

Original Research Article

Consumption of caffeine among University students in Ajman

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ABSTRACT

Background: Researchers have become concerned with caffeine because of risks of addiction, as shown by latest studies. World Health Organization identify caffeine dependence as a clinical disorder. The objective of the study was to determine the prevalence of Caffeine Use Disorder among participants and identify determinants of Caffeine Use Disorder among participants.

Methods: Questionnaires were distributed among university students who consumed caffeinated products and were older than 18 years of age. The research was carried out in 3 universities in Ajman, UAE. The data collected was analyzed using SPSS software.

Results: It was found that the prevalence of Caffeine Use Disorder among caffeine consumers was 69%. The prevalence of Caffeine Use Disorder was significantly higher among students: who believed that their consumption had increased since joining the university ($p < 0.001$) compared to other categories. The risk of Caffeine Use Disorder was higher among participants who consumed caffeine to: feel awake (OR=1.567, 95% CI:1.05-2.34), be more productive (OR=2.06, 95% CI:1.28-3.22), and because of peer pressure (OR=2.4, 95% CI:1.03-5.62) and who believed that their caffeine consumption had increased since joining the university (OR=3.68, 95% CI:2.49-5.44).

Conclusion: The prevalence and risk of having Caffeine Use Disorder was high among university students, hence more research should be conducted and actions should be taken to reduce the prevalence of Caffeine Use Disorder.

Keywords: Ajman, Caffeine, Caffeine use disorder, UAE

INTRODUCTION

Caffeine, being one of the most consumed drug worldwide, have users ranging from age groups teens to adults. However, researchers have become concerned with it because many of the caffeine users become addicted to it, as shown by latest studies.¹ World Health Organization (WHO) and few other health professionals identifies caffeine dependence as a clinical disorder.²

Caffeine Use Disorder (CUD) is referred to a person's inability in controlling caffeine use despite knowing the adverse physical or psychological consequences associated with its continued use. The criteria used to diagnose CUD is similar to the one that DSM-IV uses as

diagnoses for Substance Abuse and Substance Dependence.³

Diagnosing CUD requires fulfillment of the 3 clinically significant indicators of distress or impairment associated with caffeine dependence: persistent desire or unsuccessful efforts to cut down or control caffeine use; continued caffeine use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by caffeine; characteristic caffeine withdrawal syndrome or caffeine use to relieve or avoid withdrawal symptoms are included in the criteria of the disorder.³ A recent concern about caffeine intake is raised as it is reported by the most recently released International Classification of Diseases

(ICD-11); Diagnostic and Statistically Manual of Mental Disorders (DSM-5) as one of the substances that can induce “Substance Dependence” in the former and “Substance Use Disorder” in the later.⁴

Studies have shown that United Arab Emirates (UAE) residents consume an average of 3.5 kg of coffee and tea beverages each year, which is nearly twice as much as in any other Gulf Cooperation Council (GCC) country. According to coffee statistics from the International Coffee Organization (ICO), about 1.4bn cups of coffee are poured per day, in the UAE.⁵

Since, university students are more prone to consume caffeinated drinks, they may be at a risk of the upcoming hazard, “Caffeine Use Disorder”, that is identified by the American Psychiatric Association DSM-5, as condition for further study.³ This was the first study done in the UAE in order to find out the prevalence of CUD among university students in Ajman. This research was conducted in order to identify the reasons and circumstances that caused students to consume caffeine, which can help the researchers in planning for future education sessions to control the consumption of caffeine among university students.⁶ This important disorder is identified by the WHO as a clinical disorder. The objective of the study was to determine the prevalence of CUD among participants and identify determinants of CUD among participants.

METHODS

The study was a cross-sectional study conducted among university students in Ajman, UAE.

Study population

The study involved university students from 3 universities (Gulf Medical University, Ajman University and City University College of Ajman) in Ajman. Inclusion criteria for the study involved students from any program available and from any year of study, students age equal to or more than 18 years, all genders, all nationalities, and who agreed to participate and sign informed consent. Owing to increased need to investigate the prevalence of Caffeine Use Disorder (CUD) among students in United Arab Emirates (UAE), the sample size was calculated as 900 including non-responses. Convenience sampling technique was utilized to recruit participants from the 3 universities. Almost equal representation of the 3 universities was present in the total sample size.

