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ORIGINAL ARTICLE

Impact of Workplace Stress on Addictive Behaviors among Workers in a Tunisian Petroleum Industry

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Main Points

The main points of this study are:

- Focus on occupational stress: The study investigates the relationship between occupational stress and health-related behaviors, specifically smoking, alcohol consumption, and caffeine intake, among Tunisian onshore oil workers using validated tools.
- Addictive behaviors linked to stress: The findings reveal that low social support is significantly associated with smoking behaviors (OR = 2.65), suggesting that psychosocial factors play a crucial role in how workers cope with stress.
- Call for interventions: The research underscores the need for targeted workplace interventions aimed at reducing occupational stress and promoting healthier behaviors to improve overall worker well-being and productivity in the Tunisian oil sector.

Abstract

Occupational stress is one of the major health hazards of the modern workplace. It has been linked to a poor mental health and increased rates of addictive behaviors on and off the job. This remains relatively unexamined, especially in the Tunisian working environment, where it is the first time that this specific issue is being studied. The objective was to investigate and explore the correlation amid occupational stress, health-related behaviors of smoking/alcohol usage, and caffeine consumption among Tunisian onshore oil workers. A cross-sectional survey was conducted among 94 onshore oil installation workers of a Tunisian private oil company over a period of 6 months from January to June 2018. They were investigated with a self-administrated questionnaire about sociodemographic characteristics and health-related behaviors. Workplace stress was evaluated with job content questionnaire. Smoking dependence was assessed via the Fagerström score and the motivation to quit by Richmond test. Alcohol consumption was measured by the questionnaire of fast alcohol consumption evaluation. Data were analyzed using SPSS and $p < .05$ was considered statistically significant. This cross-sectional study included exclusively male workers with an average age of 41.17 years. The majority of employees were married (72.6%). Almost the half had a high level of education. An average of professional seniority was about 14.03 years. Of 94 workers, 33 (35.1%) were current smokers and 18 (18.9%) were current drinkers. The average caffeine consumption was 277.22 ± 153.638 mg/day. Job strain and iso-strain were respectively noted in 48.9% and 27.7%. The statistical analysis indicated that current smoking was significantly associated with low social support with an OR = 2.65 (95% CI [1.034 – 6.802]). The findings indicate that a substantial proportion of workers experience high levels of job strain and iso-strain, with 48.9% and 27.7%, respectively. These conditions are known to contribute to adverse health outcomes, including mental health issues and increased addictive behaviors. The significant association between low social support and current smoking (OR = 2.65) underscores the role of psychosocial factors in addictive behaviors. This aligns with existing literature that suggests individuals under stress may resort to smoking as a coping mechanism, reflecting a broader trend observed in various occupational settings. The prevalence of smoking (35.1%) and alcohol consumption (18.9%) among the participants is concerning, particularly given the high-stress environment of the oil industry. These behaviors not only pose direct health risks but

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can also impair job performance and safety. These data provide evidence that petroleum workers are exposed to a monotonous lifestyle in the workplace, leading to high psychosocial risks. In response to varying levels of stress, employees may adopt different addictive behaviors. All above mentioned factors can directly or indirectly threaten the workers' health and work productivity.
Keywords: Addictions to alcohol, addictions to tobacco, occupational stress, onshore oil workers, social support

Introduction

Work is essential to the existence because it allows us to satisfy the deepest needs for achievement, creation, and purpose. Taking part in a rewarding job has a positive impact on the general well-being. However, occupations that restrict people's capacity to use their brains, creativity, and decision-making abilities can cause a great deal of stress. Individual variables and job expectations interact to cause work-related stress, which alters a person's psychological and/or physiological state (Richardson & Rothstein, 2008). Research has shown that psychological hazards and stress at work have a negative impact on workers' health, safety, and well-being, as well as the performance of the company as a whole (Stansfeld & Candy, 2006). An association between work-related stress and physical and mental health problems has been repeatedly demonstrated by numerous studies (Choy & Wong, 2017; Desouky & Allam, 2017; Jodier, 2018; Quick & Henderson, 2016; Tripathi et al., 2018; Zare et al., 2017). The American Institute of Stress claims that one of the main causes of the larger mental health epidemic is workplace stress. People are frequently exposed to ongoing pressures at work, which can increase their vulnerability to addictive behaviors (Sinha & Jastreboff, 2013). These behaviors may serve as coping strategies but can raise long-term health risks (Conway et al., 1981; Murphy et al., 1999; Ragland et al., 2000; Schmidt et al., 2010). Examples of these behaviors include smoking, excessive caffeine use, and alcohol usage. Greater absenteeism and presenteeism rates, strained labor relations, lower employee motivation and satisfaction, less creativity, and greater turnover rates are all consequences of these problems in the workplace (Elstad & Vabo, 2008; Heo et al., 2015). When taken as a whole, these issues have a substantial influence on productivity and cost businesses money directly and indirectly, which eventually lowers their ability to compete in the market.

