



The Impact of Arabic Coffee Consumption on Academic Performance in Saudi Arabia

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Abstract

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Coffee is a globally consumed beverage that has undergone extensive research exploring its effects on human health and performance. Specifically concerning higher education students, the influence of coffee consumption on academic performance has garnered interest. Various research papers argued that intake of moderate coffee can positively improve student academic performance by improving awareness and cognitive ability. However, extreme coffee consumption can lead to adverse results for students' academic performance, including anxiety disorders, limited attention ability, and bad sleep quality. In the Kingdom of Saudi Arabia (KSA), Arabic coffee consumption spread beyond cultural and social practices; it is a common habit among university students. The culture of intake coffee is deeply rooted in students' daily lifestyle. For numerous students, this usual beverage delivers relief and a break from the academic stress they might face. It acts as a tool for university students to shape bonds with university peers and undertake useful conversations. The practice of making and sharing cups of Arabic coffee signifies relationships and plays a key role in university student life. While the Arabic coffee consumption is greatly embedded in Saudi Arabian culture, its probable influence on the academic performance of university students prevails an area of debate. The current study aims to fill this gap by investigating the impact of motives (i.e. cognitive enhancement, negative affect relief, reinforcing effect, weight control) to consume Arabic coffee on academic performance of university students.

1. Introduction

Arabic coffee, originated from *Coffea Arabica* (Rubiaceae plant), considered as a crucial part of Saudi Arabian habits and is outstandingly the most intake hot beverage in the nation (Al-Mssallem & Brown, 2013). Mainly prepared from beans of Arabic coffee, the widespread selections in Saudi Arabia comes from Jizan city or from outside KSA from Yemen, and Ethiopia (Al-Abdulkader et al., 2018; Butt & Sultan, 2011). Global coffee expenditure risen by 4.2% to reach 175.6 million bags of coffee for year 2021/2022, indicating a remarkable increase if compared to the 0.6% increase noted in the preceding year (International coffee organization,

n.d.). The release of accumulated pent-up demand, a consequence of the COVID-19 years, combined with robust global economic growth of 6.0% in 2021, serves as the key explanation for the significant rebound in coffee consumption during the coffee year 2021/22 (International coffee organization, n.d.) . In 2021, the market share of the coffee industry in Saudi Arabia reached US\$ 1,575.52 million and is anticipated to reach US\$ 2,220.70 million by 2028, with an estimated compound annual growth rate (CAGR) of 5.1% from 2021 to 2028 (businessmarketinsights, 2024). On average, a typical Saudi adult partakes in Arabic coffee consumption, ranging from 60 to 300 mL in a single session, accumulating an annual equivalent of 1.6 kg of coffee (Butt & Sultan, 2011). In comparison to popular coffee varieties such as Nescafe® and Turkish coffee, Arabian coffee contains significantly lower caffeine content. Despite the perception among the Saudi population that they are substantial coffee consumers, their caffeine intake remains relatively low. Notably, a standard Arabian coffee cup (25 mL) contains merely 4.0 mg of caffeine. In contrast, normal prepared instant coffee and Turkish coffee have 42 mg and 80 mg per cup, respectively. This implies that an individual consuming one cup of Turkish coffee ingests caffeine at a rate 20 times higher than someone drinking an equivalent volume of Arabian coffee. Furthermore, caffeine content in Turkish coffee equals twice that of one cup of instant coffee (Rezk et al., 2018). It's important to highlight that Ingesting caffeine up to 400 mg per day is deemed safe.(Commissioner, 2023).

The Saudi market offers different types of Arabic coffee, distinguished by roasting degrees that vary from light to dark (Al-Qarni et al., 2021). The roasting process, influenced by time and temperature, plays a crucial role in determining the coffee's color. Although Arabic coffee is rich in antioxidants like phenolic and flavonoid compounds (Ahmed et al., 2013), the roasting process significantly alters its biological activity and chemical composition, where the caffeine content decrease with an increase in the roasting degree (Al-Qarni et al., 2021; Cho et al., 2014). Coffee from light roasting exhibits higher antioxidant capacity due to its polyphenol content compared to hard-roasted coffee (Vignoli et al., 2014).

