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THE USE AND EFFECTS OF CANNABIS AMONG CONSTRUCTION WORKERS IN SOUTH AFRICA: A PILOT STUDY

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There is increasing concern regarding the impact of the consumption of cannabis within the construction industry. Empirical evidence highlights issues of cannabis use and its connection with health and safety risk on construction sites. This study explores the use of cannabis and its behavioural, perceptual, physiological, emotional and cognitive effects on construction workers. The study further explores the decriminalisation of its private use and personal consumption in South Africa. The paper was developed based on a review of empirical and theoretical studies previously published in a wide range of journals and commissioned reports. Literature relating to drug and substance use in the construction workplace was obtained from research databases. The keywords "cannabis" and "construction industry" were used to search the databases. Of the number of related articles found, a total of 41 articles and reports were cited in the study. The study revealed that cannabis use has both short and long-term health effects on brain development and plays a significant role in the progression of respiratory diseases. Furthermore, the after effects of the use and abuse of cannabis by construction workers pose numerous threats to the workplace safety of the construction industry. The paper identified loss of concentration and low productivity on site, abnormal and irrational behaviour, absenteeism from work and poor work quality as impacts of cannabis use on construction sites. A pilot study was also conducted to further test the instrument based on the sensitivity of the topic and as a basis for the ongoing empirical study although the responses were invalid. Based on the literature findings, the study identifies the need for site supervisors and construction employers to introduce improvement mechanisms and appropriate intervention programs to control the use of cannabis on construction sites.

Keywords: cannabis, construction site workers, health and safety, substance use, South Africa

INTRODUCTION

The construction industry is generally regarded as one of the most stressful industries to be employed in. Emotional and physical responses to this stress occur

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when there is tension between the demands of work activities and environment and the pressure on construction workers to satisfy these demands (Bowen et al., 2014). These consequences and effects have been characterised as being behavioural, perceptual, physiological, emotional and cognitive (Oraegbune, Adole and Adeyemo, 2017). To alleviate these effects construction workers have been found to resort to the use of psychotropic drugs that act as psycho-stimulants such as cannabis (Oraegbune et al., 2017). Some of these effects include headaches, shortness of breath, dizziness, nausea, muscle tension, palpitations, loss of appetite, crying, smoking, overeating, lack of concentration, and ability to get work done (ibid). Cannabis use and its effect on cognition in workplace context and everyday life and whether it's use off-site endangers a worker and his colleagues while on-site are of concern (Phillips, Holland et al., 2015); Goldsmith et al.,2008).

Globally, cannabis is the most commonly consumed psychoactive drug under international control (WHO, 2016). In 2014, some 183 million people between 16 and 54 years' globally, were found to be users of non-medical cannabis (UNODC, 2016); (WHO, 2016). Disorders and health conditions associated with cannabis are widespread across high and middle-income countries particularly in countries of Western and Southern Africa (about 5 million in the latter) and are of primary concern (UNODC, 2004). Men are three times more likely to use cannabis (UNODC, 2016). The proportion of people in treatment for cannabis abuse in South Africa rose from around 5% in 1996 to around 20% in 2002 (UNODC, 2004). In a household survey of 4,000 adults, aged 18 years and above, conducted by The South African Stress and Health Study (SASH), 8.4% lifetime use of cannabis was found. Bhana (2015) argued that in South Africa, females were less likely to use cannabis compared to males and urban dwellers were more susceptible to use the substance than their rural counterparts. A study conducted in the USA reported in 2010 found that 12.3% of construction workers between the ages of 18 and 50 admitted to using illicit psychotropic drugs (Golaik, 2010).

Although a great deal is known about cannabis and its use, little is known about its consumption on construction sites in South Africa. There is an increasing concern on the use of cannabis, and this has been further aggravated by the legalisation of cannabis in South Africa. The effects of cannabis are detrimental to the health of construction workers and overall pose health and safety risks. This study seeks to explore the impacts of cannabis use by construction workers in the industry. The study further explores the decriminalisation of its private use and personal consumption in South Africa, in view to increase awareness among construction workers.

LITERATURE REVIEW

What is cannabis?

