

Prevalence of the combined use of Caffeine with other Substances among Undergraduate Students of Nnamdi Azikiwe University, Awka. Anambra State. Nigeria.

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ABSTRACT

Caffeine use with other substances is a growing concern among university students worldwide, with potential negative effects on their physical and mental health. Students no longer consume caffeine alone but combine caffeine with various other substances like alcohol, energy drinks, carbonated drinks, and many others for various reasons. This study aimed to determine the prevalence of the combined use of caffeine use with other substances among students in four different faculties of Nnamdi Azikiwe University, Awka. A cross-sectional study was conducted among 375 students from four faculties, namely, Health Sciences, Law, Pharmacy, and Architecture. Data were collected using a self-administered questionnaire and analyzed using descriptive statistics and a chi-squared test. The overall prevalence of caffeine use with other substances was 48.8%. Students in the Health Sciences faculty had the highest prevalence rate (21.3%), followed by those in the Law faculty (9.9%), the Pharmacy faculty (9.3%), and the Architecture faculty (8.3%). Significant differences were found in the prevalence rates among the four faculties ($p < 0.001$). This study highlights the need for targeted interventions to address caffeine use in conjunction with other substances among university students. The findings also suggest that students in health-related fields may be at higher risk of substance use and may require specialized support services.

Keywords: Caffeine, other substances, prevalence, Nnamdi Azikiwe University, undergraduate, Students.

INTRODUCTION

Caffeine is a common stimulant that can be found in a variety of goods, such as tea, coffee, energy drinks, and some prescription drugs, and it is widely used by students, who frequently depend on it to stay awake and concentrated during extended study sessions (Kamimori et al., 2015).

The most common source of caffeine is identified as coffee, as it is often readily available to individuals (Alsharif et al, 2018; Mahoney et al, 2019; Jahrami et al, 2020). Other major sources of caffeine consumed specifically by college students include, tea (black and green), chocolate, carbonated soft drinks, energy drinks, cocoa, and medications or dietary

supplements (Alsharif et al, 2018; Kepershoek et al, 2018; Mahoney et al, 2019; Jahrami, et al, 2020; Eduviere et al, 2021; Zahra et al, 2021). A growing problem among students is the co-use of caffeine with other substances, including alcohol, tobacco, and illegal narcotics (Terry-McElrath et al., 2017). In the Journal of American

College Health, 81.2% of undergraduate students reported drinking caffeine regularly, while 34.5% reported consuming both caffeine and nicotine (O'Brien et al., 2018).

This co-use can result in negative health outcomes, such as elevated blood pressure and heart rate, anxiety, and dehydration (Harrison & Horne, 2000). According to Kessler et al. (2005), using caffeine and other drugs together can also raise the risk of addiction and substance use disorders. Research on the prevalence of co-use of caffeine and other substances among students is scarce, despite the possible hazards involved (Tackett et al., 2015). Although the amount of this co-usage is unclear, the literature currently indicates that students who consume caffeine are more likely to use other substances (O'Brien et al., 2018). Moreover, little research has been done on the variables that influence this co-use, including mental health, academic achievement, and demographic traits (Tackett et al., 2015).

Few studies, nevertheless, have looked into students' co-use of coffee and other drugs, despite the possible dangers connected with this behavior. The purpose of this study is to find out how common the combined use of caffeine, in combination with other substances, is among undergraduate students of Nnamdi Azikiwe University, Awka, and factors that contribute to the co-usage.

MATERIAL AND METHODS

This study utilized a descriptive cross-sectional study design. This study was carried out among undergraduate students of Nnamdi Azikiwe University, Awka, Anambra State, Nigeria, in four Faculties: Architecture, Pharmaceutical Sciences, Law, and Health Sciences. The research design consisted of questionnaires distributed to second-year to fifth-year students of the four Faculties. The purpose of the study was made known to the students, and their consent was obtained, before the questionnaires were self-administered and collected back after the respondents finished filling them.

Study Population and Sample Size Determination.

This study involved the second-to-final-year undergraduate students of the faculties of Law, Architecture, Health Science, and Pharmaceutical Science of Nnamdi Azikiwe University, Awka. The sample size was determined using Yamane's formula with an estimated attrition rate of 5%. The sample size obtained was 375 and stratified according to the four faculties under the study. Health Science got 170 questionnaires, Pharmacy got 50, Law got 80, and Architecture got 75.