Working conditions for petroleum workers are difficult, especially in the Tunisian desert where the study is conducted. Workers here face isolation and harsh weather, including storms, hot summers, and cold winters (Jiang et al., 2017; Jiang et al., 2018). Working in the field while living in staff dorms causes them to be away from their families for extended periods of time, which can have a negative psychological impact and result in feelings of loneliness, anxiety, and despair (Shaygan & Yazdanpanah, 2019). Furthermore, this workforce frequently leads to unhealthy lifestyles that include smoking, excessive alcohol use, irregular eating patterns, and other harmful activities (Chen et al., 2008; Li et al., 2016).

Onshore and offshore work environments in the oil and gas sector differ greatly, which has an impact on mental and physical health in distinct ways. Compared to their offshore colleagues, onshore employees frequently feel more pressured at work and think their jobs are more repetitious (Bergh et al., 2018). Furthermore, differences in how these two groups view their jobs and health have been observed according to the type of job (Bjerkan, 2011).

To the best of knowledge, no studies have specifically addressed this issue among onshore Tunisians. This study, which intends to investigate the connection between occupational stress and addictive behaviors among workers in an onshore oil field in Tunisia, was motivated by this gap in the literature.

Material and Methods

Population and Study Design

This study was a cross-sectional analysis conducted from January 1 to June 30, 2018. Participants were employees of an onshore oil production firm in the desert of Tunisia. Employees had to have worked for at least a year and adhere to a regular schedule of two weeks on the platforms and two weeks off at home in order to be eligible. Of the 200 employees polled during their onshore rotation, 94 completed the survey, yielding a 47% response rate. The company manager was briefed on the purpose of the survey and the data collection methods prior to the start of data collection. Either conventional paper-and-pencil techniques or a secure web-based questionnaire system were used to gather data. Participants received comprehensive information regarding their rights, the purpose of the study, and the safeguards in place to protect their privacy and data. The Ethics Committee of Sfax University Faculty of Medicine granted ethical approval for this study (Approval no: 24/25, Date: 25/03/2025). Informed consent was obtained from the participants who agreed to take part in the study.

Research Instruments

Sociodemographics

The questionnaire's first portion asked questions intended to collect sociodemographic data about the study population, including marital status, educational attainment, and work-related traits.

Addictive Behaviors

Using a self-reporting technique, addictive behaviors such as smoking, drinking alcohol, and consuming tea and coffee were evaluated.

* "Do you smoke?" was the inquiry used to gauge smoking behavior. The question had three possible answers: 1 for current smokers (those who routinely smoke at least one cigarette a day and have done so for at least a year), 2 for never, and 3 for ex-smokers (those who have quit smoking for a year or more). The Fagerström test for nicotine dependence (FTND), a recognized and reliable tool for determining the degree of physical nicotine addiction, was then used to evaluate nicotine dependence in smokers (Etter et al., 1999). It includes six measures that assess cigarette usage, dependence, and urge to consume. The FTND is assessed using a range of 0 to 1 for yes/no items and 0 to 3 for multiple-choice items. A total score of 0 – 10 is obtained by adding up all of the items. The degree of the patient's physical nicotine dependence increases with the total Fagerström score. The European Psychiatric Association recently advised using

it in routine therapeutic practice (Rüther et al., 2014). The person's readiness to change and motivation to stop smoking were assessed using the Richmond exam (Richmond et al., 1993). It is a 4-item test used to assess smoking cessation motivation. The overall score is in the range of 0 to 10. Low motivation is indicated by a score of 0 – 4, moderate motivation by a score of 5 – 6, and great motivation to quit by a score of 7 – 10.

