

Common Co-morbidities among Students Using Alcohol in Mount Kenya University, Nairobi

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Abstract

Alcohol use has been reported to have serious health and social effects among University students. In order to ascertain this assertion, this study examined some of the common co morbidities that co-exist with alcohol use. The study was conducted among 126 undergraduate students at Mount Kenya University in Nairobi, Kenya. To select the sample, stratified purposeful sampling method was applied and respondents screened using a questionnaire, Beck Depression Inventory to screen for depression; Beck Anxiety Inventory for anxiety and an Alcohol Use Disorder Identification Test for alcohol use. The Intra-class correlation coefficient test (ICC) that measures the reliability for alcohol, depression and anxiety clusters found a high ICC ($p=0.0001$) which means that depression, anxiety and alcohol use are co-morbid.

Keywords: Common Co-morbidities, Alcohol, Mount Kenya University, Nairobi

I. Background to the study

Alcohol consumption has not only been described as a public health concern but also as a major cause of global suffering (Babor et al., 2010). In a review of epidemiological data on alcohol, Babor and others (2010) concluded that the substance is a great contributor to the burden of disease, disability and death. Together with the resultant serious health issues, the report further indicates that alcohol use results to social effects among the consumers. World Health Organization has recorded alcohol consumption as the world's third largest risk factor for disease and disability (WHO, 2014). Falk and others (2008) also reported that there were co-morbid disorders associated with alcohol use, which are highest between the ages of 18 and 24 years.

In a study on "Drinking to cope with depressive symptoms and ruminative thinking on students", Bravo, Pearson, and Henson (2017) found that alcohol misuse was a strong predictor of students' mental health issues. It was attributable to increased depressive symptoms, which led to students drinking to cope (Bravo et al., 2017). Other problems caused by alcohol use include

attempted suicide and other self-harm behaviours (Toprak, Cetin, Guven, Can, & Demircan, 2011) & Peltzer et al., 2016). Research by Neupane (2011) among patients with AUD in Nepal found that major depression was common. In a study in Nigeria, (Okeafor, Chukwujekwu, & Chukwuemeka, 2016) recorded a significantly high prevalence of AUD among people with high depressive symptoms. Another mental health issue found to be associated with increased risk and is a contributing factor to alcohol abuse is anxiety, which also leads to PTSD (Cheng, Cheng, Huang, & Chen, 2012). Individuals with symptoms of anxiety and depression have been found to use alcohol more than those without these symptoms. Similarly, other studies have indicated that individuals with anxiety, PTSD and depression have been found to use alcohol in a harmful way (Kedzior & Lader, 2015).

Furthermore, in Kenya, the effects of alcohol consumption are emerging as indicated by researchers (Ndegwa, Munene, & Oladipo, 2017). Their study found that increase in alcohol use is associated with increased symptoms of common mental disorders. Alcohol use is related to co-morbid mental disorders that include depression and anxiety. Agyapong, (2013) also found co-morbidity between AUD and depression among Kenyan college students. In addition, other researchers have expressed the need for more studies to provide interventions to prevent use and relevant co-morbidities, suggesting a relationship between addictions and other co-morbidities (Muriungi, Ndetel, Karanja, & Matheka, 2013). Therefore, depression, anxiety and post-traumatic stress disorder (PTSD), all of which could lead to alcohol use (Whitesell, Bachand, Peel, & Brown, 2013) are some of the common mental health issues associated with alcohol use record that, people who are heavy alcohol users present with high rates of major depressive disorder.