Cannabis is a generic term used to denote the tobacco-like greenish or brownish material made up of the dried leaves, flowers, stems and seeds from the Cannabis sativa or indicia (hemp) plants (UNODC. 2007). It is also referred to by the World Health Organization as an existing natural drug (UNODC, 2016). Marijuana, hashish and hash oil are the most common preparations of cannabis (WHO,2016). Cannabis resin or "separated resin" is the crude or purified secretion of the flowering tops of the cannabis plant, which is made into a powder or pressed into slabs or cakes and

used in the preparation of marijuana (UNODC, 2007). Cannabis oil or "hash oil" is a liquid extracted from either the dried plant material or the resin (ibid).

Legalization of cannabis

The legalisation of the personal use of cannabis also known as weed or marijuana in South Africa by the Constitutional Court on September 18, 2018, presents a challenge for the construction industry where its use has been covert or clandestine and in many cases seen to be synonymous with high levels of productivity on sites (Nel, 2018). The ruling legitimises the possession, purchase and cultivation of cannabis which is also a psychotropic drug for personal use by an adult in a private dwelling (ibid). South Africa is not the first country in the world to have taken this step. Others include Canada and Portugal (Possi, 1996), parts of the USA, Belize, Jamaica, Spain, Australia, Argentina, Uruguay, Cambodia, Belgium, Netherlands, Portugal, Switzerland and the list is growing

Health Effects of cannabis

Cannabis is a psychotropic drug that affects and alters brain activities associated with mental processes, perception and behavior. Psychotropic drugs are also referred to as psychoactive, psychotherapeutic or psychoactive. More particularly, cannabis is a psychoactive drug. As such, it is a chemical substance that acts primarily upon the central nervous system where it alters brain function, resulting in temporary changes in perception, mood, consciousness and behavior (Kosen and O'Connor, 2003). Cannabis also acts as a psycho-stimulant where it elevates the mood, produces feelings of excitement, alertness, attention, energy and euphoria. A crash usually follows this elevation Elshohly and Gul, 2014).

Delta-9-tetrahydrocannabinol (TCH), cannabidiol (CBD) and cannabinol (CBN) are the principal cannabinoids in cannabis (Bowel et al, 2014). THC is the primary psychoactive compound that is responsible for the manner in which the brain and body of a user react to cannabis and is responsible for the psychoactive effects sought by users (Bowen et al., 2014); (Iversen, 2007). It is argued that cannabinoids have potential therapeutic benefits such as, for example, for management of spasticity in multiple sclerosis or nausea in cancer chemotherapy (Ratini, 2018).

Short-term effects on the brain and body

Short-term effects of cannabis use occur immediately after a single administration and magnitude of these effects typically depend on the dose taken, route of administration, users' mindset and previous experience of the user with cannabis (Fehr and Kalant, 1983).

Intoxication is the most common short-term effect of cannabis. It is usually evident by troubles with consciousness, cognition, perception and other psychophysiological functions. (WHO, 2016). The use of cannabis is reported to possibly involve psychotic episodes, suicidal behavior and adverse health problems such as stroke. These generally are severe mental disorders that cause abnormal thinking and unrealistic perceptions. Consequently, people with psychoses lose touch with reality (Wang,Derakhahandeh et al.,2016); (Thomas, Kloner and Rezkalla, 2014); (Galli, Sawaya and Friedenberg, 2011).

In terms of impairment, Delta-9-tetrahydrocannabinol (THC) affects;

- Co-ordination;
- Reaction time;
- Change in sense of time;
- Ability to pay attention;
- Decision-making abilities; and
- Ability to judge distances.

Impairment can last for more than 24 hours after the use of cannabis which is long after the other effects have faded (Leirer, Yesavage and Morrow,1991). One of the consequences in regular users could be the difficulty with skills needed to drive safely for weeks after their last use because cannabis smoking increases motor vehicle accident risk (Karschner et.al, 2016).

Long-term effects on the brain and body

Development of long-term health effects of cannabis use typically arise from regular intake –over a period of months and years. The frequent use of cannabis has also been linked to an increased risk of psychosis, suicide, depression and anxiety disorders. If a person smokes cannabis daily the risk of addiction has been found to be between 25% and 50% (Volkow et al.,2014). Cannabis addiction has been found to lead to, inter alia;

- Absenteeism and failing to execute major tasks and duties at work;
- Giving up important activities because of cannabis use;
- Unintentional increased frequency of use in larger doses; and
- Inability to reduce or control the use of cannabis (Zwerling, Ryan and Orav, 1990).

