

Original article

Caffeine Consumption: Habits and knowledge of Public Health students at Benghazi University

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Abstract

Caffeine consumption is a habit of many university students worldwide due to its wide availability and stimulatory effects; however, due to its side effects, it has become a global public health concern nowadays. Many previous research studies have revealed that college students have high caffeine consumption without adequate knowledge of its benefits, side effects, and withdrawal. This study aims to assess the caffeine consumption habits of public health students and their knowledge concerning its benefits, side effects, and withdrawal symptoms. A descriptive cross-sectional study was conducted at the public Health Faculty between February and March 2024. A total of 325 students aged 18 - 26 years, from first to final year, who agreed to participate and complete the questionnaire, were recruited from the Faculty of Public Health. Data were collected by means of a self-administered questionnaire and analyzed using SPSS version 20. The sample was composed of 92% females and 8% males; most of them (56.92%) aged 21-23 years. Most participants (39.08%) were from the fourth year, and the majority (91.08%) were caffeine consumers. Most students started their caffeine consumption at 13-17 years. Coffee was the most preferred caffeinated drink (55.80%); about half of the participants (50.15%) consume caffeine 2-3 times a day, commonly in the morning (59.38%). The most common reason for caffeine consumption was for academic purposes (55.13%). The majority of students know caffeine (87.69%), and about (68.61%) had awareness about products that contain caffeine. However, more than half of students (57.84%) don't know the safe daily limit of caffeine. Most of the students had little knowledge about the benefits (80.31%), side effects (71.39%), and withdrawal symptoms (69.85%). The results highlight a high prevalence of caffeine consumption among public health students with little or inadequate knowledge about caffeine and suggest the need for awareness programs to educate the students about the wise consumption of caffeine, its side effects, and the healthier alternatives.

Keywords: Caffeine consumption, Habits, Knowledge, College students.

Introduction

Caffeine is a natural chemical compound and a member of the methylxanthine group; it has a stimulant effect on the central nervous system [1]. Worldwide, caffeine is the most commonly consumed and legally accepted psychoactive substance found in different dietary sources such as tea, coffee, drinks, cocoa beans, and cola nuts [2]. Due to caffeine's stimulant effect along with its availability in a vast range of foods, there is a high prevalence (around 80%) of caffeine consumption around the world [3]. According to Health Canada, a caffeine dose up to 400mg/day is acceptable and has no harmful health effects [4]. Studies have shown that moderate daily caffeine consumption positively affects physical and mental health. Caffeine intake at a modest level may boost vigilance, diminish fatigue, and reduce the risk of some illnesses [5]. Conversely, caffeine consumption at high doses has numerous negative effects on health, such as sleep disturbance, hypertension, arrhythmia, nervousness, and gastric upset [6], as well as appetite suppression, mood disturbance, sleep disruption, and anxiety [5]. A local study has reported negative impacts of caffeine among the general population in Benghazi city, such as insomnia, nervousness, and headache [7].

According to the literature, students reported that their caffeine intake has increased since they entered college due to increased study burden [8], particularly during exam times [9]. Many studies have shown that the main reasons behind increased caffeine consumption by university students were to enhance cognition [3] and to stay awake, especially during exam days [10, 11]. In Libya, caffeine consumption among medical students at Benghazi University was increased mainly during exam seasons [12].

Besides, researchers had also revealed that students were consuming caffeine without awareness of its benefits, problems, and withdrawal symptoms [13-16].

Caffeine intake habits and knowledge of public health students are concerning due to their great role in the community as health counselors. In Libya, there is limited data available on caffeine consumption habits and knowledge of this important demographic group, and little consideration has been given to students' awareness of products that contain caffeine, the safe limits of caffeine, and knowledge of its health benefits, side effects, and withdrawal symptoms. This study aims to provide more specific insights into caffeine consumption habits of public health students and their knowledge concerning its benefits, side effects, and withdrawal symptoms.

Methods

Study design and setting

This descriptive cross-sectional study was carried out at the Public Health Faculty, University of Benghazi, Benghazi, Libya.

Study population

A total of 325 students aged 18 - 26 years from the first year to the final year were recruited conveniently from the faculty of Public Health. Every student who accepted to participate and complete the questionnaire was accepted.

Approval to collect the data was obtained from the Nutrition Department at the University of Benghazi. The Research Ethics Committee at the Faculty of Public Health, University of Benghazi, approved the study. After an introductory presentation informing students about the rationale and implementation of the study, consent was taken from all the participants prior to their participation. All questionnaires were anonymous and unidentified to ensure the secrecy of the collected information.

Study period

Data collection was conducted between February 1 and March 30, 2024.

Sample size

Sample size was calculated using Solvins formula (16). The margin of error was considered 5%, and 95% was the confidence interval.