II. Methodology

The study was carried out in MKU, which have 11 campuses spread around the country with two campuses out of Kenya. In the various campuses, MKU has students at all levels namely Diploma, Undergraduate, Masters and PhD. The modes of study

also vary from regular, evening, school-based, virtual and weekend. The participants were drawn from the undergraduate students from the regular/day and evening modes of study in the Schools of Business, Education and Social Sciences. The two modes were selected because they are most appropriate, considering that school-based only come to campus during school holidays, weekend mode appear only on weekends and it's not possible to make contact with virtual students. The study was conducted at MKU's two campuses of Nakuru and Nairobi in Kenya. Nairobi campus is located in Nairobi city while Nakuru campus is located in Nakuru town in Nakuru County. Homogenous

purposive sampling was applied to select the campuses (Saunders, Lewis, & Thornhill, 2012) since they have similar characteristics and the students in both campuses use alcohol (Rimberere & Kabunga, 2017). The sample size of the study was determined using the following formula by Casagrande and others (1978) and a total of 125 participants was recruited. In this study, four assessment instruments were used for data collection. These are the Alcohol Use Disorders Identification Test (AUDIT), Beck's Anxiety Inventory (BAI), Beck's Depression Inventory (BDI) and a social-demographic questionnaire and data analysis was done using SPSS, version 23.

III. Results

TABLE 1

Variable	Total %	Participant's Scores on Anxiety at Baseline			Chi-Square Test		
		Low Anxiety	Moderate Anxiety	Severe Anxiety	Value	df	Sig.
Participant's Gender							
Male	60 (59.4)	49 (48.5)	7 (6.9)	4 (4.0)	2.728	1	.256
Female	41 (40.6)	30 (29.7)	4 (4.0)	7 (6.9)			
Participant's Age							
18-20	17 (16.8)	13 (12.9)	0 (0.0)	4 (4.0)	5.450	2	.244
21-23	57 (56.4)	44 (43.6)	8 (7.9)	5 (5.0)			
24-26	27 (26.7)	22 (21.8)	3 (3.0)	27 (26.7)			
Participant's Year of Study							
1 st Year	21 (20.6)	16 (15.7)	4 (3.9)	1 (1.0)	14.599	3	.024
2 nd Year	30 (29.4)	19 (18.6)	3 (2.9)	8 (7.8)			
3 rd Year	21 (20.6)	18 (17.6)	1 (1.0)	2 (2.0)			
4 th Year	30 (29.4)	27 (26.5)	3 (2.9)	0 (0.0)			
Participant's Mode of Study							
Regular/Day	93 (91.2)	73 (71.6)	10 (9.8)	10 (9.8)	.002	1	.999
Evening	9 (8.8)	7 (6.9)	1 (1.0)	1 (1.0)			
Participant's Marital Status							
Single but Dating	4 (4.2)	3 (3.2)	0 (0.0)	1 (1.1)	2.113	2	.715
Single but not dating	84 (88.4)	65 (68.4)	10 (10.5)	9 (9.5)			
Married	7 (7.4)	6 (6.3)	1 (1.1)	0 (0.0)			
Participant's Place of Residence							
On-campus Hostels	13 (14.1)	8 (8.7)	2 (2.2)	3 (3.3)	7.292	2	.121
Off-campus	33 (35.9)	30 (32.6)	0 (0.0)	3 (3.3)			
Living with family members	46 (50.0)	35 (38.0)	6 (6.5)	5 (5.4)			
Who Pays Participant's fees							
Parents/family members	82 (82.8)	65 (65.7)	7 (7.1)	10 (10.1)	5.314	2	.257
Scholarship	3 (3.0)	2 (2.0)	0 (0.0)	1 (1.0)			
Self-sponsored	14 (14.1)	11 (11.1)	3 (3.0)	0 (0.0)			
Marital Status of Participant's Parents							
Married	69 (69.7)	55 (55.6)	8 (8.1)	6 (6.1)	10.102	4	.258
Separated	4 (4.0)	4 (4.0)	0 (0.0)	0 (0.0)			
Single Parent	13 (13.1)	12 (12.1)	1 (1.0)	0 (0.0)			
Widow	11 (11.1)	7 (7.1)	1 (1.0)	3 (3.0)			
Widower	2 (2.0)	1 (1.0)	0 (0.0)	1 (1.0)			
Participant's Father's Occupation							
Professional	5 (5.8)	5 (5.8)	0 (0.0)	0 (0.0)	8.410	5	.589
Civil Servant	18 (20.9)	15 (17.4)	3 (3.5)	0 (0.0)			
Self-employed/Business	49 (57.0)	37 (43.0)	5 (5.8)	7 (8.1)			
Jobless	9 (10.5)	7 (8.1)	2 (2.3)	0 (0.0)			