Instrument Development and Validation

The research tool was a semi-structured questionnaire, which was adapted, validated, and pre-tested before it was used to collect data.

Data Analysis

Upon retrieval, the questionnaires were meticulously organized and scrutinized according to each faculty under study to ensure their overall quality and precision before the data analysis process. The data were analyzed using quantitative and inferential statistical approaches. Frequency, tables, and graphs were produced using STATA15, and the outputs were exported to MS Excel as well as MS Word for document framing and designing. The chi-square test was used to assess the association between the use of caffeine and the combined use of caffeine with other substances, as well as the differences between study locations. The confidence level was at 95%, and the threshold loop value was at 5%.

Ethical Considerations

The ethical approval for the study was obtained from the Research and Ethics Committee of Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Anambra State, with Reference number: NAUTH/CS/66/VOL.17/VER.3/162/2025/247 of 26th February, 2025.

Informed consent was obtained from the participants, and respondents' confidentiality was maintained at all times to avoid bias.

RESULTS

Demographic results

The demographic results (Table 1) provide insights into the characteristics of the 375 respondents. It shows that the sample was slightly skewed towards males, with 52.8% male and 47.2% female respondents. Regarding academic level, the majority were from the 300 level (31.7%), followed by the 400 level (29.1%), the 500 level (25.9%), and the 200 level (13.3%). Most respondents fell within the age range of 22-25 years (44.1%), followed by a percentage of 18-22 (29.0%), then in the 26-30 years range (28.9%). In terms of faculty distribution, Health Science had the highest representation (45.1%), followed by Law (21.3%), Architecture (20.3%), and Pharmaceutical Sciences (13.3%).

Table 1: Caffeine consumption and use among students.

Variable	Pharmacy		Architecture		Health		Law	
	N	P	N	P	N	P	N	P
Do you consume caffeine								
Yes	40	80.1	55	73.3	145	80.6	63	78.8
No	10	19.9	20	26.7	41	19.4	17	21.2