Data collection

Data were collected by means of a questionnaire (available in English and Arabic languages) designed by the researchers based on a thorough review of the literature [9, 10]. The questionnaire consists of three sections:

- The first section covers the basic demographic characteristics of participants such as age, academic grade, and gender.
- The second section includes questions to explore the caffeine consumption habits, such as consumption of caffeinated beverages, favorite form of caffeine, number of times, and the time of day of caffeine consumption, and reasons for caffeine consumption.
- The third section comprised statements intended to define students' knowledge about some of the benefits, side effects, and withdrawal symptoms of caffeine. Five correct options and five incorrect options were included in each question, identified from the literature. [14] One mark was awarded for a correct answer, one mark was deducted for an incorrect answer, and no marks were awarded or deducted for not answering. The participants' scores were calculated and categorized as (0 = without knowledge; 1 = little knowledge; 2-3 = moderate knowledge; and 4-5 = good knowledge).

Statistical analysis

Descriptive statistics were used, and data were presented in the form of frequencies and percentages in tables and figures. A p- value of less than 0.05 was considered statistically significant. Data was entered and analyzed using the Statistical Package for the Social Sciences (SPSS) software version 20.

Results

Demographic characteristics

Table 1 indicates the demographic characteristics of students; the majority of participants (92%) were females, while males represented only (8%). The most predominant age group was aged 21-23 years old (56.92%). According to their academic year, fourth-year students were the most participating students (39.08%). The majority of participating students were non- smokers (96.62%).

Caffeine consumption habits

Table 2 presents caffeine consumption habits; a high proportion of surveyed students (91.08%) were caffeine consumers. Most students started to consume caffeine at 13-17 years old (53.90%). The most preferred caffeinated drink was coffee (55.80%), followed by cappuccino (17.10%) and tea (14.20%). About half of the participants (50.15%) consume caffeine 2-3 times a day. Most of the participants consume caffeine in the morning (59.38%) followed by evening (21.23%).

Table 1: Demographic characteristics

Characteristic	Number (%)
Gender	
Females	299 (92)
Males	26 (8)
Age (years)	
18-20	17 (5.23)
21-23	185 (56.92)
24-26	123 (37.84)
Academic year	
First	45 (13.85)
Second	72 (22.15)
Third	80 (24.62)
Fourth	128 (39.38)
Smoking status	
Smokers	10 (3.07)
Non smokers	315 (96.92)

The common reasons for caffeine consumption among students are illustrated in Figure 1. The majority of students (55.13%) consume caffeine for academic reasons, followed by those who consume caffeine for social reasons (23.11%), whereas (10%) consume caffeine for its taste, and (7.30%) to get alertness, while (4.50%) of students consume caffeine to increase their sports performance.

Table 2: Caffeine consumption habits

Variable	Number (%)
Caffeine consumers	
Yes	296 (91.08)
No	29 (8.92)
Starting age of caffeine consumption	
Less than 8 years	15 (4.61)
8-12 years	14 (4.30)
13-17 years	175 (53.84)
18->20 years	119 (36.61)
The most preferred form	
Coffee	181 (55.69)
Tea	44 (13.53)
Soft drinks	25 (7.69)
Cappuccino	55 (16.92)
Chocolate	10 (3.07)
Cocoa	4 (1.23)
other	6 (1.84)
Frequency of regular caffeine intake	
1time/ day	91 (28)
2-3 times/ day	163 (50.15)
4-5 times/ day	21 (6.46)
>5 times/ day	50 (15.38)
Day time for caffeine consumption	
Morning	193 (59.38)
Afternoon	40 (12.30)
Evening	69 (21.23)
Late Night	23 (7.07)