Retiree	4 (4.7)	3 (3.5)	0 (0.0)	1 (1.2)			
Clergy	1 (1.2)	1 (1.2)	0 (0.0)	0 (0.0)			
Participant's Mother's Occupation							
Professional	1 (1.1)	1 (1.1)	0 (0.0)	0 (0.0)	6.604	4	.580
Civil Servant	19 (20.2)	18 (19.1)	1 (1.1)	0 (0.0)			
Self-employed/Business	65 (69.1)	49 (52.1)	8 (8.5)	8 (8.5)			
Jobless	8 (8.5)	6 (6.4)	0 (0.0)	2 (2.1)			
Clergy	1 (1.1)	1 (1.1)	0 (0.0)	0 (0.0)			

Table 1: Bivariate Analysis of Socio-Demographic Characteristics of Participant's Scores of Anxiety at Baseline

Table 1 presents the bivariate analysis of socio-demographic characteristics of participant's scores of anxiety at the baseline. The frequency of participant's gender and Beck Anxiety Inventory (BAI) implies that male participants scored at least moderate anxiety higher (6.9%) as opposed female participant (4.0%). The distribution of gender and anxiety scores were not significant ($p=0.256$). In the same way, participant aged 21-23 scored higher on moderate anxiety at 7.9% compared with participant aged 24-26 at 3.0% and none of participant aged 18-20 had moderate anxiety. The distribution of participant's age and scores on anxiety at baseline was insignificant ($p=0.244$).

The distribution of other socio-demographic characteristics and anxiety scores at baseline were insignificant ($P_s > 0.05$) as shown on the Table. However, in terms of respondents' year of study, the frequency of 1st year respondents' scores on at least moderate anxiety was higher (3.9%) compared with respondents who were in 2nd year (2.9%), 3rd year (1.0%) and 4th year (2.9%). However, chi-square test showed that there was a significant difference in the distribution of respondents' year of study and anxiety scores at baseline ($p=0.024$). This seems to imply that respondents' year of study as the only extraneous variable that plays a confounder's role in the distribution of respondents' socio-demographic characteristics and anxiety at the baseline.

TABLE 2

Variable	Total	Respondents' Scores on Depression at Baseline				Chi-Square Test		
		Minimal ups and down	Mild Depression	Moderate Depression	Severe Depression	Value	df	Sig.
Respondents' Gender								
Male	62 (60.2)	51 (49.5)	7 (6.8)	4 (3.9)	0 (0.0)	1.611	1	.657
Female	41 (39.8)	32 (31.1)	5 (4.9)	3 (2.9)	1 (1.0)			
Respondents' Age								
18-20	18 (17.5)	14 (13.6)	1 (1.0)	2 (1.9)	1 (1.0)	6.506	2	.369
21-23	58 (56.3)	46 (44.7)	8 (7.8)	4 (3.9)	0 (0.0)			
24-26	27 (26.2)	23 (22.3)	3 (2.9)	1 (1.0)	0 (0.0)			
Respondents Year of Study								
1 st Year	22 (21.2)	20 (19.2)	1 (1.0)	1 (1.0)	0 (0.0)	.778	3	.660
2 nd Year	31 (29.8)	22 (21.2)	4 (3.8)	4 (3.8)	1 (1.0)			
3 rd Year	21 (20.2)	17 (16.3)	3 (2.9)	1 (1.0)	0 (0.0)			
4 th Year	30 (28.8)	25 (24.0)	4 (2.8)	1 (1.0)	0 (0.0)			
Respondents Mode of Study								
Regular/Day	94 (90.4)	75 (72.1)	11 (10.6)	7 (6.7)	1 (1.0)	.990	1	.804
Evening	10 (9.6)	9 (8.7)	1 (1.0)	0 (0.0)	0 (0.0)			
Respondents Marital Status								
Single but Dating	4 (4.1)	4 (4.1)	0 (0.0)	0 (0.0)	0 (0.0)	2.827	2	.830
Single but not dating	86 (88.7)	68 (70.1)	12 (12.4)	5 (5.2)	1 (1.0)			
Married	7 (7.2)	7 (7.2)	0 (0.0)	0 (0.0)	0 (0.0)			
Respondents Place of Residence								
On-campus Hostels	14 (14.9)	12 (12.8)	0 (0.0)	2 (2.1)	0 (0.0)	8.322	2	.215
Off-campus	34 (36.2)	30 (31.9)	2 (2.1)	2 (2.1)	0 (0.0)			