Data collection

Duration of this study was 6 months and the data was collected in a period of 3 weeks. Self-administered questionnaire was developed by the research team and validated by 3 experts (1: psychologist, 2: psychiatrist, 3: physician). The questionnaire included information about participant's sociodemographic, caffeine consumption

patterns, factors that motivate caffeine consumption. Questions related to CUD were included and approval for using these questions was obtained from the American Psychiatry Association.³

Ethical approval from IRB was mandatory requirement for research, informed consent was obtained from participants before enrolling them into the study, respondents were informed about their rights to participate in the study or not and about the objectives of the study. The study was anonymous, confidentiality of the information was respected and only the research team and member of IRB had access to the data. After getting approval from IRB, official approval from the site was obtained. Eligible participants were approached at the site of data collection. Those who accepted to participate and signed informed consent were handed questionnaire to be filled.

Data analysis

SPSS version 24 was used to analyze the data. The data was presented as binary logistic regression, tables, figures and text format and analytic statistics (chi-square) to assess the association between caffeine consumption and selected variables.

RESULTS

The present study included 900 participants. Most of the participants were under 20 years of age (61.7%), and female (61.4%). Based on program, 50% of the participants were Medical and 50% were Non-medical. Based on the year of study, most of the participants were in 1st Year (36.2%), followed by 3rd Year (29.0%). The least number of participants were from 4th Year or above (7.1%).

Caffeine use disorder (CUD)

It was found that prevalence of CUD among students who consumed caffeine (n=900) was 69% and only (n=279) did not have CUD 31%. Figure 1. shows distribution of participants based on CUD. 272 participants (30.2%) having severe CUD, whereas 158 participants (17.6%) having moderate CUD.

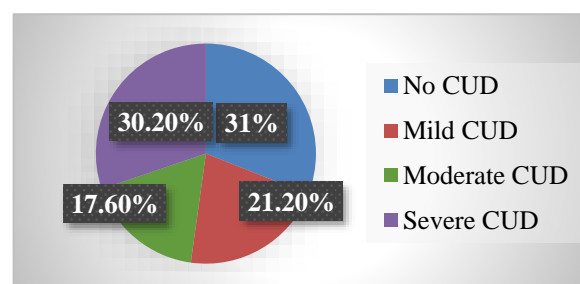


Figure 1: Distribution of participants based on cud categories.

Figure 1 shows distribution of participants based on CUD. 279 participants (31.0%) had no CUD, followed by 272 participants (30.2%) having severe CUD and 191 participants (21.2%) having mild CUD, whereas 158 participants (17.6%) having moderate CUD.

Association of different factors and caffeine use disorder (CUD)

Table 1 shows the association between CUD and personal influencing / academically demanding factors triggering caffeine consumption variables. The highest proportion of

CUD and statistically significant associations with regard to consumption of caffeine: in order to feel awake (75.5%) ($p<0.001$); to help with focus and concentration (82.2%) ($p<0.001$); to be more productive (87.2%) ($p<0.001$); to improve physical performance (81.9%) ($p<0.001$); from different sources affecting differently (84.8%) ($p<0.001$); improved test scores (86.4%) ($p<0.001$); quantity of caffeine exceeding normal limits (87.6%) ($p<0.001$).

Table 1: The association between caffeine use disorder (CUD) and personal influencing / academically demanding factors triggering caffeine consumption.

Variable	Subcategory	Caffeine Use Disorder				P value
		No		Yes		
		Number	%	Number	%	
Feel awake	Yes	142	24.5	437	75.5	<0.001
	No	137	42.7	184	57.3	
Taste / aroma	Yes	147	30.3	338	69.7	0.628
	No	132	31.8	283	68.2	
Help with focus and concentration	Yes	74	17.8	341	82.2	<0.001
	No	205	42.3	280	57.7	
More productive	Yes	37	12.8	253	87.2	<0.001
	No	242	39.7	368	60.3	
No specific purpose	Yes	88	32.5	183	67.5	0.531
	No	191	30.4	438	69.6	
Improve physical performance	Yes	25	18.1	113	81.9	<0.001
	No	254	33.3	508	66.7	
Like caffeinated drinks with additives	Yes	126	28.8	312	71.2	0.158
	No	153	33.1	309	66.9	
Different sources of caffeine affect differently	Yes	57	15.2	317	84.8	<0.001
	No	222	42.2	304	57.8	
Score better after consumption	Yes	47	13.6	299	86.4	<0.001
	No	232	41.9	322	58.1	
Quantity of caffeine exceeds	Yes	52	12.4	368	87.6	<0.001

Table 2: The association between caffeine use disorder (CUD) and the social factors triggering caffeine consumption.