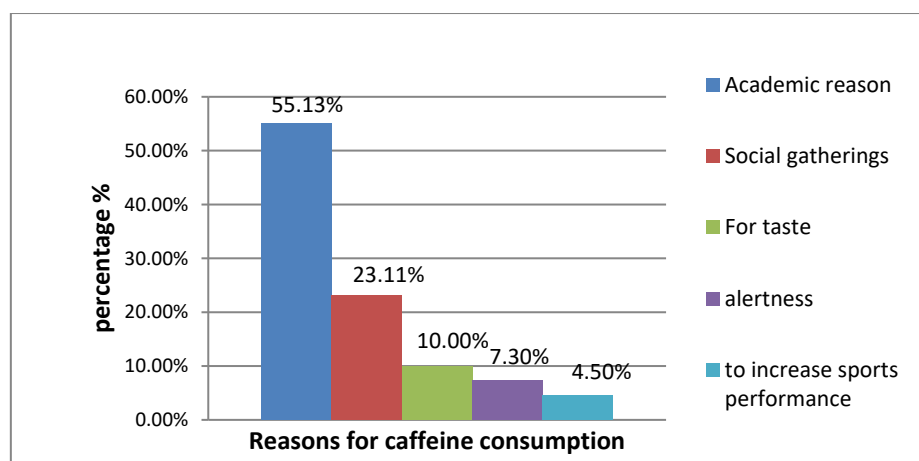


Figure 1: Reasons for caffeine consumption

Knowledge of students about caffeine

As shown in Table 3, the majority of students know caffeine (87.69%), while (12.31%) did not know it. As well, most of the students have awareness about products that contain caffeine (68.61%), while (31.38%) of them did not know if they consume products that contain caffeine or not. In addition, only (30.46%) of students know the daily safe amount of caffeine, which is (200-400mg), while more than half of them (57.84%) don't know the safe daily limit of caffeine.

Table 3: Knowledge of students about caffeine

Whether students know caffeine or not	
Know	285 (87.69)
Don't know	40 (12.31)
Awareness of products that contain caffeine	
Yes	223 (68.61)
No	102 (31.38)
Knowledge about the safe daily amount of caffeine	
200-400mg	99 (30.46)
600-800mg	32 (9.85)
1000-1500mg	6 (1.85)
Don't know	188 (57.84)

Knowledge about the benefits, side effects and withdrawal symptoms of caffeine

Figure 2 indicates the distribution of students according to their knowledge level about caffeine, regarding the benefits of caffeine, while (15.38%) of students had no knowledge, about (80.31%) of them had little knowledge, whereas (4.31%) of students had moderate knowledge and none of them had good knowledge about the benefits of caffeine. Concerning the side effects of caffeine, while (24.31%) had no knowledge, (71.39%) of students had little knowledge, but (4.31%) of them had moderate knowledge and none of them had good knowledge. In terms of caffeine withdrawal symptoms, while (8%) had no knowledge, around (69.85%) of students had little knowledge, and (16.92%) of them had moderate knowledge, whereas (5.23%) of them had good knowledge about the withdrawal symptoms.

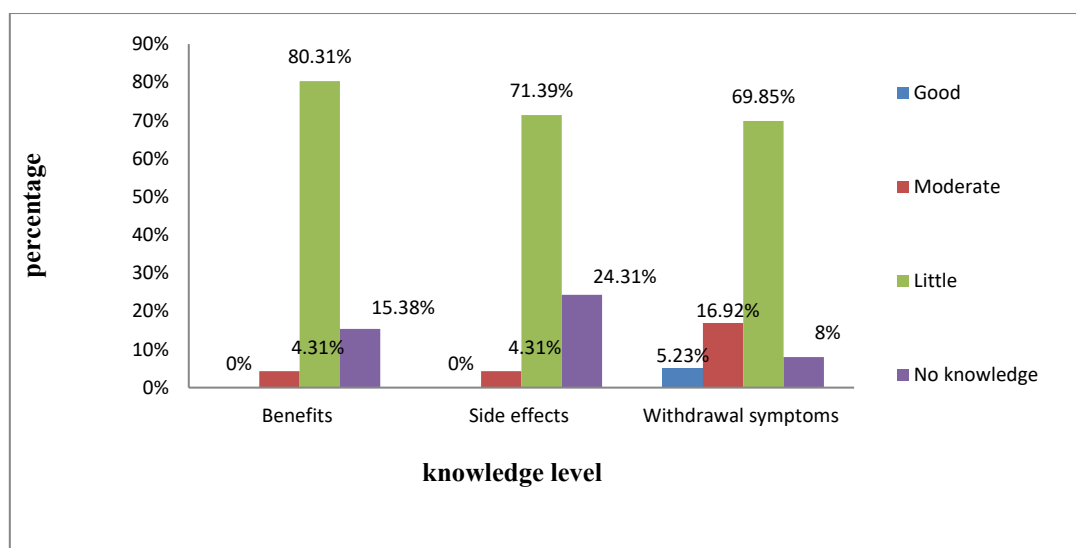


Figure 2: knowledge about the benefits, side effects, and withdrawals of caffeine

Discussion

The current study aimed to determine the habits of caffeine consumption and the knowledge of its effects among public health students. The majority of participants (92%) were females and the most predominant age group was 21-23 years old (56.92%). Fourth year students were the most participating students (39.08%), and the majority of participating students were non-smokers (96.62%).