In recent decades, coffee has transitioned from a mere commodity to a specialized product, a shift often categorized into the distinct "three waves of coffee consumption" (Manzo, 2014). The initial wave, commencing in the 1960s, marked the onset of mass-market coffee consumption, characterized by substantial growth and widespread availability. The second phase of coffee consumption emerged in the 1990s, spurred by the establishment of coffeehouse chains, notably exemplified by Starbucks. These coffeehouses introduced specialty coffee to cater to the evolving consumer demand for heightened coffee quality. Consequently, coffee underwent a transformation, shifting from a commodity to a luxury product (Carvalho et al., 2015). The inception of the third wave of coffee occurred through the efforts of small roasters, emphasizing distinct regions and pioneering new brewing techniques. It is crucial to explore the immediate and prolonged impacts of both positive and negative aspects of caffeine consumption on physical and mental well-being (including better academic performance). Notably, caffeine exhibits a recognized stimulant effect, as evidenced by studies such as Barry et al. (Barry et al., 2008), contributing to heightened alertness and faster reaction times upon consumption (Souissi et al., 2008). The peak concentration of caffeine in the body occurs approximately 45 to 60 minutes after ingestion, as indicated by Krieger et al. (Krieger et al., 2016). Numerous studies have indicated that coffee can have neutral or mildly advantageous effects on health. There is substantial evidence supporting the positive health impact of moderate coffee consumption in reducing the risk of various chronic diseases. However, it is important to note that excessive intake is likely to be detrimental, as suggested by studies such as Poole et al. (Poole et al., 2017).

In the Saudi Arabian context, Arabic coffee represents a form of unfiltered boiled coffee that appears to contain constituents with potential notable health effects, as discussed by Butt and Sultan (Butt & Sultan, 2011). This coffee variety holds a significant cultural presence as it is a customary beverage offered to guests, regularly consumed in Saudi households, and a customary choice at social events and gatherings. Typically served in traditional small cups, Arabic coffee is often accompanied by fresh or preserved dates, contributing to its cultural significance (Khan et al., 2017). Arabic coffee is a blend of lightly roasted green coffee beans infused with cardamom. The potential health effects of regular coffee consumption have become a subject of growing scientific interest. The antioxidants present in coffee play a helpful role in lowering the risk of coronary heart disease (Gebeyehu et al., 2020). Numerous studies have indicated a positive correlation between elevated consumption of coffee beverages, and health consequences. Consequently, the present study was crafted to explore the impact of Arabian coffee (Saudi coffee) intake on the academic performance of higher education students.

In the recent years, researchers have shown growing interest in exploring the connection between lifestyle choices and academic performance (Bessey, 2022; He et al., 2004; Lind & Cendan, 2003; Lockhart, 2017; Rampersaud et al., 2005). One aspect of daily life that has garnered limited attention in academic literature is the intake of traditional beverages and its potential influence on cognitive functions (Hindmarch et al., 1998; Wong et al., 2014; Yan et al., 2022). This paper investigates consuming Arabic coffee (as a distinctive cultural setting of Saudi Arabia) and examining its potential impact on the academic performance of students. Arabic coffee, often referred to as "Gahwa" or "Qahwa," occupies a significant position in Saudi Arabian culture (AL-Asmari et al., 2020). Presented in small cups, this age-old beverage is deeply woven into social occasions, professional discussions, and day-to-day routines. Crafted from lightly roasted coffee beans blended with cardamom, it produces a unique flavor that enralls the senses. (AL-Asmari et al., 2020; Maspul, 2021). While Arabic coffee has demonstrated positive health effects, such as enhancing memory, mood, and cognitive performance (ALAsmari et al., 2020; Alfawaz et al., 2020; Borota et al., 2014; Gebeyehu et al., 2020), studies indicate that it may both decrease the risk of liver cancer and increase the risk of heart disease, depending on factors like cholesterol levels (AlQuaiz et al., 2014; Badkook & Shrourou, 2013; Bravi et al., 2013).

While consuming Arabic coffee is a traditional habit in Saudi Arabia, its potential effects on cognitive performance and academic achievement remain an intriguing area for investigation. Studies in the realm of nutritional neuroscience have brought attention to how specific dietary selections can influence cognitive functions, memory, and alertness (Lieberman et al., 2005; Poulouse et al., 2017; Zamroziewicz & Barbey, 2016). Coffee, being a universally consumed beverage, has been the focus of various investigations into its cognitive advantages, primarily linked to caffeine, a natural stimulant present in coffee beans (Johnson-Kozlow et al., 2002; Kim et al., 2021; Paz-Graniel et al., 2021; Zhou et al., 2018). Nonetheless, the distinctive attributes of Arabic coffee, encompassing its preparation and cultural milieu, could introduce supplementary factors that affect its influence on cognitive performance (AL-Asmari et al., 2020). The educational landscape of Saudi Arabia, marked by an increasing focus on education and research (Alamri, 2011; Alkhazim, 2003), offers an optimal environment to examine the relationship between cultural customs and academic results. This study aims to close this knowledge gap by exploring whether the regular moderate consumption of Arabic coffee is associated with cognitive functions and overall academic success among Saudi Arabian university students. Through an examination of this distinctive aspect of daily life, our objective is to enhance the overall comprehension of the elements that impact academic performance and well-being in the educational context of Saudi Arabia.