Ways of using cannabis

The main ways of using cannabis are through smoking (inhalation), by hand rolling cigarettes, eating or drinking (ingestion). In the case of smoking which includes vaping, cannabis begins to work fastest as THC is carried to the brain in the bloodstream and a user may start to feel 'high' within seconds or minutes (Hall, Degenhardt and Teesson, 2009). Cannabis is deeply inhaled, and smokers hold their breath for maximum absorption of THC by the lungs. The amount of THC peaks in about 30 minutes and then fades after one to four hours. When cannabis is consumed or ingested the effects are slower than if smoked. Typical periods before the onset of the 'high' feeling are between 30 minutes and two hours. The after effects last up to eight hours.

Reported therapeutic benefits of using cannabis

Several therapeutic benefits for the use of cannabis for medicinal reasons have been reported as, for example;

- Feeling of relaxed well-being and heightened senses making colours appear brighter;
- Increased sociability;
- Muscle relaxant in the case of stiff muscles or muscle spasms from multiple sclerosis;
- Analgesic effect to relieve ongoing pain which is most common use for medical cannabis;

- Help with sleep problems in persons suffering from fibromyalgia and sleep apnoea;
- Appetite stimulation in cases where persons with AIDS suffer with loss of appetite and weight loss;
- Antiemetic effect which prevents vomiting such as from chemotherapy;
- Anticonvulsant effect; and
- Lower intraocular pressure, namely pressure in the eye (Ratini, 2018).

Reasons for using cannabis on construction sites

Several reasons have been posited for the use of cannabis as a drug on construction sites. These reasons directly or indirectly relate to the working conditions on job sites or the workers themselves Mushi and Manege (2018). Researchers have identified several reasons for using cannabis. Fardhosseini and Esmaeili (2016); Miller, Zaloshnja and Spicer (2007) highlighted the relationship between abnormal shifts, work related stress, job insecurity and drug abuse. The stressful and dangerous nature of construction work can also play a major role in the intake of drugs by construction workers (Biggs and Wilkinson, 2012).

A study conducted in Nigeria found the following:

- 85% of construction workers depended on psychotropic drugs for productivity;
- 90% of construction workers claimed that they could not work for long periods at a time;
- 93% of construction workers reported that the quality of work deteriorated; and
- 73% reported that workers abused psychotropic drugs on site (Bowen et al., 2014).

Possible signs of having used cannabis

In order to control the use of cannabis it is vital that management and site security are able to detect the symptoms of use. There are many tell-tale signs that could alert to the use of cannabis by workers and them still being 'high.' However, these signs also might be indicative of the use of other substances that include alcohol or strong medication (Leirer et al, 1991). These signs include the worker having or demonstrating, inter alia: glassy red eyes, poor muscle and limb co-ordination, delayed reaction time, increased appetite, mood swings, abrupt symptoms of anxiety, panic or hallucinations (Meier et.al, 2012).

Threats to the construction industry

According to a recent study, 15.1% of construction workers used drugs. In another study of 150 construction workers between the ages of 20 and 40 years, the widespread use of cannabis was found because it was inexpensive and easily obtainable (Mushi and Manege, 2018).

Given that the aftereffects of the use of cannabis last for many hours, it is likely that construction workers who have used cannabis at home or off-site could come to work feeling high. Consequently, they do not only place themselves at risk on construction sites but also their fellow workers. There is emerging research into the effects of second-hand exposure from a cannabis smoker, for example, nearby

(Herrmann, Cone, Mitchell, Bigelow, LoDico, Flegel and Vandrey, 2015); (Cone, Bigelow, Herrmann, Mitchell, LoDico, Flegel, and Vandrey, 2015). In South Africa, the Constitution which is the overarching piece of legislation in the country stipulates that employees are entitled to a working environment that does not present a threat to their health and safety. This entitlement is captured in the Occupational Health and Safety Act of 1993 as amended, concerning which employers must ensure a working environment for all their workers that do not present a threat to their health and safety (Nel,2018). The Construction Regulations of 2014 requires the development, implementation, monitoring and review of the site- and project-specific health and safety plan to manage the health and safety aspects of the construction project (Cone et al, 2015). This plan would incorporate the provisions of several policies that should include a substance abuse policy. This policy should ideally be a 'zero tolerance' one with clear censures for non-compliance with its provisions.