Living with family members	46 (48.9)	34 (36.2)	9 (9.6)	2 (2.1)	1 (1.1)			
Who Pays Respondents' fees								
Parents/family	84 (83.2)	66 (65.3)	10 (9.9)	7 (6.9)	1 (1.0)	2.271	2	.893
Scholarship	3 (3.0)	3 (3.0)	0 (0.0)	0 (0.0)	0 (0.0)			
Self-sponsored	14 (13.9)	12 (11.9)	2 (2.0)	0 (0.0)	0 (0.0)			
Marital Status of Respondents' Parents								
Married	70 (69.3)	54 (53.5)	10 (9.9)	5 (5.0)	1 (1.0)	6.723	4	.875
Separated	4 (4.0)	4 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)			
Single Parent	14 (13.9)	13 (12.9)	0 (0.0)	1 (1.0)	0 (0.0)			
Widow	11 (10.9)	9 (8.9)	1 (1.0)	1 (1.0)	0 (0.0)			
Widower	2 (2.0)	1 (1.0)	1 (1.0)	0 (0.0)	0 (0.0)			
Respondents' Father's Occupation								
Professional	5 (5.7)	4 (4.6)	1 (1.1)	0 (0.0)	0 (0.0)	14.894	5	.459
Civil Servant	18 (20.7)	12 (13.8)	6 (6.9)	0 (0.0)	0 (0.0)			
Self-employed/Business	50 (57.5)	41 (47.1)	3 (3.4)	5 (5.7)	1 (1.1)			
Jobless	9 (10.3)	8 (9.2)	1 (1.1)	0 (0.0)	0 (0.0)			
Retiree	4 (4.6)	3 (3.4)	0 (0.0)	1 (1.1)	0 (0.0)			
Clergy	1 (1.1)	1 (1.1)	0 (0.0)	0 (0.0)	0 (0.0)			
Respondents' Mother's Occupation								
Professional	1 (1.0)	1 (1.0)	0 (0.0)	0 (0.0)	0 (0.0)	18.398	4	.104
Civil Servant	19 (19.8)	13 (13.5)	5 (5.2)	1 (1.0)	0 (0.0)			
Self-employed/Business	67 (69.8)	57 (59.4)	5 (5.2)	5 (5.2)	0 (0.0)			
Jobless	8 (8.3)	6 (6.3)	0 (0.0)	1 (1.0)	1 (1.0)			
Clergy	1 (1.0)	1 (1.0)	0 (0.0)	0 (0.0)	0 (0.0)			

Table 2: Bivariate analysis of socio-demographic characteristics of respondents' scores on depression at baseline

Table 2 presents the bivariate analysis of socio-demographic characteristics of respondents' scores on depression at the baseline. The frequency of respondents' gender and Beck Depression Inventory (BDI) implies that male respondents scored at least mild depression higher (6.8%) as opposed female respondents (4.9%). The chi-square analysis implies that there was no significant difference in the distribution of respondents' gender and scores on

depression at baseline ($p=0.657$). As regards respondents' age, respondents aged 21-23 scored higher on mild depression at 7.8% compared to respondents aged 24-26 at 2.9% and 18-20 at 1%. There was no significant difference in distribution of respondents' age and scores on depression at baseline ($p=0.369$). The distribution of other socio-demographic characteristics and scores on depression at baseline were insignificant ($P_s > 0.005$) as shown on the Table.