2. Literature review and hypotheses development

Skinner (Skinner, 1965) developed the incentive theory of motivation which can be employed in our study to explain the link between consuming Arabic coffee and its link with student academic performance. The incentive theory of motivation is a behavioral psychological theory that argues that people are regularly motivated by a drive for reinforcement and incentives. It also suggests that people might behave in a way they believe will result in a favorable reward and eliminate practices that may cause punishment. With regard to Arabic coffee consumption, students may be motivated by the observed benefits of enhanced focus, attention, and efficiency associated with caffeine intake. The expectation of these positive results can play as an incentive to consume Arabic coffee. The “Self-Determination Theory” (SDT) (Deci & Ryan, 2004, 2008) can be used as well as a theoretical background of our study. SDT highlights the importance of intrinsic (internal drive) and extrinsic (external reward) motivations in changing people behavior. In terms of Arabic coffee consumption and its impact on academic performance, students may consume Arabic coffee as an intrinsic drive to increase their concentration and cognitive capabilities, driven by particular objectives and ambitions for academic success. Externally, the burden of achieving a higher academic performance or meeting specific deadlines could also drive students to consume Arabic coffee as a means to continue alerted and focused. Furthermore, Atkinson and Feather (Atkinson & Feather, 1966) “Expectancy-Value Theory” which suggests that people behavior is inspired by expectations of accomplishment and the supposed value of the results. In this context, students who think that consuming Arabic coffee will increase their cognitive capabilities and improve academic performance (expectation) and value these advantages (value) are more likely to be provoked to consume Arabic coffee.

2.1. *Arabic Coffee consumption and academic performance*

The cultural and social significance of Arabic coffee extends to higher education in Saudi Arabia. Many universities have on-campus coffee shops and cafes where students gather not only to consume coffee but also to socialize and study (Alfawaz et al., 2020). Arabic coffee serves as a social lubricant, providing students with a break from academic pressures and fostering a sense of community (Aljarboa et al., 2018). The act of preparing and sharing Arabic coffee is considered a symbol of friendship and camaraderie, reinforcing the importance of social connections within the academic environment (AL-Asmari et al., 2020). While the broader literature on coffee and cognitive performance is extensive, studies specifically addressing Arabic coffee consumption and academic performance among Saudi Arabian higher education students are limited. However, research on the general relationship between caffeine consumption and academic outcomes provides some insights (Aljarboa et al., 2018; Barry et al., 2014; Broderick & Benjamín, 2004; Nehlig, 2010). The caffeine content in coffee is known to have stimulant effects, enhancing alertness and reaction time. Moderate coffee consumption has been associated with improved cognitive performance, including attention and mood enhancement (Frery et al., 2005; Nehlig, 2010; Paz-Graniel et al., 2021). However, it is important to study the probable adverse effects of extreme intake of coffee, such as anxiety disorder, limited attention, and bad sleep quality (Barry et al., 2008).

There are numerous motives that can stimulate Arabic coffee consumption among university students and can influence academic performance. The “Motives for Caffeine Consumption Questionnaire” (MCCQ) developed by Ágoston et. al (Ágoston et al., 2018) suggested four dimensions (cognitive enhancement, negative affect relief, reinforcing effects, and weight control) that can be employed to highlight the motives of Arabic coffee intake, as a source of caffeine, among university student’s in KSA. Caffeine, through its refreshing features, is

known to increase focus and cognitive abilities. Several research paper found that the moderate intake of caffeine containing beverage can foster awareness, boost reaction ability, and improve physiological mood, participating to an overall improvement in cognitive enhancement (Barry et al., 2008; Souissi et al., 2008), which can cause to better academic results (Santos et al., 2010). Likewise, the enhanced focus and improved physiological mood may positively impact a student's overall attention and participation in academic activities. Furthermore, students' differences play a key role in how to respond to caffeine intake, and incentives vary for caffeine consumption. Some may digest caffeine as a tool to adopt with academic stress disorder, targeting relief from adverse emotions, while others may intake it for its cognitive-enhancing impacts (Huntley & Juliano, 2012; Kearns et al., 2018). Negative effects incorporate disorders such as stress, anxiety, and depression, which are widely experienced among university students. Previous studies found that caffeine, famous with its stimulating features, may serve as a mood booster and deliver relief from adverse affective conditions (Broderick & Benjamín, 2004).