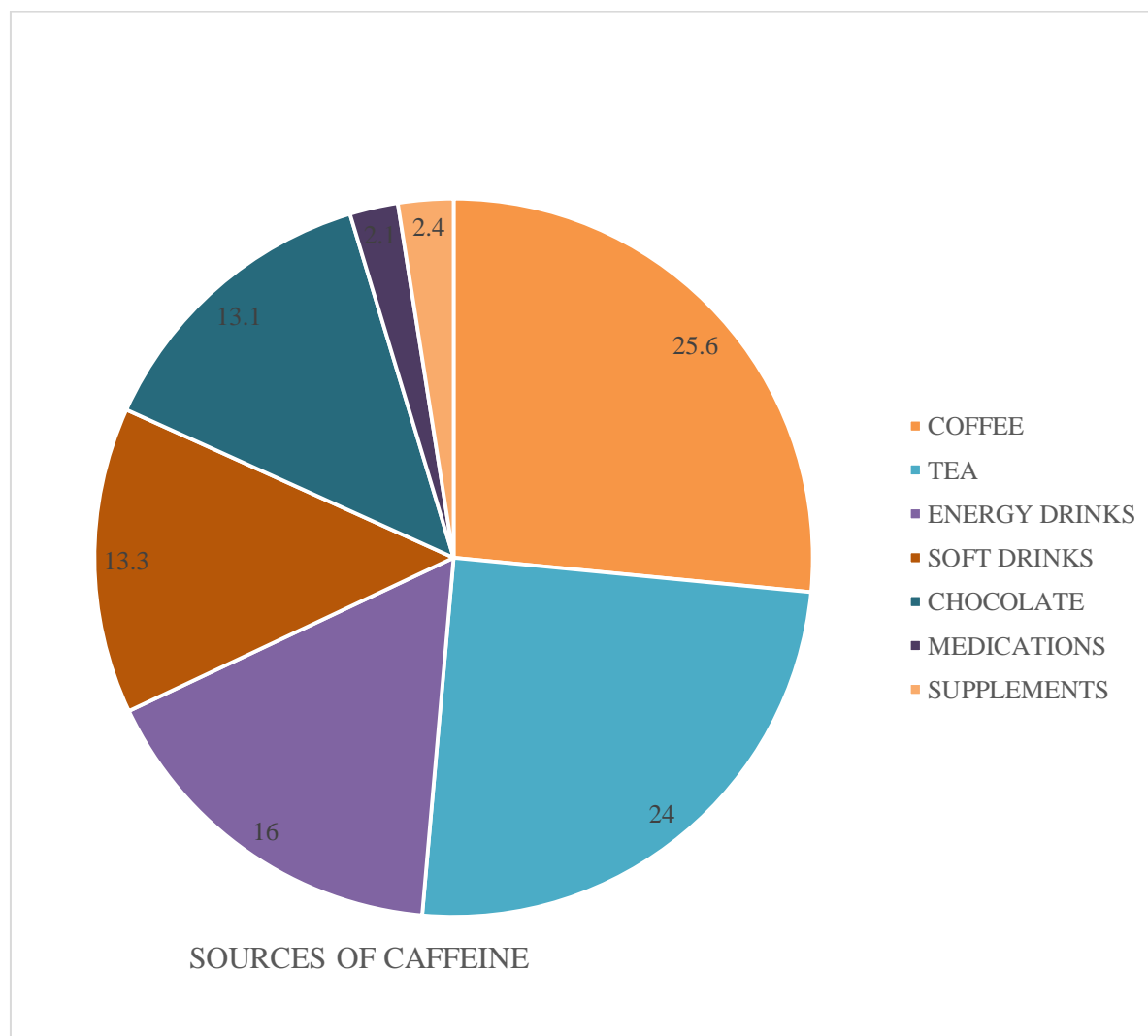


Figure 1. Source of caffeine Caffeine consumption with other substances

Table 3. Caffeine consumption and combination with other substances.

Variable	Pharmacy		Architecture		Health		Law	
	N	P	N	P	N	P	N	P
Do you use caffeine with other substances?								
Yes	35	70	31	41.3	80	47.1	37	46.3
No	15	30	44	58.7	90	52.9	43	53.7
Which substances do you typically use with caffeine?								
Alcohol	0	0	0	0	7	9.3	40	23.5
Energy drinks	21	26.3	14	28	15	20	34	20
Nicotine	0	0	13	26	3	4	6	3.5
Carbonated drinks	14	17.5	0	0	12	16	8	4.7
Tramadol	0	0	3	4	8	4.7	0	0
Prescription med	1	2	1	1.3	14	8.2	1	1.3
Rec/Sports Med	0	0	4	5.3	2	1.2	5	6.3
Lacasera, Coca Drinks	4	8	4	5.3	4	2.4	0	0
Alcoholic beverages	1	2	2	2.7	0	0	0	0
Alcoholic beverages	1	2	2	2.7	0	0	0	0
Others	0	0	0	0	0	0	0	0