TABLE 3

Items	Mean	Std. Deviation	N
Respondents' scores on AUDIT at Baseline	1.4804	.82930	102
Respondents' scores on Depression at Baseline	1.2647	.61219	102
Respondents' scores on Anxiety at Baseline	1.3627	.74181	102

Table 3: Item statistics of respondents' scores on depression, anxiety and alcohol use at baseline

Table 3 shows the mean statistics of respondents' scores on alcohol, depression and anxiety at the baseline. The mean alcohol use among the

respondents was $1.4804 \pm$ (SD: .82930), the depression mean at baseline was $1.2647 \pm$ (SD: .61219) and that of anxiety mean was $1.3627 \pm$ (SD: .74181).

TABLE 4

ANOVA		Sum of Squares	df	Mean Square	F	Sig
Between People		81.271	101	.805		
Within People	Between Items	2.379	2	1.190	2.944	.055
	Residual	81.621	202	.404		
	Total	84.000	204	.412		
Total		165.271	305	.542		

Grand Mean = 1.3693

Table 4: Reliability analysis showing the consistency of correlation between alcohol use, depression and anxiety among the respondents

Table 4 attempts to show the reliability analysis where alcohol use, depression and anxiety scores at baseline were tested to see how consistent in correlation matrix. Null hypothesis was tested that there was no significant difference in means of between items (alcohol use, depression and anxiety) and

consistency of correlation. The Table indicated that the null hypothesis was rejected ($p = 0.055$). This implies that there was a significant difference in the mean between item statistics. This implies that alcohol use, depression and anxiety are statistically correlated.

TABLE 5

	Intra-class Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.248 ^a	.126	.378	1.991	01	02	.000
Average measures	.498 ^c	.302	.646	1.991	01	02	.000

Table 5: Intra-class Correlation Coefficient Test

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a. The estimator is the same, whether the interaction effect is present or not.
- b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.
- c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

Intraclass correlation coefficient test (ICC) measures the reliability of measurements for clusters. For instance; alcohol use, depression and anxiety data has been collected as groups and test if one operates as a single measure, will it always be in the same matrix with other items in the same group? Table 5 indicates a high ICC ($p = 0.0001$) which implies high similarity between values from the same group. This means that if a respondent is depressed or having anxiety, it is highly possible that such respondent drinks alcohol and vice versa.

IV. Discussion

The objective of this study sought to determine the common co-morbidities among university students using alcohol. As regards the common co-morbidities among students at MKU using alcohol, the study found that alcohol use disorder, depression and anxiety are statistically correlated as indicated by the high ICC ($p =$

0.0001). The Intra-class correlation coefficient test (ICC) that measures the reliability for alcohol, depression and anxiety clusters found a high ICC ($p=0.0001$) which means that depression, anxiety and alcohol use are co-morbid. The findings correlate with researches that have been done globally and a strong association between alcohol use disorders, mood and anxiety disorders has been recognized worldwide (Morley, et al., 20016).

For instance, a meta-analysis of epidemiological surveys from 1990 to 2014 reported a very high intra-class correlation coefficient test (ICC) where odds ratio of 2.42 for co-occurring AUD and major depression and an odds ratio of 2.11 for co-occurring AUD and any anxiety disorder was established (Lai, Cleary, Sitharthan, & Hunt, 2015). Similar studies also found a co-occurring strong correlation coefficients between illicit drug use disorder and major depression, followed by illicit drug use and any anxiety disorder, alcohol use disorders and major depression and alcohol use disorders and any anxiety disorder (Heckers, 2015; Kraemer, 2015).