Caffeine, which exists in Arabic coffee, has reinforcing functions that increase to its regular intake. The reinforcing influences are often linked with the central nervous system stimulation, causing people to search and intake caffeine-containing beverages (Huntley & Juliano, 2012). The relationship between caffeine reinforcing effects and academic performance is intricate. While moderate caffeine intake may offer cognitive benefits, excessive consumption driven by reinforcing effects could lead to negative consequences. Academic performance may be compromised due to factors such as increased anxiety, disrupted sleep patterns, and decreased attention span (Broderick & Benjamín, 2004; James & Rogers, 2005). Balancing the reinforcing effects of caffeine with academic demands is essential for students. Understanding the individual's optimal level of caffeine intake, considering its reinforcing effects, and recognizing signs of dependence are crucial steps in promoting academic success.

The Kingdom of Saudi Arabia ranks among the nations with the highest prevalence of diabetes globally. Research indicates that out of every 100 individuals, 25 are affected by this condition (Abdulaziz Al Dawish et al., 2016; Alwin Robert et al., 2017). Additionally, obesity has emerged as a significant health concern in the country. There is documented evidence indicating a notable rise in obesity rates among the Saudi population since the early 21st century, and this issue continues to be a mounting health challenge (DeNicola et al., 2015; Memish et al., 2014; SS, 2016). Health authorities emphasize that obesity stands as a primary contributor to avoidable fatalities in Saudi Arabia. The country holds the 17th position on the 2022 list of the most obese nations, with approximately 31.73% of its residents classified as overweight (body mass index >25). (World obesity, n.d.). The dual impact of caffeine on appetite and cognitive function prompts inquiries into how students manage these intertwined aspects. While caffeine's ability to suppress appetite may contribute to weight control, excessive consumption can result in adverse effects such as disturbed sleep patterns and heightened anxiety, potentially affecting academic performance (Broderick & Benjamín, 2004). Consequently, the following hypotheses, as illustrated in Figure 1, can be proposed:

H1: Cognitive enhancement (as a motive to consume Arabic coffee) has a positive and significant impact of students' academic performance.

H2: Negative affect relief (as a motive to consume Arabic coffee) has a positive and significant impact on students' academic performance.

H3: Reinforcing effects (as a motive to consume Arabic coffee) has a positive and significant impact on students' academic performance.

H4: weight control (as a motive to consume Arabic coffee) has a positive and significant impact on students' academic performance.