* The yes-or-no question, "Do you drink?" was used to gauge drinking habits. There were three options: 1 for current drinker (having routinely consumed alcohol at least once a week for at least a year), 2 for never, and 3 for ex-drinker (having abstained from alcohol for at least a year). The fast alcohol consumption evaluation (FACE) questionnaire, which consists of five questions, was used to analyze drinkers' alcohol intake over the course of the previous 12 months. For French general practitioners, it is a suitable screening tool and a valid questionnaire (Dewost et al., 2006). The overall score is in the range of 0 to 12. Scores below 5 for men suggest minimal or no risk, scores between 5 and 8 indicate heavy alcohol use, and scores above 8 indicate alcohol dependency.

*Intake of coffee, tea, and caffeine was determined by asking participants to indicate how much coffee and tea they typically drank during the previous 12 months. The average consumption of tea (50 mg/cup) and coffee (100 mg/cup) was used to estimate daily caffeine intake (Bracken et al., 2003).

Workplace Stress Evaluation

Karasek's job demand-control model served as the foundation for potential psychological risk factors (Karasek Jr, 1979). The self-administered Karasek questionnaire (version 26 items) is a tool used to assess the psychological and social aspects of employment. The high demand/low control/low support model of job strain development is measured using the following scales: (a) decision latitude related to the dimensional control; (b) psychological demands; and (c) social support. The main tenet of the concept is that jobs that are associated with high job demands and limited job control will experience the highest levels of stress (Karasek et al., 1998). Two conditions can be distinguished: "iso-strain," which is job strain combined with exposure to low social support at work, and "job strain," which is the mismatch between high psychological demands and limited choice freedom. Multiple-choice questions were completed by the subject, who received scores ranging from 1 (strongly disagree) to 4 (strongly agree).

Statistical Analysis

SPSS for Windows version 20.0 (IBM SPSS Corp.; Armonk, NY, USA) was used for statistical analysis. The sample's demographic and occupational features, as well as its addictive behaviors (average intake of tea and coffee, smoking, and drinking habits), were evaluated using descriptive statistics. Differences in these factors between workers with Karasek summary scores were compared using the chi-square or Fisher's exact test. The statistical association between two continuous variables (total caffeine consumption and Karasek's model scales) was assessed using Pearson's correlation. The mean scores of the Karasek model with nicotine dependence (which is classified as a binary variable, with moderate to high dependence coded as 1 and no to low dependence coded as 0) were compared using the student's *t*-test. The threshold for statistical significance was $p < .05$.

Results

Sociodemographic Characteristics of subjects

The sample consisted of 94 petroleum workers with a mean age of 41.17 (SD = 9.6) years, with a range of 27 to 63. The population was exclusively male, with an average professional seniority of 14.03 (SD = 10.6) years and a range of 1 – 38. Other sample sociodemographic characteristics are presented in Table 1.

Descriptive Analysis of Smoking, Alcohol Consumption, and Coffee/Tea Average Intake

Of 94 workers, 33 (35.1%) were current smokers, and 25 (26.6%) were ex-smokers. Almost half (48.5%) of smokers had a moderate to high nicotine dependence. According to the Richmond test, half of the population intended to quit smoking, and 25% of active smokers had a good motivation to quit. There were 18 (19.1%) current drinkers and 11 (11.7%) ex-drinkers. Coffee and tea consumption were noted in 83 (88.3%) and 71(75.5%) respectively. The average caffeine consumption was 277.22 (SD = 153.638) mg/day, ranging from 50 to 750 mg/day. More details are given in Table 2.

Occupational Stress Variables in the Petroleum Workers According to Karasek's Model

Situations of "job strain" and "iso-strain" were respectively noted in 48.9% and 27.7%. More details of this model are presented in Table 3.