Among 325 surveyed participants, (91.08%) were caffeine consumers. This high percentage reflects the global trend of caffeine consumption among university students, and these findings are in line with the findings of an Iraqi study in which (85.7%) of college students reported consuming different types of caffeinated products [9]. Similarly, (99.1%) and (92%) of university students in New Zealand [17], and in the United States [18], were found to use caffeine, respectively. High prevalence of caffeine intake was also demonstrated among college students in Pakistan [20]. In the present study, the majority of students (53.84%) started their caffeine consumption as early as they were (13-17) years. This observation was similar to a previous study carried out in the United Arab Emirates (UAE) in which the majority of students started their caffeine consumption when they were less than 16 years [2]. In contrast, (34.5%) of Lahore University students started at (16-20) years [21], and in India, most of the students started at 18-20 years [20]. Besides, the total years of caffeine consumption were 11-16 years among most of the students (82.7%) from Islamabad [22]. In this study, coffee was the most preferred type of caffeinated products (55.68%), followed by cappuccino (16.92%). This result aligns with previous studies in Saudi Arabia [10,19], (UAE) [2], Dubai [4], the United States [18], and Malaysia [13]. On the other hand, tea was the most consumed caffeinated product in other countries like Iraq [9] and Pakistan [23].

Most of the students in the present study consumed caffeine regularly for 2-3 times per day (50.15%). Similarly, an Iraqi study at the University of Fallujah has reported that 40% of surveyed students drank caffeine 2-3 times a day [8]. Likewise, the frequency of caffeine consumption among students from the UAE was 2-3 times a day [24] and equally among (72%) of college students from Lahore [25]. The same findings were also reported in Alexandria University [26]. On the contrary, most of the students (69%) at Al-Mustansiriyah University, from Iraq found to consume caffeine 1-2 times a day [9]. Lower consumption frequency was also reported among Malaysian students [11, 13].

In the current study, morning was the preferred time of caffeine consumption by most of the students (59.38%); this result is in agreement with previous studies carried out in Iraq [9] and UAE [24]. Conversely, most of students from India prefer to consume caffeine in the evening [27]. In addition, the most common reason for caffeine consumption reported in this study was for academic purposes (55.13%). This finding is comparable with previous studies carried out in UAE [24], South Africa [14] and Iraq [9]; other reasons were reported in studies from different countries such as to feel awake in USA [18], for pleasure at Florida State University [29], for taste in India [28], and when students did not get enough sleep was reported in two studies from USA [30, 31]. These differences in caffeine consumption habits due to cultural differences. The majority of students in this study (87.69%) knew caffeine, and most of them (68.61%) were aware of products that contain caffeine as an ingredient. These findings were comparable with an earlier study in the UAE [2]. On the other hand, a study conducted on students from Saudi Arabia reported that most of the students had no knowledge on ingredients of caffeinated products [32]. Regarding the awareness of students about the daily safe amount of caffeine, more than half of the surveyed students had no knowledge about the daily safe amount of caffeine. This result is arranged in a line with a study carried out in the UAE [2].

Regarding students' knowledge of the benefits, side effects, and withdrawals of caffeine, the current results revealed that most students showed little knowledge of the benefits (80.31%), side effects (71.39%), and withdrawals of caffeine (69.85%). These observations were consistent with previous studies conducted in Malaysia [13], South Africa [14], the USA [15], and Islamabad [22]. Different results were observed in other studies, for instance, in Pakistan, 46% of medical students and 25% of non-medical students were categorized as having high knowledge of caffeine [8]. Another study in Iraq has revealed that students had insufficient knowledge about the benefits of caffeine. This was in line with the present study; however, they showed better knowledge concerning caffeine side effects and withdrawal symptoms [9]. Moreover, the majority of students from the University of Lahore had knowledge about the benefits of caffeine; they also had some knowledge of side effects and withdrawal symptoms [21]. These variations may be due to differences in the awareness levels between communities and the demographic characteristics. The findings of this study may benefit the students through change their lifestyle and creating a healthier academic environment. Future research should measure the actual consumed amount of caffeine in all faculties of the university, as well as longitudinal studies to investigate the causal relationship between caffeine intake and academic performance.

Conclusion

This study revealed a high prevalence of caffeine consumption among public health students at the University of Benghazi. The most common reason for caffeine consumption was for academic purposes. Coffee was the most preferred choice of caffeinated products. They prefer to consume caffeinated products 2-3 times a day, preferably in the morning. They were chronic caffeine consumers when they were 13-17 years. Although most students were aware of caffeine and caffeine-containing products, they did not know its safest daily limit, nor did they have much knowledge of its benefits, side effects, and withdrawal symptoms. Educational programs should increase the awareness of students about the wise consumption of caffeine, its side effects, and withdrawal symptoms, and about the alternative stress control approaches (time control, physical activity, good sleeping, etc.), besides the caffeine content should be mentioned on the labels of different products by food authorities.

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Conflicts of Interest

The authors declare no conflict of interest.

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