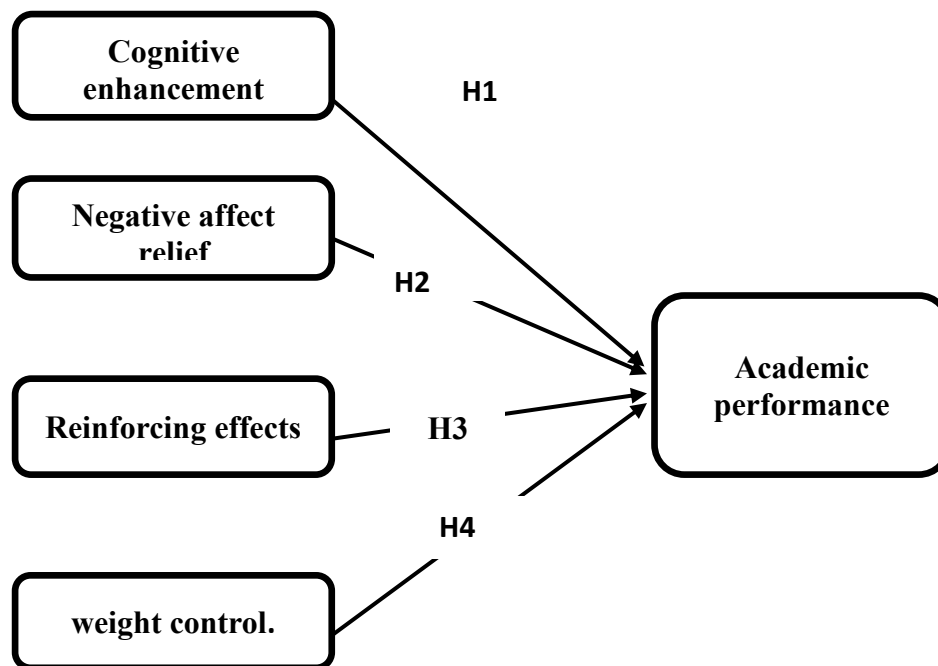


Figure 1: Research framework

3. Material and methods

3.1. Measures and data analysis techniques

All the study measures were derived from previously well-established employed scales that showed good reliability and validity. The questionnaire has three sections, the first one aimed to collect some demographic information about the targeted students such as name, age, type of study, and year of study. The second section collected information about the motives to consume Arabic coffee, and the final section collected information about the students' academic performance. The developed study questionnaire has 24 items. The students' academic performance was measured through the students' self-reporting on their academic performance in the 2023–2024 first semester. Three items were employed to evaluate academic performance and derived from Owusu-Acheaw, Larson (Owusu-Acheaw & Larson, 2014) and Sobaih et al. (Sobaih et al., 2022). The Caffeine Motives Questionnaire (CMQ) developed by Irons et al. (Irons et al., 2014) was employed to measure the motives to consume Arabic coffee. The CMQ scale has four factors that each explain motives of students to consume Arabic coffee (e.g., Cognitive enhancement, reinforcing effects, negative affect relief, weight control). students reply to each question using a Likert-type scale with 5-point (1 = 'I never drink Arabic

coffee for this reason' to 5 = "I always drink Arabic coffee for this reason'). questions were precisely selected from previously validated scales to describe each factor, warranting content validity.

The proposed model was tested by employing partial least squares (PLS v4), a particular way of structural equation modelling (SEM). PLS depends on the variance of the dependent variables and aims to predict the latent variables via input data from practical observations. Its primary central point is maximizing the explained variation of the model components, which are called the latent unobserved variables in this methodology (Hair Jr et al., 2021). The selection of PLS as the study's objective was to forecast and interpret the model's dependent variables (academic performance), rather than testing the overall validity of the proposed model employing global goodness model fit (GoF) indices and other model verification. In this context, the study deliberated to explain the dependent variables and increasing their account for variance through the determination coefficient, as well as the magnitude, direction, and significance of the hypothesized path coefficients.

3.2. Sample and data collection.

Before initiating the collection of the study data, a statistical power test was performed to identify the required sample size to successfully measure the desired effect size. The power analysis test was performed utilizing the program of G*power analysis with predetermined settings suggested by Hair et al. (Hair Jr et al., 2021). As delineated in the below Table 1, for a PLS-SEM containing 4 paths pointing to latent endogenous factor, at least 204 replies are needed to predict 0.10 R² at a level of 0.01% significance value and preserving a 95% statistical power.

Table 1. Sample size adequacy.

F value	Effect Size		Suitable sample size
	Lowest R ²	Sig. (5%)	
F = 3.396	0.10	0.95	204
F = 3.512	0.25	0.95	100
F = 3.711	0.50	0.95	51
F = 3.908	0.75	0.95	35

Source: authors.

Consequently, we decided to gather a more extensive sample size for our study. The justification behind this decision of targeting higher sample size came from our desire to alleviate the potential barriers that could arise during the process of data collection, such as high missing data, a low rate of response, or uncompleted questionnaires. A convenience sample method was used to collect the required data from students enrolled in different study area and level at King Faisal University, Kingdom of Saudi Arabia. A survey questionnaire was distributed via drop and collect methods during the months of February and March 2024. 700 questionnaires were distributed, and 650 were found to be valid with no missing answers with a response rate of 92%. At the beginning of the questionnaire, the students were informed about the nature and objectives of our study and their freedom to stop involvement at any point. The majority (60 %) of participants were male (360) and not married 80 % (520), equally 25 % were in their first and second year of study and 20 % were in their third year while 30 % in the final year. Participants from social science colleges (business, arts, education, law) dominated the study participation with 70 % while only 30 % of participants were from social science colleges (engineering, computer, medical, science). As the questionnaire was designed to

collect independent and dependent questions from the same student, common method variance (CMB) might be an issue. To deal with this issue all the employed items in the study scale were subject to exploratory factor analysis in SPSS program without any rotations and the extraction were constrained to the score of 1 to as per Harman's (Harman, 1976) suggestions. The results revealed that the single extracted factor explains only 39% of the total variance. Therefore, it is unlikely that CMB affects significantly the study data.

4. Results

4.1. Reliability and validity

The developed measurement model went through an assessment that required the analysis of the employed five latent variable consistency, "average variance extracted" (AVE), and discriminant validity (See Table 3). To evaluate the internal consistency of the study factors, we inspected the single and "composite reliability" (CR) of all study constructs. The output of the measurement model evaluation is shown in Table 3. Then, we assessed the factors convergent validity employing the AVE criteria. A value of 0.5 for AVE or above is needed to verify the existence of this type of validity [35]. As illustrated in Table 3, the latent variables in this study demonstrated both single and CR, as well as convergent validity. The measurement model discriminant validity was evaluated through two extensively documented methods: the well-recognized Fornell and Larcker metric (Table 4) and the up to date and accurate heterotrait-monotrait (HTMT) ratios metric (Table 5) (Chin, 2001; Leguina, 2015). For theoretically comparable factors, HTMT values exceeding 0.9 designate the occurrence of discriminant validity, whereas HTMT values below 0.85 are indicators of discriminant validity for theoretically unrelated constructs (Hair Jr et al., 2021). regarding the Fornell-Larcker metric, it is convinced when the AVE square root value for each factor surpasses the anticipated correlation between each pair of factors.

