



**The Association between English as a Foreign Language
(EFL) Reading Comprehension Achievement and
Substance Use among Jimma University Undergraduates,
Ethiopia**

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Abstract

This study investigated the relationship between EFL reading comprehension achievement and substance use among undergraduate students in Jimma University. Data were collected from a sample of second and third year students (N= 802) randomly selected from four colleges. The data collection instruments used in the study were pretested structured questionnaire and standardized reading comprehension test. Descriptive and inferential statistics were used to analyze the data. P-value < 0.05 was used as a cut-off point for statistical significance. The findings revealed that substance use had some association with students' EFL reading comprehension achievement. Prolonged use of substances, onset of substance use (before university enrolment vs. after university enrolment) and frequency of alcohol intake had significant associations with students' reading comprehension achievement.

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However, the association between substance use and reading comprehension achievement is not straightforward since various factors determine the relationship between the two variables. Further studies are necessary to establish a clear understanding of the association between substance use and achievement in EFL reading comprehension.

Keywords:EFL;Ethiopia;Reading Comprehension Achievement; Substance use; Undergraduates.

1. Introduction

1.1. Background of the study

In Ethiopia English is used as a Foreign Language (EFL). It serves as a medium of instruction in the majority of academic disciplines in Ethiopian universities. In addition, English courses such as *Communicative English Skills* and *Basic Writing Skills* are offered as common courses to university undergraduates. Thus, students engage in tremendous EFL reading beginning from their entry to universities until their graduation. Learning English as a foreign language makes the task of reading and comprehending English texts difficult. Reading a multitude of texts and comprehending massive information can thus result in cognitive overload and frustration, leading to what is known as foreign language reading anxiety [1]. Additionally, since the huge reading tasks take a long time, they require students to develop persistence and stamina to adjust to the university context. As a result, some university students are likely to look for ways presumed to enable them to improve endurance and comprehension ability. One of the options in this circumstance can be substance use like khat chewing along with intake of other concomitants.

*Catha edulis*Forsk, commonly known as *Khat* in Ethiopia, and it is now referred to consistently in the literature as khat, has been found to be a socially and economically important plant all over East and South Africa as well as in the Arabian Peninsula [2]. Khat contains a psychoactive substance, cathinone, which produces central stimulation analogous to amphetamine. For its euphoric effect, it is widely abused and highly praised in East Africa, including Ethiopia, and the Arabian Peninsula. The use is deeply anchored to regional customs and traditions [3]. Assuming that it makes them mentally alert and work hard, college and university students use it. Perhaps, the central stimulating effect of cathinone is enhanced when khat is used in combination with caffeine and cigarette smoking [4].

In Ethiopia, khat is commonly used for social recreation. Occupational groups such as motor vehicle drivers who chew khat during long distance driving to keep themselves awake also use it under a variety of conditions. Further, a significant number of students chewkhat especially during examination periods with the belief that it keeps them mentally alert. Furthermore, craftsmen and farmersand traditional drug healers use khat to reduce physical fatigueand to heal ailments respectively[5].

Khat is used in different combinations. If chewed alone, it has a bitter taste. To avoid this, it is usually taken in combination with sugar. Khat chewing is also combined with cigarette smoking to enhance the degree of excitement. Most often, alcoholic beverages are also taken after khat chewing to terminate excitation [6]. In this case, a combined effect of drugs, which should be researched, can be observed.

1.2. Statement of the problem

English is used as a means of communication among people throughout the world. It is used in different domains of life such as education, business, health, etc. In the domain of education, where the medium of instruction is English, students need to be sufficiently equipped with the four major English language skills-listening, speaking, reading and writing. Since much of school learning involves reading comprehension, which fosters analysis and synthesis of information from various sources, it is particularly important for students. Especially, undergraduates are expected to comprehend what they read so that they can analyze, criticize, evaluate and synthesize information from a wide range of print and electronic texts [7]. In this era of information exploration, in which the value of reading is unquestionably increasing, university students (the future hopes of nations) are expected to develop the ability and the love for life-long reading.