Impact on construction sites

The use and abuse of cannabis by construction workers, given the likelihood that its use will be more visible and brazenly open particularly in South Africa after the court ruling will lead to several impacts on construction projects and eventually the sector unless its use on-site or after effects from use at home or off-site are controlled on-site in the workplace (Herrmann et al, 2015). These include;

- High rates of absenteeism by workers who use cannabis and have after effects from use before coming to work;
- Loss of productivity on site because of the lasting effects of use off site;
- Violent and unpredictable behaviour that could even include petty crimes such as theft and pilfering to fund the cannabis habit;
- Steadily decreasing work quality resulting in unnecessary rework;
- Increasing inability to pay attention and concentrate for any length of time;
- Needless risk taking threatening workplace safety and the safety of fellow workers on site; and
- High labour turnover with the associated recruitment costs especialy since the industry suffers from a chronic skills shortage. (Laad, Abdul, Chaturveli and Shaikh, 2013); (Ntili, Emuze and Monyane, 2015); (Biggs and Williamson, 2012); (Pidd, Roche and Buisman-Pijlman, 2011).

Paraphernalia and hideaway places

Cannabis users will be 'inventive' to conceal their cannabis-related activities on construction sites (Mushi and Manege, 2018). For example, the following paraphernalia, inter alia, could be found on site, namely; rolling papers, pipes such as glass top of bottles, cigar papers with their content emptied and edibles with green hue.

Examples of places where cannabis users will hide cannabis on site include the following, namely; in cavities and crevices, carved out spaces at the top of doors, over-the-counter medication packages to avoid detection, cool drink cans, suspended ceiling space, water bottles, clothing, toolboxes, hammer handles and in spirit levels to mention a few (Mushi and Manege, 2018; Meier et al, 2012).

METHODOLOGY

Extensive review of literature was reviewed on the topic to identify the effects of cannabis on construction workers. Keywords such as "cannabis use", "drug use on sites", "health effects", "construction", "workers" were used to search multiple databases until the year 2018. A pilot study was conducted through the use of self-administered close-ended questionnaire developed from an extensive review of literature on the topic. The study adopted a quantitative research approach, and purposively sampled 11 contractors in the KwaZulu-Natal province of South Africa. According to Johanson and Brooks (2010), the sample for a pilot study should be 10% of the estimated sample for the larger study and for the actual study, the sample size shall be 100 contractors. Due to time constraints and the sensitive nature of the study, a relatively small sample population was obtained. Findings presented in this paper form part of an ongoing empirical research. Data obtained was captured and computed using IBM SPSS version 25.0. Descriptive statistics consisting of means, percentage and standard deviation were used to analyse the data obtained. To ensure the reliability of this study, the Cronbach's coefficient alpha was used to test the reliability of the scaled questions. Only reliability of the construct was reported in this study.

DATA ANALYSIS AND FINDINGS

Reliability Statistics

To test for reliability, the study used the Cronbach's alpha coefficient which is the most widely used measure for internal consistency (Trochim, 2006). The Cronbach alpha coefficient is based on numbers from 0 to 1, and the closer the score is to one, the more reliable the results. Table 1 shows the Cronbach's Alpha reliability coefficients based of respondents' knowledge about cannabis. All scale factors with a coefficient above 0.70 are regarded as reliable.

Table 4.1: Cronbach's Alpha reliability statistics coefficients

Knowledge of Cannabis Use (Variables)	Cronbach's Alpha
Availability of cannabis	0.70
Attitudes towards cannabis consumption at work	0.73
Health effects of cannabis intake	0.93
Methods of cannabis intake	0.91

Participant demographics

Table 4.2 presents the demographic information of respondents who participated in the study. Majority of the respondents were male (90.9%) while 9.1% were female. Participants in the study occupied positions of laborer (27.3%), artisan (54.5%) and other positions (18.2%). Respondents were further required to specify how long they had worked in the construction industry as well as their highest formal qualification. It is evident from Table 1 that majority (45.5%) of the participants had less than 5 years' work experience in the construction industry. Furthermore (90.9%) indicated that their highest level of formal education was upper secondary education.