Table 2: Model validity and reliability results

Items	Loadings	t-value	P value	VIF	Dimension	α value	CR	AVE
AP 1	0.862	78.208	0.000	1.847	Academic performance	0.810	0.888	0.725
Ap 2	0.838	55.552	0.000	1.697				
Ap 3	0.854	62.349	0.000	1.778				
CE 1	0.835	74.237	0.000	2.731	Cognitive enhancement	0.936	0.949	0.757
CE 2	0.867	59.952	0.000	3.319				
CE 3	0.830	50.598	0.000	2.532				
CE 4	0.890	76.266	0.000	3.622				
CE 5	0.900	11.980	0.000	4.203				
CE 6	0.897	11.263	0.000	3.964				
NAR 1	0.924	13.629	0.000	3.372	Negative affect relief	0.859	0.935	0.827
NAR 2	0.941	23.376	0.000	3.697				
NAR 3	0.860	50.248	0.000	2.130				
RE 1	0.843	61.877	0.000	4.023	Reinforcing effects	0.943	0.952	0.688
RE 2	0.887	91.367	0.000	2.274				
RE 3	0.855	50.532	0.000	3.717				
RE 4	0.821	52.259	0.000	3.529				
RE 5	0.853	66.109	0.000	3.600				
RE 6	0.801	39.784	0.000	4.815				

RE 7	0.751	25.959	0.000	3.616				
RE 8	0.833	59.177	0.000	16.998				
RE 9	0.812	41.299	0.000	4.853				
WC 1	0.961	22.106	0.000	3.152	Weight control	0.956	0.966	0.934
WC 2	0.966	33.223	0.000	3.934				
WC 3	0.972	78.023	0.000	3.927				

Table 3: Fornell-Larcker criterion

	Academic performance	Cognitive enhancement	Negative affect relief	Reinforcing effects	Weight control
Academic performance	0.951				
Cognitive enhancement	0.743	0.870			
Negative affect relief	0.767	0.831	0.909		
Reinforcing effects	0.637	0.752	0.762	0.829	
Weight control	0.610	0.811	0.824	0.757	0.966

Table 4: Heterotrait-monotrait ratio (HTMT) - Matrix

	Academic performance	Cognitive enhancement	Negative affect relief	Reinforcing effects	Weight control
Academic performance					
Cognitive enhancement	0.831				
Negative affect relief	0.811	0.707			
Reinforcing effects	0.769	0.710	0.828		
Weight control	0.815	0.804	0.803	0.792	

Furthermore, we calculated the collinearity between the exogenous dimensions associated with a specific endogenous factor (Leguina, 2015) collinearity problems could occur when VIF scores exceed the level of 5. In our analysis, all the VIF scores persisted below 0.5 (Table 3), distinctly indicating that collinearity is not a problem.

4.2. Assessment of the structural model.

To evaluate the significance of the structural model, a bootstrapping approach was subsequently conducted at a significance p value level of 5%, employing 5000 subsamples (Table 5) (Chin, 2001; Hair Jr et al., 2021; Leguina, 2015; Wetzels et al., 2009). The study hypotheses were statistically assessed (Figure 2), with hypothesis H1 being supported ($\beta=0.183$, t value =3.722, p value < .001), which indicates that cognitive enhancement as a motivator to consume Arabic coffee can positively and significantly affect students' academic performance. Hypothesis H2 ($\beta=0.309$ t value =12.921, p value < .001) was supported, which gives evidence that negative affect relief as a motivator to digest Arabic coffee can positively and significantly improve academic performance of higher education students. Furthermore, hypothesis 3 was validated ($\beta=0.513$ t value =12.669, p value < .001), indicating that reinforcing effect of digesting Arabic coffee significantly and positively influence the academic performance of the targeted students. Interestingly, hypotheses 4 was not validated ($\beta=0.018$ t value =0.999, p value =0.318), which indicates that weight control as a motivator of students to digest Arabic coffee failed to improve academic performance.