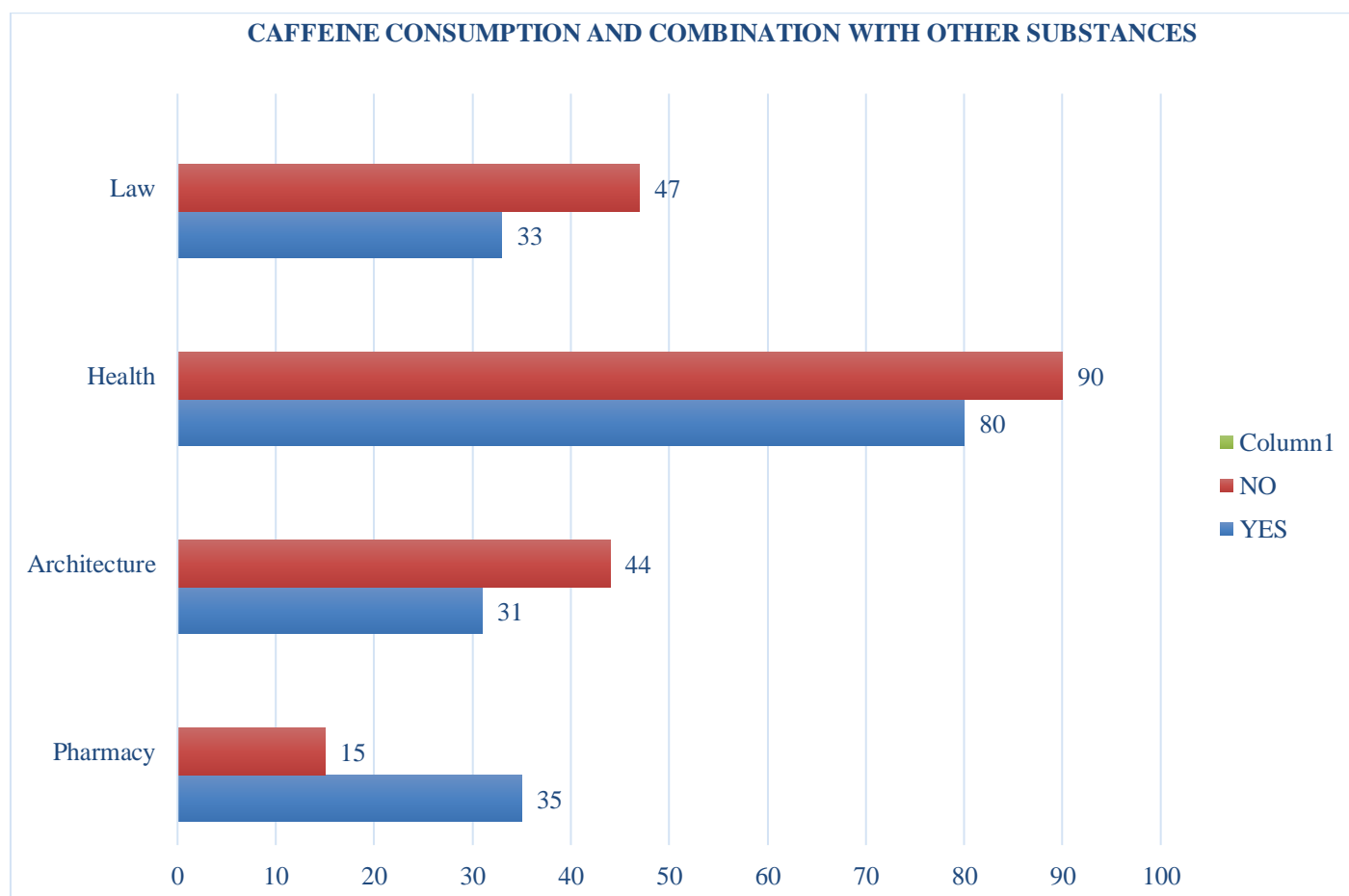


Fig. 2 Caffeine consumption with other substances across faculties.

Reasons / Motivations for use.

Caffeine is mostly combined with other substances due to its perceived synergistic effects. There are different reasons why people use caffeine with other substances. From the table below, the provided reasons include; to improve focus, to stay alert, to cope with stress, academic pressure, peer influence, depression.

Table 4

Variable	Pharmacy		Architecture		Health		Law	
	N	P	N	P	N	P	N	P
What is the primary reason why you use caffeine with other substances?								
To improve focus	5	10	2	2.7	12	7.1	5	6.3
Stay alert	12	24	18	24	39	22.9	11	13.8
To cope with stress	6	12	8	10.7	16	9.4	7	8.8
Academic pressure	5	10	6	8	16	9.4	4	5
Peer influence	1	2	6	8	8	4.7	1	1.3
Rec purposes	9	18	18	24	24	14.1	9	11.3
Depression /anxiety	1	2	0	0	0	0	2	2.5

Awareness and knowledge base

This section gives some insight into the awareness and knowledge base of the study participants about the use of caffeine, together with other substances, and the health risks associated with using caffeine together with other substances, and their first sources of knowledge.

Table 5: Awareness of combined use of caffeine with other substances.