However, many students worldwide find university reading as a challenging task. They lack comprehension skills-they cannot read effectively and understand fully the materials they are assigned to read [8]. In the United States of America, a large proportion of students had difficulty in reading and comprehending informational texts. In China, many college students have problems in reading technical texts [9]. In South Africa, a significant number of undergraduates are not adequately prepared to deal with challenging reading tasks [7].

In Ethiopian higher education, too, many students are not able to adequately comprehend the texts they are required to read. This in turn adversely affects their academic performance. Thus, thinking that substance use enables them to keep alert mentally while reading and to perform better academically, a number of undergraduates are engaged in khat chewing, cigarette smoking and alcohol intake. This is particularly common during exam periods [10]. Other previous investigations have also shown that low academic achievers are more likely to smoke cigarettes, drink alcohol, and use marijuana and other illicit drugs [11]. According to a study conducted in Axum University, 40.6% of the students who participated in the study used khat, alcohol and cigarette to become alert while reading [12]. As an informal interview made with some Jimma University undergraduates who used substance (khat, cigarette and alcohol) indicates, substance use was assumed to enable them to become alert during study, to comprehend reading materials effectively, and to perform better academically. However, studies revealed that while khat chewing, cigarette smoking and alcohol intake cause stress [13], khat chewing, cigarette smoking and shisha use are significantly associated with depression [14].

Research findings with regard to the relationship between substance use and academic performance (i.e., average grades in the last semester or grading period) are conflicting. While some studies [11, 15] reported negative relationship between drug abuse and academic performance, other studies showed insignificant relationship between the academic performance of substance users and that of non-abusers [16]. A study conducted by Andualem and Zeleke [11], on Jimma University undergraduates, concluded that khat chewing may not help to improve academic performance. However, these studies have not clearly verified the association between substance use and EFL reading comprehension performance. Thus, this study was set out to examine the association between substance use (khat chewing, cigarette smoking and alcohol intake) and undergraduate students' achievement in EFL reading comprehension.

1.3. Significance of the study

The purpose of the current study is to examine the association between substance use and EFL reading comprehension of under graduate students. A number of students are engaged in substance use (khat chewing, cigarette smoking and alcohol intake) assuming that doing so helps them to perform better academically. Therefore, the findings of this study can help students to make informed decisions instead of indulging in substance use based on mere presumption. The investigators also believe that the findings of the study can help to develop strategies to eliminate doubts concerning the relationship between substance use and EFL reading comprehension. Further, the study can serve as a baseline study for subsequent related studies using more rigorous research designs, i.e., case control within the same target group of the present study or other target groups.

1.4. Scope of the study

This study was conducted in four colleges in Jimma University from April 2014 – May 30, 2014. It was confined to the investigation of the relationship between substance use and undergraduate students' (second year and third year) achievement in EFL reading comprehension test only. In other words, because of its specificity to EFL reading comprehension, the study does not focus on the participants' academic performance in general.

1.5. Limitations of the study

Like any other study, this study has some limitations. Firstly, it focused on one out of the then 31 public universities in Ethiopia. Moreover, it focused on only second and third year students. These make the scope of the study limited and make it difficult to generalize the findings to other universities which can have some context-specific characteristics. Secondly, whereas the effect of substance use on EFL reading comprehension achievement can be temporary, resulting in provisional relationship between the two variables, this study investigated the cumulative relationship between the dependent variable (reading comprehension achievement) and the independent variable (substance use).

2. Materials and Methods

2.1. Study area and study period

The study was conducted in Jimma University main campus from April 2014 – May 30, 2014. Jimma University is located at 352kms from Addis Ababa, the capital city of Ethiopia.