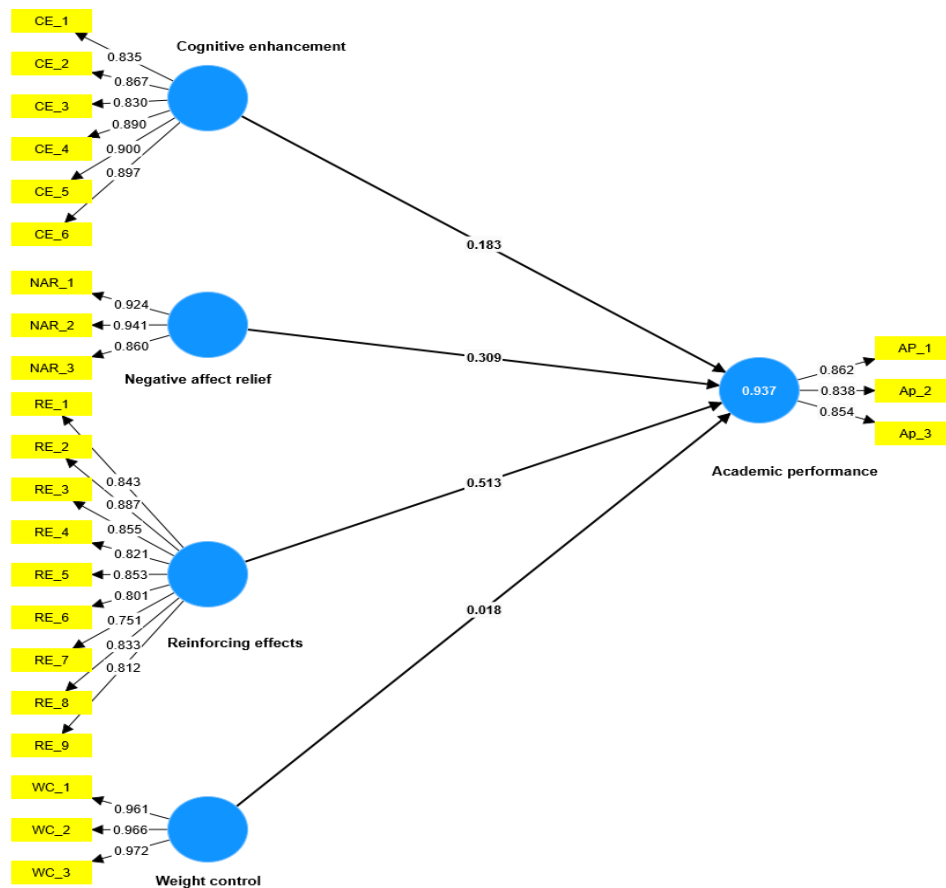


Figure 2. Empirical Model.

Table 5: The results of the structural model

Hypotheses	β	T statistics	P values
Cognitive enhancement -> Academic performance	0.183	3.722	0.000
Negative affect relief -> Academic performance	0.309	12.921	0.000
Reinforcing effects -> Academic performance	0.513	12.669	0.000
Weight control -> Academic performance	0.018	0.999	0.318

5. Discussion and implications

Arabic coffee, which can be categorized as a beverage that contain caffeine, has a cognitive-enhancing properties. Consuming a beverage containing caffeine (such as Arabic coffee) can trigger the body’s central nervous system, which can increase alertness, enhance attention, and improve cognitive functions (Nehlig, 2010). The results of our study give evidence that consuming Arabic coffee has a cognitive enhancement ability that can positively enhance students’ academic performance. This result is consistent with the study of Smith et al. (Smith & Tola, 2019) who proven that moderate caffeine consumption was linked with high cognitive ability and academic performance of university students. The intake time and dose of Arabic coffee can affect its cognitive-enhancing impacts. studies propose that moderate caffeine consumption, from 100 to 200 mg (equivalent to about 25 to 50 cups of Arabic coffee), is

connected with cognitive advances without substantial negative side effects (Temple et al., 2017).

The PIS-SEM model that was assessed in our study showed that negative affect-relieve as a motive to consume Arabic coffee was positively associated with high academic performance among university students. The intake of Arabic coffee can play as an effective motivator for students by granting relief from adverse affective conditions regularly suffered during academic activities. The ritualized aspect of making and preparing Arabic coffee, paired with its remarked mood-improving effects, can generate a positive emotional state contributing to enhancing focus, learning, and academic performance. This result is consistent with (Fredrickson, 2001; Lara, 2010; Lyubomirsky et al., 2005). who argued that consuming a caffeine containing beverage is associated with postulating relief from adverse affective disorders such as stress, and anxiety. This relief from adverse disorders may play a key role in enhancing students' overall academic performance.