Variable	Subcategory	Caffeine use disorder				P value
		No		Yes		
		Number	%	Number	%	
Social gatherings	Yes	81	26.3	227	73.7	<0.05
	No	198	33.4	394	66.6	
Peer pressure	Yes	10	11.9	74	88.1	<0.001
	No	269	33.0	547	67.0	
Increase in caffeine consumption	Yes	131	20.7	502	79.3	<0.001
	No	148	55.4	119	44.6	
Parents or siblings consume caffeine	Yes	211	29.8	498	70.2	0.121
	No	68	35.6	123	64.4	

Table 3: Logistic regression analysis for personal influencing / academically demanding and social influencing factor variables.

Variable	Subcategory	No.	COR	CI	P value	AOR	CI	P value
Feel awake	Yes	579	1					
	No	321	2.291	1.713 – 3.066	<0.001	1.567	1.051 – 2.336	0.028
Help with focus and concentration	Yes	415	1					
	No	485	3.374	2.476 – 4.596	<0.001	1.234	0.815 – 1.870	0.321
More productive	Yes	290	4.497	3.071 – 6.583	<0.001	2.062	1.276 – 3.217	0.003
	No	610	1					
Improve physical performance	Yes	138	2.260	1.429 – 3.575	<0.001	1.396	0.777 – 2.509	0.264
	No	762	1					
Score better after consumption	Yes	346	4.584	3.227 – 6.510	<0.001	2.629	1.695 – 4.079	<0.001
	No	554	1					
Social gatherings	Yes	308	1.408	1.037 – 1.912	0.028	0.854	0.573 – 1.273	0.439
	No	592	1					
Peer pressure	Yes	84	3.639	1.851 – 7.157	<0.001	2.4	1.025 – 5.617	0.044
	No	816	1					
Increase in caffeine consumption	Yes	633	1					
	No	267	4.766	3.501 – 6.489	<0.001	3.683	2.492 – 5.442	<0.001

Table 2 shows the association between CUD and social factors triggering caffeine consumption variables. The highest proportion of CUD and statistically significant associations with regard to consumption of caffeine were seen: in social gatherings (73.7%) ($p=0.028$); under peer pressure (88.1%) ($p<0.001$) and after joining university (79.3%) ($p<0.001$).

Logistic regression

Table 3. shows logistic regression analysis for socio-demographic, personal influencing / academically demanding and social influencing factor variables. The logistic analysis showed that the risk of CUD is significantly higher with the following factors: who had consumed caffeine to feel awake, help with focus and concentration, feel more productive, to improve physical performance, score better, social gatherings, peer pressure, and reported increase in caffeine consumption after joining university. The adjusted OR is statistically significant for the following factors: took caffeine to feel awake, feel more productive, to score better, peer pressure and reported an increase in consumption after joining university. For those who did not consume caffeine to feel awake, the chance is 1.56 times higher. For those who consume caffeine to be more productive, the chance is 2.06 times higher. For those who consume caffeine because they score better after consumption, the

chance is 2.62 times higher. For those who consume caffeine under peer pressure, the chance is 2.40 times higher. For those whose caffeine consumption increased after joining university, the chance is 3.68 times higher.

DISCUSSION

Caffeine Use Disorder (CUD) is referred to a person's inability in controlling usage of caffeine despite knowing the adverse physical or psychological consequences associated with its continued use. It is included in the conditions for further study section of the Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM-5).⁷ The criteria used to diagnose CUD in DSM-5 is similar to the one that DSM-IV uses as diagnosis for Substance Abuse and Substance Dependence.^{2,3}

In this study, the prevalence of CUD among caffeine consumers was 69% of which 21.2%, 17.6% and 30.2% of the participants had mild, moderate and severe CUD type respectively. Similar findings were seen in another study, where 3% of the participants had mild CUD, 39% had moderate CUD and 57% had severe CUD.⁸

This study found that the prevalence of CUD was higher among students who consumed caffeine to feel awake, for taste/aroma, to help with concentration, and to be more

productive, and students who believed that their consumption had increased since joining the university.