Variable	Pharmacy		Architecture		Health		Law	
	N	P	N	P	N	P	N	P
Do you know about the use of caffeine with other substances?								
Yes	43	86	55	73.3	142	83.5	62	77.5
No	7	14	11	26.7	28	16.5	18	22.5
Do you know about the interactions and effects of combination of caffeine with other substances?								
Yes	39	78	23	30.6	119	70	28	35
No	11	22	52	69.4	51	30	52	65
Do you think that there is enough awareness and information about the dangers of using caffeine together with other substances?								
Yes	7	14	10	13.3	21	12.4	11	13.8
No	43	84	60	85.7	141	82.9	66	82.5

Prevalence of Caffeine consumption in the surveyed department, and association between Departments on Caffeine Consumption

Department	Student consumption of caffeine		Chi Square Test	
	No	Yes	Pearson chi-square	P value
Pharmacy	10	40		
Architecture	20	55		
Health	35	145	0.99	0.0001
Law	17	63		

Association between Departments and Caffeine Consumption with other substance

Department	Student consumption of caffeine		Chi Square Test	
	No	Yes	Pearson chi-square	P value
Pharmacy	15	35		
Architecture	42	31		
Health	90	80	0.834	0.0001
Law	47	33		

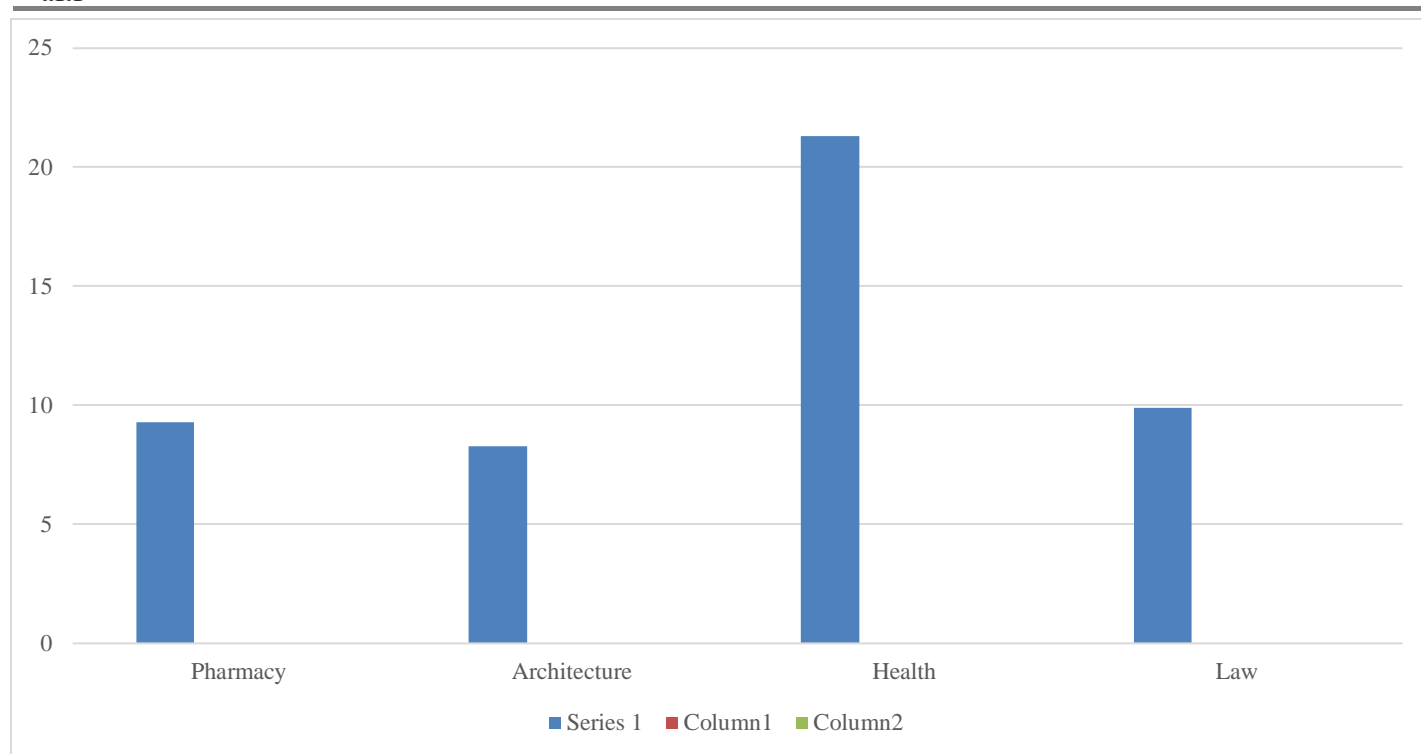


Figure 8: Prevalence of Caffeine consumption in the surveyed department.