The study results showed as well that reinforcing effect, as a motive to consume Arabic coffee, can act as a powerful reinforcement tool for improving academic performance among university students. The expectancy of the rewarding consequences of Arabic coffee consumption, such as increased alertness and attention, can motivate students to energetically contribute to the learning process, leading to improved learning consequences. This result is consistent with the results of the study of (O'Brien & Kinnaird, 2003; Pitzer & Skinner, 2017; Reed et al., 2019; Schuster & Mitchell, 2019) Which revealed a positive correlation between positive reinforcement and academic performance. Intake Arabic coffee, with its reinforcing effects, may likewise positively influence academic performance. Finally, the study results indicated that while weight control can be a motive for some university students to intake Arabic coffee, its positive effect on enhancing academic performance seems insignificant. Some students may digest, on a regular basis, Arabic coffee with the confidence that it can help in weight control being a low-calorie ingredients beverage (regularly consumed without added sugar). However, Arabic coffee is regularly consumed with fresh or preserved dates. The sweet taste of dates counterparts the sour and strong bitter taste of Arabic coffee, creating an equivalent balanced taste experience. This might contribute to increasing body weight and fail to control it. Furthermore, studies on the direct impact of Arabic coffee consumption on weight control are scarce, and its role as a motive for improving academic performance stays inconclusive.

The study contributes theoretically to enhance our understanding of the nature of the relationship between the motives to intake Arabic coffee and student academic performance. Furthermore, universities and decision makers can deliver education and instructions on adequate dosage of Arabic coffee intake, including data on ideal intake levels of caffeine, and probable health consequences. Universities can also combine stress control initiatives that incorporate practices like Arabic coffee breaks as part of relaxation or mindfulness workshops. Educating university students about healthy stress coping practices and the probable mood-improving impacts of Arabic coffee can enhance emotional and mental health, eventually promoting academic performance. Universities can also combine stress control initiatives that incorporate practices like Arabic coffee breaks as part of relaxation or mindfulness workshops. Educating university students about healthy stress coping practices and the probable mood-improving impacts of Arabic coffee can enhance emotional and mental health, eventually promoting academic performance.

6. Limitations and future study opportunities.

The current study investigated the impact of consuming Arabic coffee on academic performance, however other beverages (i.e. tea, Turkish coffee, or and black coffee) can have an impact on the academic performance. Further studies can investigate the impact of different caffeine containing beverages on student academic performance and compare the results. Furthermore, future research can conduct a longitudinal study to evaluate the endured effects of consuming Arabic coffee and its impact on academic performance, considering students variations and impending interactions with different lifestyle dimensions. Additionally, integrating moderating variables in the current study model such as caffeine intake time, type of coffee used to make Arabic coffee, and gender can help clarify the distinction impact of Arabic coffee on student academic performance.

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الملخص باللغة العربية:

تأثير استهلاك القهوة العربية على الأداء الأكاديمي في المملكة العربية السعودية

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القهوة هي مشروب يتم استهلاكه عالمياً وقد خضعت لأبحاث مكثفة لاستكشاف تأثيرها على صحة الإنسان وأدائه. وبشكل خاص فيما يتعلق بطلاب التعليم العالي، فقد أثار تأثير استهلاك القهوة على الأداء الأكاديمي اهتماماً كبيراً. وقد اقترحت أبحاث مختلفة أن تناول القهوة بشكل معتدل يمكن أن يحسن بشكل إيجابي أداء الطلاب الأكاديمي من خلال تحسين الوعي والقدرة الإدراكية. ومع ذلك، فإن استهلاك القهوة بشكل مفرط يمكن أن يؤدي إلى نتائج سلبية على أداء الطلاب الأكاديمي، بما في ذلك اضطرابات القلق وانعدام التركيز ونوم مضطرب. في المملكة العربية السعودية، انتشر استهلاك القهوة العربية كجزء من العادات والتقاليد الثقافية والاجتماعية؛ فتناول القهوة العربية عادة شائعة بين طلاب الجامعات. إن ثقافة شرب القهوة جزء لا يتجزأ من أسلوب حياة الطلاب اليومي. بالنسبة للعديد من الطلاب، توفر هذه المشروبات استراحة من الضغوط الأكاديمية التي قد يواجهونها. إنها تعمل كأداة لطلاب الجامعات لتشكيل روابط مع زملائهم في الجامعة. في حين أن استهلاك القهوة العربية منتشر بشكل كبير في الثقافة السعودية، فإن تأثيره المحتمل على الأداء الأكاديمي لطلاب الجامعات يظل موضع جدل. تهدف الدراسة الحالية إلى سد هذه الفجوة من خلال التحقيق في تأثير الدوافع (مثل تعزيز التفكير، وتخفيف العواطف السلبية، والتأثير التعزيزي، والتحكم في الوزن) لاستهلاك القهوة العربية على الأداء الأكاديمي لطلاب الجامعات.

الكلمات الدالة: دوافع الاستهلاك، القهوة العربية، الأداء الأكاديمي، المملكة العربية السعودية، التحكم في الوزن.