Table 4.2: Demographic characteristics

Demographic Characteristics	%
Male	90.9
Female	9.1
Position	
Laborer	27.3
Artisan	54.5
Others (managers, supervisor)	18.2
Period of work in construction	
≤ 5 years	45.5
≤ 10 years	27.3
≤ 35 years	9.1
≤ 40 years	9.1
Highest Formal Qualification	
Upper secondary (Technical/Vocational)	90.9
University Degree	9.1

Availability of cannabis

This section sought to investigate the knowledge of respondents regarding the availability of cannabis in their environment. Participants were required to indicate areas where they perceived cannabis to be readily available using a Five-point Likert scale, ranging from 1= Never to 5= Always. They were also given an option to indicate if they were unsure. Findings showed that respondents perceived cannabis to be mostly available in the townships (63.6%) and from drug merchants (54.5%). The study found that participants were unsure about the availability of cannabis at work, pub bars and disco houses. It was evident that respondents were unaware or unsure about the availability of cannabis in the work.

Attitudes towards cannabis consumption at work

Respondents were required to indicate their level of agreement to whether it was appropriate to use cannabis for construction work using a Five-point Likert scale, ranging from 1= strongly disagree to 5=strongly agree and unsure. Majority of the respondents displayed a high level of uncertainty regarding the suitability and acceptability of cannabis consumption before and while undertaking construction work.

Frequency of cannabis use

Relative to being asked about how often the respondents consumed cannabis for construction work, majority of the respondents (72.7%) indicated that they had never used cannabis during their construction activities while some respondents did not answer.

Health Effects of Cannabis use

This section required participants to indicate their knowledge of the long and short term effects of cannabis use by indicating their level of agreement to a variety of cannabis health effects by using a Five-point Likert scale, ranging from 1= strongly

disagree to 5=strongly agree and unsure. About 85% of the participants responded that they were unsure or did not know whether the use of cannabis caused any of the specified health effects. Noteworthy, is the fact that the remainder of the respondents disagreed with these health effects.

Methods of cannabis intake

Respondents were required to rate how they used cannabis through a variety of methods such as sniffing, pipe, chewing, swallowing, injecting and cigar like sticks using a Five point Likert scale ranging from 1= Never to 5= Always and unsure. Responses ranged from Never to unsure. Majority of the participants indicated that they did not take cannabis through any of the methods specified. While 10% agreed to using cannabis using cigar-like sticks (referred to as Joint).

DISCUSSION

Several challenges arise from the court ruling. These include what constitutes private use. Technically, if someone in possession of cannabis steps outside of their home, retains the substance in their pocket and it is for personal use they have not broken the law. Possession in itself would no longer carry the previous legal censure. Further, allowing people to purchase marijuana would amount to the court sanctioning dealing in the substance. Should the user want to grow their cannabis, they would have to purchase the seeds or small plants from another party who would be deemed to be a dealer in marijuana which is still an illegal practice. The purchaser would be an accomplice to dealing in cannabis. A decision by the South African government would need to be made about what quantities are allowed per person strictly for personal use.

CONCLUSION AND RECOMMENDATIONS

This study reported findings on the impacts of cannabis use on construction sites based on literature. Furthermore, a pilot study was conducted to seek clarity on the type of questions asked, how respondents relate, their sensitivity in order to redesign a better instrument and obtain reliable responses. Based on the findings of the pilot study, it was evident the responses were not reliable based on the inconsistency in answering certain questions. Respondents denied ever using cannabis although some agreed to having used one or more methods of intake. Moreover, most participants responded unsure in more than 50% of the questions in the instrument. However, overall reliability was above 0.70 based on the Cronbach's Alpha coefficient. Although reliable, the validity of the study is very low based on the type of responses.

They further suggest that it is necessary to determine the impact of the recent court ruling on the use of cannabis on construction sites in South Africa as well as the challenges that it presents to construction health and safety and their management. An amendment of the current construction health and safety legislation and regulations might be needed which requires a substance abuse policy to be provided and explicitly implemented on all construction sites.

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