2.2 Research design

A descriptive survey study design was employed to determine the association between substance use and students' performance in EFL reading comprehension. No attempt was made to control variables. In other words, the researchers tried to see only the relationship between substance use and students' reading comprehension achievement.

2.3. Source population and study population

Regular undergraduate students of Jimma University who were learning in the main campus were considered the source of population for this study. Samples of second and third year regular undergraduates, the study population, were selected from four colleges: Public Health and Medical Sciences (CPHMS), Social Sciences and Law (CSSL), Natural Sciences (CNS), and Business and Economics (CBE).

2.4. Inclusion-exclusion criteria

Sampled students who were willing to participate were included in the study. On the other hand, students who were not willing to participate in the study and those who were under 18 years were excluded. Further, first year, fourth year, fifth year, sixth year, and Medicine students were excluded from the study for they were found reluctant to participate in the study, may be because of their academic burden. Students from the Department of English Language and Literature were excluded for they had participated in the pilot study. On top of that, students from the College of Agriculture and Veterinary Medicine as well as those from the Institute of Technology were excluded due to their distance from the main campus.

2.5. Sample size determination

In this study, sample size was determined using single population proportion formula with the assumption of confidence level of 95%, a design effect of 2, and 10 % allowance for non- response rate. Some basic assumptions of sample size determination are:

- P = Proportion of substance use among Jimma University students is not known; thus, 50% is taken to maximize the sample size.
- d^2 = an absolute precision (marginal error) 0.05 (5%)
- Non-response rate = 10%

The formula used to determine the sample size is:

$$n = \frac{(Z_{\alpha/2})^2 \cdot P(1-p)}{d^2}$$

$$d^2$$

$$Z_{\alpha/2} = 0.5 - \alpha/2$$

$$= 0.5 - 0.05/2$$

$$= 0.475$$

Then, using normal table area of 0.475 is covered by Z value of 1.96.

$$(Z_{\alpha/2})^2 = (1.96/0.05)^2$$

$$= 1536.64$$

$$\rightarrow n = 1536.64 \times 0.5 (1-0.5)$$

$$= \underline{384.16}$$

By adding 10% for non response rate and multiplying by design effect of 2, the required total sample size for the study will be

$$n = 384.16 + 38.416 = 423$$

$$= 423 \times 2 = 846$$

Total sample size = 846 students

2.6. Sampling technique

Multi-stage sampling technique was employed for this study. Samples of students in different departments of the four colleges of Jimma University were included in the study. There were 30 departments in the four colleges that admitted undergraduate students. Fifteen departments were selected by the lottery method and individual respondents were recruited from second year and third year students in different departments using stratified random sampling. The sampling procedure is summarized in the flow chart (see Figure 1 on page 290).

2.7. Study variables

In this study, the dependent (outcome) variable is reading comprehension achievement. On the other hand, the independent variable (predictor) is substance use. Substance use, as operationalized in the study, includes khat chewing, alcohol intake and cigarette smoking.

2.8. Data collection instrument

Two instruments of data collection were used in the study. Firstly, self-administered standardized questionnaire was used to collect substance use related data. The questionnaire consisted of items about habit, reason, length, type, and frequency of substance use among the study participants. This questionnaire also consisted of 12 socio-demographic questions. The participants were asked to circle the responses they believed were right. Out of 846 copies of the questionnaire distributed, 802 (94.8 %) were properly filled and returned. Additionally, standardized EFL reading comprehension test, which was adopted from TOFL test format, was administered.

2.9. Procedure of data collection

First, the instruments were piloted on third year English major students. Next, during the main (survey) study, the participants were told the purpose of the study. The investigators informed them that taking the standardized TOFL test would enable them to check their reading comprehension level. Following this, data were collected

using the questionnaire and the test (both in one booklet).