Association between Occupational Stress and Addictive Behaviors

The statistical analysis indicated that current smoking was significantly associated with low social support with an OR = 2.65 (95% CI [1.034 – 6.802]). A statistically significant association was found between moderate to high nicotine dependence and job strain (OR = 5.41 (95% CI [1.19 – 24.52]). There were no statistically significant differences among other variables, which

Table 1.
Demographic Characteristics among Onshore Oil Workers

Demographic Characteristics	*n* (%)
Marital status	
Single	21 (22.3)
Married	71 (75.5)
Divorced	2 (2.1)
Widowed	0
Children	
Yes	64 (68.1)
No	9 (9.6)
Parents in charge	
Yes	41 (43.6)
No	53 (56.4)
Education level	
Primary school	11 (11.7)
High school	24 (25.5)
University	59 (62.8)
Job type	
Labor	20 (21.3)
Supervisor	42 (44.7)
Senior supervisor	32 (34)

Table 2.
Addictive Behaviors among Petroleum Workers

Addictive Behaviors	*n* (%)	Addictive Behaviors	*n* (%)
Do you smoke?		Do you drink coffee?	
Never smokers	36 (38.3)	Yes	83 (88.3)
Ex-smokers	25 (26.6)	No	11 (11.7)
Current smokers	33 (35.1)	Number of cups/day	
		1	27 (32.5)
		2	29 (34.9)
		≥3	27 (32.5)
FTND's score		Do you drink tea?	
1 – 2 = no dependence	7 (21.2)	Yes	71 (75.5)
3 – 4 = low dependence	10 (30.3)	No	23 (24.5)
5 – 6 = moderate dependence	9 (27.3)	Number of cups/day	
7 – 10 = high dependence	7 (21.2)	1	40 (56.3)
		2	15 (21.1)
		≥3	16 (22.5)
Richmond test's score		Total caffeine consumption(mg/day)	
0 – 4 = low motivation	14 (42.4)	[1 – 150]	27 (30)
5 – 6 = moderate motivation	7 (21.2)	[151 – 300]	35 (38.9)
7 – 10 = high motivation	12 (36.4)	>300	28 (31.1)
Do you drink?		FACE's scores	
Never drinkers	65 (69.1)	<5 = low or no risk	11 61.1)
Ex-drinkers	11 (11.7)	5 – 8 = excessive alcohol Consumption	4 (22.2)
Current drinkers	18 (19.1)	>8 = alcohol dependence	3 (16.7)

Table 3.
Psychosocial Risks According to Karasek's Model

Karasek's Variables	*n* (%)
High psychological demand	
Yes	60 (63.8)
No	34 (36.2)
Low decision latitude	
Yes	77 (81.9)
No	17 (18.1)
Low social support	
Yes	58 (61.7)
No	36 (38.8)
Job strain	
Yes	46 (48.9)
No	48 (51.1)
Iso-strain	
Yes	26 (27.7)
No	68 (72.3)

included alcohol consumption and coffee/tea average intake ($p > .05$) (Table 4). No significant association was observed between caffeine consumption and Karasek's scores.

Discussion

The current study looked into how Tunisian onshore workers' addictive behaviors were affected by workplace stress. The study offered empirical support for the impact of mental health on petroleum workers, despite the low response rate of 47%. Comparison of the sample's sociodemographic characteristics with those of the non-respondents revealed similarity with the general population in terms of age, sex, marital status, educational attainment, and professional seniority. Conclusions about the representativeness of the data in the sample were significantly reinforced by these findings.

The results show a robust correlation between occupational stress and nicotine dependency. The effects of stress at work on tobacco addiction have been the subject of numerous studies. According to Hassani S. et al. (Hassani et al., 2014), there was a strong correlation between the prevalence of smoking and the demand domain of occupational stress, which included job control, workload, and work pace. Furthermore, Radi et al. discovered that smoking among men was linked to increased job strain after adjusting for age, education, marital status, and antagonistic behaviors (Radi et al., 2007). This is probably caused by a variety of psychosocial hazards at work, such as inclement weather, loud noises, exposure to crude oil, excessive workloads, and shift-related sleep disturbances. In order to meet their performance targets, they frequently put in extra hours and miss out on leisure activities. There is evidence that stress can lead to smoking, and all of these factors may play a significant role in burnout (Goeders & Guerin, 1994). The study's findings showed that current smoking was significantly correlated with low social support, which is consistent with a review that examined the relationship between psychosocial stress at work and risky health behaviors. The review emphasized that smoking is a complex phenomenon that is influenced by psychosocial factors like social support and occupational stress (Siegrist & Rodel, 2006). In actuality, desert petroleum workers spend weeks at a time working in distant areas, which means they are separated from friends and family—two crucial support networks whose absence can affect well-being and create feelings of loneliness.

