizes should be conducted to investigate the association of work stress and drug abuse among security guards. WDT using urine samples is still the most common test in industrial settings; however, recent studies report that using hair assays provide more specificity and a longer window of detection compared to urine tests. WDT and stress management programmes should be practiced for security guards to assure health and safety, both for them and the community.

Lessons learned

- Security guards are at risk for work stress which may lead to drug abuse and violence

- Workplace urine drug testing is a good preventive strategy to achieve drug-free workplace and to provide support and assessment to employees who has drug abuse

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