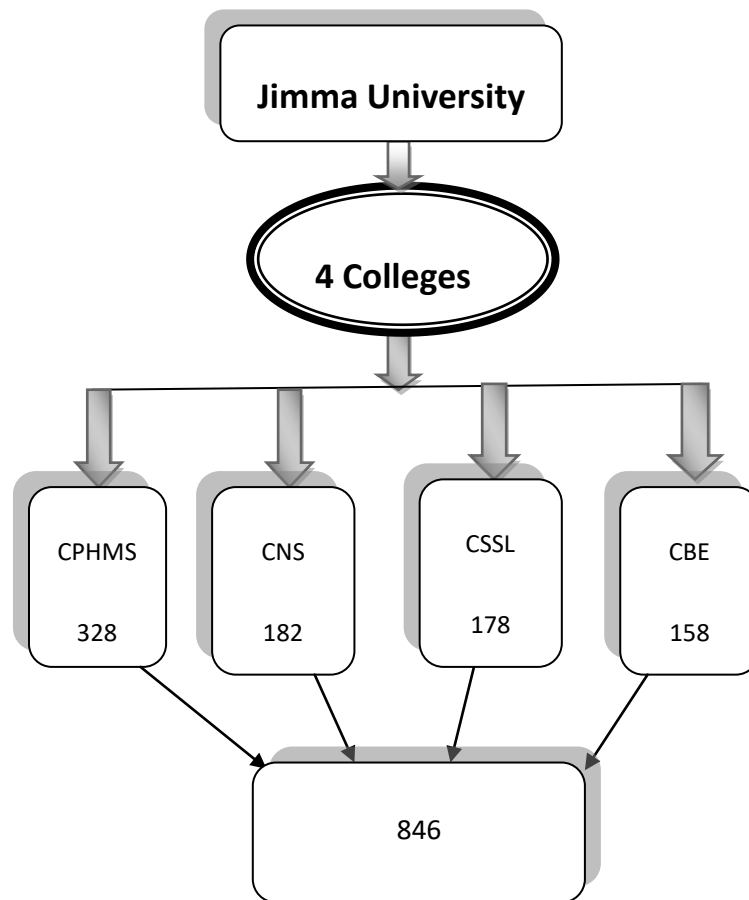


Figure 1:proportional allocation of student samples in different colleges

2.10. Data quality assurance

Data were collected by the principal investigator, one of the co-investigators and one English language instructor. Before administering the test, the data collectors discussed in detail on the contents of the questionnaire and the test, the general objective of the study and issues related to confidentiality. The reading test was marked by two high school English language instructors. Pilot study was done on 50 English major third year Jimma University students who were excluded from the main study. Comments and corrections given on the questionnaire were addressed properly. Data were carefully edited, coded and entered into a computer using Statistical Package for Social Sciences (SPSS) version 20.

2.11. Data analysis

A Kruskal-Wallis H test and The Mann Whitney U test were used to examine whether participants differed on their EFL reading comprehension score (at $P < 0.05$) because of their differences in habit, reason, type, and frequency of substance use.

These tests were used since the data distribution was not normal. Spearman's rank correlation was carried out to

measure the relationship between reading comprehension score and frequency of substance use. Median was used instead of mean since A Mann Whitney Test compares the former. Mean and standard deviation were given in the table to give only extra information as some literatures suggest.

2.12. Ethical considerations

Ethical clearance for the study was obtained from the Ethical Review Board of the College of Social Sciences and Law, Jimma University. Written consent was also obtained from the survey participants, and confidentiality was maintained.

2.12. Operational definitions

Cigarette smokers/khat chewers/alcohol drinkers: proportion of students who had ever smoked cigarette/chewed khat/ drunken alcohol respectively.

Current cigarette smokers/khat chewers/ alcohol drinkers: proportion of students who smoked cigarette/chewed khat/drank alcohol in the last 30 days preceding study time respectively.

Non-smoker/non-chewer/non-drinker: proportion of students who never smoked cigarette/chewed khat/drank alcohol respectively.