The results of this study show a statistically significant correlation between employees' workplace stress and moderate to high levels of

Table 4.
Association between Occupational Stress and Addictive Behaviors Presented by Odds Ratio (OR) and 95% CIs

Karasek's Variables	Current Smoking	Current Drinking	Tea Consumption	Coffee Consumption
High psychological demand	0.66 (0.27~1.58)	0.89 (0.36~2.21)	0.54 (0.19~1.54)	0.62 (0.15~2.54)
Low decision latitude	0.99 (0.33~2.97)	1.56 (0.46~5.28)	0.93 (0.27~3.22)	0.41 (0.05~3.51)
Low social support	2.65 (1.03~6.80)*	1.98 (0.76~5.14)	1.33 (0.51~3.46)	3.25 (0.88~12.06)
Job strain	0.6 (0.28~1.56)	0.96 (0.40~2.31)	0.52 (0.20~1.37)	0.50 (0.13~1.86)
Iso-strain	1.22 (0.47~3.11)	0.99 (0.37~2.64)	0.83 (0.29~2.34)	1.02 (0.24~4.19)

nicotine dependency. According to earlier studies, smoking is a common coping strategy used by people who are under stress at work. They utilize nicotine to reduce tension and anxiety related to their workplace. Research has indicated that workers in stressful jobs are more likely to smoke to cope with their stress (Son et al., 2016).

There was no correlation between drinking alcohol and stress at work. It's interesting to note that this link was not found in the majority of cross-sectional research (Siegrist & Rodel, 2006). One potential explanation is that alcohol use is forbidden during the onshore work cycle, which can persuade employees to give up alcohol. Another explanation is that significant individual differences in the propensity to increase or decrease habitual substance use in response to different stress levels may be the cause. Additionally, it is common for people to underreport their alcohol use (Boniface et al., 2014). In contrast to the present findings, a meta-analysis of 142,140 participants found that heavy drinkers are more likely than moderate drinkers to suffer stress at work (Heikkila et al., 2012).

Caffeine use and stress did not significantly correlate, according to a number of earlier studies (Conway et al., 1981; Rios et al., 2013). The results also support the conclusions of the investigation. The finding could be explained by the fact that different individuals react differently to stress. These findings demonstrate that petroleum employees face significant psychosocial hazards due to their exposure to a repetitive work environment. Employees may engage in various addictive behaviors in reaction to differing stress levels. All of the aforementioned elements have the potential to directly or indirectly endanger the productivity and well-being of employees. Therefore, in order to support health and well-being in the workplace, interventions to modify addictive behaviors must be planned and carried out. Stress management approaches may also be utilized to reduce absenteeism.

Limitations and Directions/Suggestions for Future Research

This study has a number of limitations even if it offers insightful information. First, the cross-sectional design of the study makes it difficult to determine a direct link between addictive behaviors and work-related stress. Longitudinal designs should be explored in future studies to gain a deeper understanding of these changes over time.

Furthermore, using self-administered questionnaires could lead to biases such as social desirability bias, in which individuals overreport positive traits or underreport unhealthy habits. Including objective measurements could improve the data's validity.

Although the study concentrated on alcohol, coffee, and smoking, it did not look at other possible addictive habits or health-related problems. Future studies might examine a greater variety of health-related habits and how they interact.

These limitations should be addressed in future studies by using longitudinal techniques and larger, more varied populations.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of University of Sfax (Approval no: 24/25, Date: 25/03/2025).

Informed Consent: Informed consent was obtained from the participants who agreed to take part in the study.

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