Further, another research reported an increased propensity to drink in negative emotional situations and was associated with comorbid major depression and anxiety. However, it was noted to differ by sex and was

stronger in males compared with females (Karpyaki et al., 2016). Researchers have reported that anxiety is highly prevalent among all patients seeking addiction treatment. Notably for those with alcohol use disorders, the prevalence of anxiety disorders was found to be as high as 33% among patients with AUD. It was also noted that patients with AUD may consume alcohol due to its sedative effects as a way to self-medicate anxiety which they experience when they are not drinking (Nguyen, Mirbaba, Khaleghi, & Tsuang, 2017). At the same time, it was added that their anxiety may be a manifestation of an AUD manifested in the form of withdrawal symptoms. Regardless of the phenomenology, clinicians recognize a vicious cycle that has been established in those patients to the point where both the anxiety and AUD require intensive treatment to improve functioning (Nguyen et al., 2017).

In a front-line outpatient substance abuse clinic, the outpatients' who met the criteria for AUD and current GAD were 46%. The onset of GAD occurred prior to AUD in 67% of the comorbid cases, with an average time lag of 12.5 years among individuals with primary GAD. It was reported that participants with comorbid GAD-AUD manifested higher levels of worry-reduction alcohol expectancies, and 55.6% of comorbid participants had a history of suicide attempts. It was also noted that comorbid participants were more likely to show that worry interfered with their substance abuse treatment, indicating interest in concurrent treatment targeting their worry (Smith & Brook, 2010). Study findings provide initial evidence that GAD may be a prevalent and relevant factor among individuals with AUD seeking outpatient substance abuse treatment.

The report of another study among 5,877 AUD patients showed that social anxiety disorder (SAD) is highly comorbid with alcohol use disorder. However, it was noted that SAD was only related to alcohol dependence after controlling for relevant conditions and considering that SAD is linked to more severe alcohol impairment, this link is not well accounted for by other pathologies. The result of that study also showed that the onset of SAD predicted the onset of alcohol abuse, suggesting that SAD increases vulnerability for alcohol dependence. In fact, the result clearly indicated that SAD may serve as a risk factor for alcohol dependence (Buckner, Timpano, Zyolensky, Sachs-Ericsson, & Schmidt, 2008). Meanwhile, it has been reported in a study conducted in Australia that 39% of individuals with SAD and GAD also meet criteria for depression (Andersson, Magnusson, Carstensen, & Borgquist, 2011; Tiller, 2012). About 85% of patients with depression also experience significant symptoms of anxiety, while comorbid depression occurs in up to 90% of patients with anxiety disorders; and both anxiety and depression are reported

to be associated with substance and alcohol use disorder (Goncalves, Pachana, & Byrne, 2011).

V. Conclusion

This study examined the common comorbidities among students using alcohol in Mount Kenya University in Nairobi, Kenya. As regards the common co-morbidities among students at MKU using alcohol, the study found that alcohol use disorder, depression and anxiety are statistically correlated ($p=0.055$). The Intraclass correlation coefficient test (ICC) that measures the reliability for alcohol, depression and anxiety clusters found that a high ICC ($p=0.0001$) which means that depression, anxiety and alcohol use are co-morbid. Therefore, the results showed that both depression and anxiety are comorbid with alcohol use disorder.

VI. Recommendations

1. Stakeholders need to increase awareness of the serious effects of alcohol use and enlighten students on the need to be careful in the choice of drinking behavior. Serious and well organized campaigns need to be done on campus at stipulated times by the campus managers and also with invited professionals for students to understand the seriousness of such endeavors.
2. Students need to be psycho-educated on the risk factors for alcohol (as well as other drugs) use and be aware of mental health problems, which result from use such as depression and anxiety. This will help them to be careful on the decisions they make concerning substance use.
3. The university administration and counselors need to organize for therapy as a requirement in university, such that every student would be expected to go through specific hours of counseling with a therapist in the course of their studies. This will provide exposure on how to be able to handle some difficult life challenges.

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