3. Results and Discussion

3.1. Results

As indicated earlier, this study aimed to investigate the association between substance use (khat chewing, alcohol in-take and cigarette smoking) and Jimma University undergraduates' reading comprehension achievement. Accordingly, to measure whether participants who had the habit of using substances (khat, alcohol, cigarettes) and those who did not have the habit of using these substances differed on the median score of standardized reading comprehension test, A Mann-Whitney U Test was applied (Tables 1-4).

The finding (Table 1, row 1) showed that the reading score for khat chewers was lower ($Mdn= 52.50$) than for non-chewing groups ($Mdn= 57.50$), and the difference is statistically significant, $U=28.81$; $Z= -3.64$; $p= .000$. Similarly, in the same table (row 3), the Test indicated that the score on standardized reading comprehension test was statistically significantly, but marginally, lower for drinking groups ($Mdn= 53.52$) than for non - drinking groups ($Mdn= 55.74$), $U=51262.00$; $Z=-1.89$; $p=.058$. The finding, therefore, revealed that khat chewing and alcohol intake significantly decreased the reading scores of the users when compared to the scores of the non-users.

Nevertheless, the test indicated that the smoking group ($Mdn= 55$) and the non-smoking group ($Mdn= 57.5$), row 2, did not differ on the reading score, $U= 10181.50$; $Z=-1.51$; $p=.131$. Thus, overall, it could be argued that the study participants who used substance (khat, alcohol and cigarette) did not improve reading score compared to their counterparts who did not use these substances.

Table 1: The relationship between substance use habit and reading score (out of 100%)

Variables	Categories	N	Mean	SD	Median	U ^a	Z	p
1.Habit of chewing khat	Yes	106	48.99	18.58	52.50	28.81	-3.64	.000
	No	696	56.18	16.46	57.50			
2.Habit of drinking alcohol	Yes	189	53.52	16.18	55.00	51262.00	-1.89	.058
	No	597	55.74	17.29	57.50			
3.Habit of smoking cigarette	Yes	32	50.70	19.17	55.00	10181.50	-1.51	.131
	No	755	55.44	16.86	57.50			

Table 2: The relationship between length of substance use and reading score (out of 100%)

Variables	Categories	N	Mean	SD	Median	U	Z	p			
Length of chewing khat	<6 Months	13	50.19	20.75	52.50	62.50	-.52	.608			
	6 Months to 1 Year	11	46.36	19.18	47.50						
	1 Year to 2 Years	23	42.50	18.83	40.00				399.00	-2.29	.022
	>2 Years	52	53.85	16.76	55.00						
Length of drinking alcohol	<6 Months	35	49.71	13.72	52.50	460.00	-.42	.678			
	6 Months to 1 Year	28	47.59	17.11	45.00						
	>2 Years	98	57.19	15.05	57.50				938.00	-2.60	.011
	1Years to 2 Years	20	48.50	18.79	46.25				720.00	-1.87	.062

^aU stands for Mann Whitney in Tables 1-4.

As the examinations revealed, the findings in Table 2, there is a statistically significant difference on reading score between participants who chewed khat from 1 year to 2 years ($Mdn= 40$) and beyond 2 years ($Mdn= 55$), $U=399.00$; $Z=-2.29$; $p=.022$. Similarly, as the Test revealed, the median of participants who drank alcohol between 6 months to 1 year is 45.00, while the median of participants who drank alcohol beyond 2 years is 57.50, and the difference is statistically significant, $U=938.00$; $Z=-2.60$; $p=.011$. A Kruskal-Wallis H test also showed that there is a statistically significant difference in standardized reading score among the four time lengths of drinking alcohol, $\chi^2(3) = 11.82$, $p = 0.008$. On the basis of these results, it could be concluded that participants who used khat or alcohol beyond 2 years achieved better reading score when compared to their counterparts who chewed khat between 1-2 years or drank alcohol between 6 months to 1 year.