DISCUSSIONS

The findings from this study, as shown above, showed the prevalence of the combined use of caffeine with other substances among undergraduate students of Nnamdi Azikiwe University Awka, Anambra state.

The study, showed that the faculty with the highest prevalence is the SFaculty of Health Science, with a prevalence of 21.3% of the population, followed by Faculty of Law, 9.9%, Architecture 9.3% and then Pharmacy 8.3%. This finding is consistent with studies conducted among these disciplines, which has shown that students in health-related fields tend to experience higher levels of stress and burnout, which can contribute to increased substance use (Dahne 2020, Oyewole et al., 2018, Adelekan et al., 2018). The Law faculty has a relatively lower prevalence rate of 9.9%. This finding is consistent with a research, by some scholars, which shows that law students tend to have different coping mechanisms and stress management strategies compared to students in other fields (Rachel et al, 2019, Ojo et al, 2019, Ogunwale 2020). The Pharmacy of faculty has a prevalence rate of 9.1%, which is similar to the Law faculty and also not surprising, given that pharmacy students often have demanding coursework and clinical requirements that can contribute to stress and substance use (Khan, T. M., & Al-Shammari, A. R. 2020).

Lastly, the Architecture faculty, has the lowest prevalence rate of 8.7%. This finding is consistent with research that has shown that students in creative fields tend to have lower rates of substance use compared to students in other fields (Zakin, G., & Zamani, S. (2019).

A high percentage of students consume caffeine as seen in the results with the lowest percentage being 73.3%. A study of university students in Nigeria found that 45.5% of participants reported drinking caffeine-containing substances on a daily basis, and 71.4% of respondents reported consuming such goods (Ezuma et al., 2019).

This study also showed that 45.4% of participants reported positive to the use of caffeine with other substances and 54.6% of students reported negative for consumption of caffeine with other substances. Among the common substances listed which are combined with caffeine, energy drinks has the highest percentage of 35%, followed by alcohol that is 20%, then carbonated drinks, coke and Lacasera that is 19%. The least used in combination with other substances include medicines which is at 12%, nicotine 9% and tramadol 5%. 30% of the users affirmed to experience negative effects when they combine caffeine with other substances. For the individual faculties, Health Science takes the lead again, followed by Pharmacy, then Law and architecture.

The study also showed that academic performance, improved focus, desire to stay awake, and management of stress, were among the main reasons why students use caffeine together with other substances.

For awareness, the findings of this study shows that there's more awareness about the use of caffeine together with other substances and their interactions among the science students than their counterparts.

According to a study conducted by Adeyeye et al in 2017, 46.3% of students said they used caffeine to improve their academic performance, while 55.6% said they used it to stay awake during tests. Similarly, 81% of respondents to a study of college students in the United States said they drank caffeine, with 30% saying they did so every day (McCabe et al., 2013).

CONCLUSION

In conclusion, the findings of this study shed light on the prevalence, patterns, and awareness of the combined use of caffeine with other substances among undergraduate students at Nnamdi Azikiwe University. Caffeine use in combination with other medicines/substances is a serious public health concern that needs more research. Although research indicates that this behavior is frequent among many populations, especially teens and young adults, its prevalence varies throughout the world. Academic pressure, peer pressure, stress, and the desire to improve mood and cognitive performance are some factors driving this behavior. Students may turn to stimulants like caffeine to stay awake and attentive during extended study sessions, especially when they are under academic pressure. Peer pressure is also important since people may feel pressured to use drugs to blend in with their social group.

Caffeine use in combination with other drugs has complicated and multidimensional health effects that can include a higher risk of addiction, heart complications, mental health disorders, and cognitive decline. It is crucial to create efficient prevention and intervention plans to deal with this problem, such as campaigns for education and awareness, in order to educate people about the dangers of coffee and poly-substance usage. To find and help those who are battling addiction, substance use screening and counselling services should be provided in our institutions of higher learning. Study skills courses and tutoring are examples of academic support services that assist students in coping with the demands of their studies. Initiatives led by peers to encourage healthy living and lessen peer pressure to use of drugs should be encouraged in the society. Understanding the correlates and effects of caffeine and poly-substance use, especially in high-risk populations, should be the main goal of future studies. By working together, we can reduce the prevalence of this behavior and promote healthier lifestyles among individuals worldwide.

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