Majority of the participants with highest proportion of CUD consumed caffeine to feel awake (75.5%), to help with focus and concentration (82.2%); to be more productive (87.2%). Similar results were seen in a cross-sectional study where caffeine was used as one of the wake-promoting drug. They found that wake-promoting drug use, high caffeine in coffee and smoking allowed to be awake and were associated with increased odds of a fatigue-related error, stress and burnout and that caffeine consumption by participants was more common than smoking.⁹ A research found that: three alertness items (concentration, keep awake, wake up) were significant predictors of caffeine consumption among the students.¹⁰

High proportion of CUD was also seen in students who believed that their consumption had increased since joining the university (79.3%). A study conducted on medical students concludes that there is a significant stress impact on caffeine consumption, and thus affecting general health of the average medical student which supports our findings of increased consumption of caffeine in students.¹¹

In another study conducted in North Jordan found that reasons for caffeine consumption were to stay awake for more hours during exams, as daily routine, to increase concentration, to control stress, or as part of norms or traditions. As a predictor, coffee consumption was significantly associated with "consumption during exams", "a daily routine", "to increase concentration", and "to control stress". Frequency distribution of demographic information and reasons of consumption were significant in response to "increase caffeine consumption during exams". It was concluded that the high percentage of caffeine consumption on a daily basis and during exams among medical students mandates serious efforts to distribute awareness on benefits, side-effects and withdrawal symptoms.¹²

CONCLUSION

The prevalence of Caffeine Use Disorder (CUD) among caffeine consumers was 69% of which 21.2%, 17.6% and 30.2% of the participants had mild, moderate and severe CUD type respectively. The prevalence of CUD was significantly higher among students who believed that their consumption had increased since joining the university compared to other categories. Factors that encouraged consumption of caffeinated products were: to feel awake, to help with concentration, and to be more productive. The risk of CUD was significantly higher among participants who were taking caffeine to feel awake, to be more productive, because of peer pressure, believed that their caffeine consumption had increased since joining the University.

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REFERENCES

1. Meredith SE, Juliano LM, Hughes JR, Griffiths RR. Caffeine Use Disorder: A Comprehensive Review and Research Agenda. *J Caffeine Res*. 2013;3(3):114-30.
2. Geneva: World Health Organization. The ICD-11 International statistical classification of diseases and related health problem, 2018. Available from <https://icd.who.int/browse11/l-m/en>.
3. Jibson MD, Seyfried LS. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, DC: American Psychiatric Association; 2013.
4. Basu D, Ghosh A. Substance use and other addictive disorders in international classification of Diseases-11, and their relationship with diagnostic and statistical Manual-5 and international classification of Diseases-10. *Indian J Soc Psychiatr*. 2018;34(1):54-62.
5. ArabianBusiness.com. UAE gulps twice as much coffee as other GCC states, 2019. Available from: <https://www.arabianbusiness.com/uae-gulps-twice-as-much-coffee-as-other-gcc-states-465928.html>.
6. Devi SLS, Abilash SC, Basalingappa S. The Rationale of Caffeine Consumption and its Symptoms During Preparatory and Non-Preparatory Days: A Study Among Medical Students. *Biomed Pharmacol J*. 2018;11(2):1153-60.
7. Budney AJ, Lee DC, Juliano LM. Evaluating the Validity of Caffeine Use Disorder. *Current Psychiatry Reports*. 2015;17(09):1-6.
8. Striley CLW, Griffiths RR, Cottler LB. Evaluating dependence criteria for caffeine. *J Caffeine Res*. 2011;1:219-25.
9. Ogeil RP, Barger LK, Lockley SW, O'Brien CS, Sullivan JP, Qadri S, et al. Cross-sectional analysis

of sleep-promoting and wake-promoting drug use on health, fatigue-related error, and near-crashes in police officers. *BMJ Open*. British Medical Journal Publishing Group. 2018.

10. Mcilvain GE, Noland MP, Bickel R. Caffeine Consumption Patterns and Beliefs of College Freshmen. *American J Health Education*. 2011;42(4):235-44.
11. Šabić L, Mušanović A. Smoking and Caffeine Consumption as Stress Coping Mechanisms in Medical Students. *IFMBE Proceedings CMBEBIH* 2019;681-6.

12. Saadeh R. Caffeinated Beverages Consumption Habits and Use among Medical Students in North Jordan. *Jordan Medic J*. 2019;53(1):1-6.

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