Table 3: The relationship between starting time of substance use and reading score (out of 100%)

Variables	Categories	N	Mean	SD	Median	U	Z	p
Starting time of smoking cigarette	Before joining the University	14	46.43	20.14	42.50	72.50	-1.42	.155
	After joining the University	15	55.00	19.50	60.00			
Starting time of chewing khat	Before joining the University	60	52.17	19.05	56.25	745.00	-2.54	.011
	After joining the University	36	42.85	15.64	40.00			
Starting time of drinking alcohol	Before joining the University	140	53.54	15.89	55.00	2383.00	-.99	.325
	After joining the University	38	50.53	17.60	50.00			

As can be seen in Table 3, Mann Whitney U test was applied to compare the reading comprehension scores of students who used substance for long time and short time, and it indicated that participants who started chewing khat before joining the university scored better ($Mdn = 56.25$) than their counterparts who started chewing khat after joining the university ($Mdn= 40.00$), and the difference is statistically significant, $U=745.00$; $Z=-2.54$; $p=.011$. The finding supports the result found in Table 3 which revealed that longer time chewing of khat could positively influence reading score. However, for the two categories (Before joining university and After joining university) respectively, length of time of smoking ($Mdn=42.50$, $Mdn= 60.00$, $U= 72.50$; $Z= -1.42$, $p=.155$ and drinking ($Mdn=55$, $Mdn=50$, $U= 2383.00$, $Z= -.99$, $p= .325$) were not found to be factors that influence reading achievement score. On the basis of the result, it can be argued that those who chewed khat for longer time

scored better reading score as compared to those who chewed for shorter time.

Table 4: The relationship between reason for substance use and reading score (out of 100%)

Variables	Categories	N	Mean	SD	Median	U	Z	p
Reason for chewing khat	For pleasure	9	61.94	16.09	62.50	25.00	-1.37	.169
	For socialization	9	49.44	17.53	57.50			
	For better academic achievement	4	43.13	11.43	38.75	12.50	-.86	.389
	For comprehending reading materials	2	32.50	3.53	32.50	.50	-1.64	.100
Reason for drinking alcohol	For pleasure	20	63.38	10.36	62.50	114.00	-2.14	.032
	For socialization	19	55.66	13.33	52.50			
	For better academic achievement	2				.000	-2.28	.022
	For comprehending reading materials	0						

A Kruskal-Wallis H test was conducted to measure whether the research participants differ in standardized reading score because of reasons of using substance.

The test showed that there is a statistically significant difference in standardized reading score among the four categories of alcohol drinking reasons, $\chi^2(3) = 12.05, p = 0.007$. A Mann-Whitney test was also carried out to examine between which categories differences occur (Table 4). The test indicated that the median reading score was greater for participants who drank alcohol for pleasure ($Mdn = 62.500$) than for socialization ($Mdn = 52.50$), and the difference was statistically significant, $U = 114.00, Z = -2.14, p = .032$. The test further showed that students did not take alcohol for academic achievement in general (but only 2) and comprehending reading materials in particular (none).

These results revealed that participants who used substance (khat, alcohol, and cigarette) did not use it (them) assuming that using it (them) directly improve/s their academic performance in general and reading comprehension in particular.

Table 5: Relationship between reading score (out of 100%) and frequency of substance use

Variable	Mean	SD	1	2	3	4
1. Reading score out of 100	55.23	16.92	1	-.04	-.22	-.20**
			(N=802)	(n= 94)	(n=29)	(n= 189)
2. Frequency of chewing khat	2.84	1.36		1	.67**	.19
					(n=21)	(n=42)
3. Frequency of smoking cigarette	2.52	1.57			1	.47*
						(n=26)
4. Frequency of drinking alcohol	1.59	.88				1

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

To examine the extent to which reading score relates to the frequency of substance use, Spearman's rank correlation was carried out (Table 5). The examination indicated that there is a significant but reverse relationship between reading score out of 100 and frequency of drinking alcohol ($r_s = -.20$, $p = .006$). Thus, on the basis of this result, it is possible to argue that reading comprehension score significantly decreases as drinking alcohol frequency increases.

1.2. Discussion

This study revealed that khat chewing and alcohol intake significantly decreased the reading comprehension scores of the users compared to the scores of the non-users. It was also found that reading comprehension score significantly decreased as drinking frequency increased. Thus, it can be concluded that the study participants who used substance (khat, alcohol and cigarette) did not outperform those who did not use these substances in reading comprehension. This finding bears relationship with the finding of a study conducted in Jimma University to determine stress among medical students and its association with substance use and academic performance [13]. This study found that stress was significantly but negatively correlated with academic achievement. However, it should be noted that the two studies are different in that while the study on stress

focused on medical students' levels of stress and its association with substance use and academic performance, the current study identified the association between substance use and achievement in EFL reading comprehension.

Nevertheless, length of substance use was found significantly associated with achievement in reading comprehension test. It was thus found that participants who used khat or alcohol beyond 2 years achieved better reading scores compared to their counterparts who chewed khat between 1—2 years or drank alcohol between 6 months and 1 year. Therefore, the focus of research should not be only on the association between substance use and reading comprehension achievement, but how length of substance use associates with reading comprehension achievement should also be measured. This is because as the habit of substance use increases in duration, its physiological effects can alter with varying outcomes on the level of stress on the users. For example, if prolonged substance use can reduce stress (triggered by various factors), it can have some impact on the users' academic achievement in general and their reading comprehension achievement in particular; high level of stress has been proven to have a negative association with academic performance [13].

In this study, onset of substance use was also found to have association with achievement of reading comprehension test. The finding accordingly unveiled that participants who started chewing khat before they joined Jimma University registered significantly better scores than their counterparts who started using this substance after they joined the university. This finding also suggests that prolonged khat chewing could positively influence reading score. However, length of time of smoking and drinking were not found to be factors that significantly influence reading achievement score. An implication that can be drawn from this is that prolonged smoking and alcohol intake cannot improve academic achievement in general and reading comprehension ability in particular. In connection with this, a study found that heavy episodic drinking among undergraduates of the University of Gloucestershire, UK, had negative consequences on academic performance [17].

The finding of this study also indicated that reading score was greater for participants who drank alcohol for pleasure than for socialization. It was also found that students did not take alcohol to improve their academic achievement in general (but only 2) and to enhance their reading comprehension abilities (none). This finding corroborates with a study which found that the majority (n=, 364, 96.7%) poly-drug users in England took alcohol, cannabis, amphetamines, ecstasy, LSD and cocaine for relaxation [18].

4. Conclusion

The findings of this study revealed that substance use has some association with students' EFL reading comprehension achievement. While prolonged use of khat, onset substance use (before university enrolment vs. after university enrolment) significantly and positively associates with reading comprehension achievement, frequency of alcohol intake significantly but negatively relates with students' reading comprehension achievement. Therefore, it can be concluded that the association between substance use and reading comprehension achievement is not straightforward since various factors determine the relationship between the two variables. It can thus be inferred that substance use does not necessarily lead to efficiency and effectiveness

in reading comprehension work.

5. Recommendations

In line with the findings presented and the conclusions made accordingly, the following recommendations have been forwarded:

- It is necessary that instructors, the media and interventionists advise university undergraduates not to indulge in substance use with the mere view of improving their academic performance in general and their reading comprehension achievement in particular.
- Parents should also contribute their shares in endeavors to enable students to make informed decisions about substance use viz-a-viz academic performance of which reading comprehension achievement is a domain.
- Undergraduate students themselves need to weight the time they spend for substance use against the benefits they acquire from this behaviour.
- Finally, further studies are necessary to establish a clearer understanding of the association between substance use and EFL reading comprehension achievement.

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