ANTHROPOMETRIC INDICES AND ENERGY INTAKES OF ALCOHOLIC ADOLESCENT STUDENTS IN ABIA STATE UNIVERSITY

IBE, S.N.O.
Department Of Public Health Technology,
School of Health Technology, Federal University of Technology, Owerri.

ABSTRACT
The study assessed the nutritional status of alcoholics in relation to non-alcoholic adolescent students, as well as the relationship between alcohol consumption, and energy intake, and the anthropometric indices of the adolescent students of Abia state university. Anthropometric measurements (weight and height) of 513 adolescent students of both sexes aged 16-19 years were taken. The z-score values for anthropometric indices were calculated using National Centre of Health Statistics (NCHS) reference population. The food intakes of the subjects were obtained using 24-Hour recall method. Food models were used to identify the quantity of food consumed. The food composition table was used to calculate the energy value. T-Test and Chi-Square were used to test for differences. The results showed that the anthropometric indices were significantly lower in alcoholic than in non-alcoholics adolescent students in all the anthropometric indices (p < 0.05).Similarly, energy intakes of the adolescent student alcoholics were lower than the non-alcoholic students (p < 0.05; t - ratio = 2.842 for males, and -2.396 for females). The same trends were observed in the food frequency, consumption and health factors examined. There were significant but higher associations in alcoholics than non-alcoholic students between the height and weight indices, energy intakes, and level of alcohol consumption of the adolescent students. The Z-scores anthropometric indices as well as the energy intakes of the alcoholics were lower than the non-alcoholics and compared unfavorably with the reference standards. Excessive alcohol consumption could adversely affect nutritional status of adolescent students. Dangers in excessive alcohol consumption should be intensified through media and nutrition education especially in the university campuses.

Key words: anthropometric indices, energy intakes, alcoholic, adolescent students

INTRODUCTION

Alcohol, a drug of choice among youth; is usually consumed intensively by the youth, often consuming four to five glasses at one time. Many young people are experiencing the consequences of drinking too much, at too early an age, and as a result public to public health problem in the country.

Each year approximately 5,000 young people under the age of twenty-one die as a result of underage drinking, from motor accident, homicides, suicide as well as hundreds from other injuries such as fire burns and drowning. Yet, dinking continues to be widespread among youth and adolescents (Lemmens et al, 1992) Research, (Breslow and Smothers, (2005) have shown that many adolescents starts to drink at very young ages. In 2003, the average age of first use of alcohol was about 14, compared to about 17 ½ in 1965. People who reported starting to drink before the age of 15 were four times more likely to meeting the criteria for alcohol dependences at some point in their lives (Breslow and Smothers, 2005) In fact new research shows that the serious drinking problems (including what is called alcoholism) typically associated with middle age actually began to appear much earlier, driving adolescence and young adulthood. (Wester et al, 2004)

Alcohol consumption appears to increase metabolic rate significantly, thus causing more calories to be burned rather than stored in the body as fat (Alatola et al, 2008). Other

research has found consumption of sugar to decrease as consumption of alcohol increases (Shutz, 1995). The research results do not necessarily mean that people who wish to lose weight should continue to consume alcohol because consumption is known to enhance effect on appetite. In fact, excessive consumption of alcohol contributes significantly to four of the ten leading causes of death in North America, namely, heart failure, certain forms of cancer, cirrhosis of the liver and of the motor vehicle accidents (Alatola et al, 2008). Alcohol ingestion reduces use of fate by liver cells and promotes a positive energy balance, contributing to risk of obesity. Excessive alcohol consumption increases the risk of urination and dehydration (Suter, 2005).

The relationship between alcohol and weight remains unresolved and will remain so until more research is conducted that can clarify any apparent discrepancies in findings. This study is conducted to find out the effect of alcohol consumption on body weight and energy intake as a view of discouraging the adolescents from excessive consumption.

METHODOLOGY
The study was conducted in Abia State University, Uturu. A total of 513 adolescent students aged 16-19 years were purposefully selected for the study. A sub-sample of 253 were alcoholic adolescent students (138 males, 115 females), (who indicated taking one glass of alcohol at least everyday in the administered questionnaires) and 250 were non-alcoholics (147 males and 103 females).

A cross sectional anthropometric measurements of weight and height, were obtained from the adolescent students according to WHO (1976), using weight scale of accuracy of 0.1Kg and standiometer with accuracy of 0.1cm. The weight and height measurement were converted to anthropometric indices and Z-score values using National Centre for Health Statistics (NHCS, 1976) reference population.

Z-Score = Actual Child's Measurement – Median value of reference population
             Standard deviation value of reference population
The mean Z-Scores of the adolescent students were obtained.

The energy intakes of the adolescent students were obtained using 24-hour recall method. The students were asked to recall all the food eaten and drunk at the University Campus and outside on the previous day and the data was recorded. The food models were used to obtain the quantity of food consumed and food consumption table (Platt, 1975) was used to obtain the energy intake of the adolescent students, which was and compared with Recommended daily Intake (RDI), FAO /WHO /UN, (1985).

A structural questionnaire was used to collect information on food consumption pattern e.g. frequency of consumption, frequency of alcohol consumption, as well as data on health and socioeconomic factors of the adolescent students. Data collected were classified into groups and the percentage values for each sub-group obtained. Student –T- test was used to determine the significant differences between the mean values of the anthropometric indices; as well as the energy intakes of alcoholic and non-alcoholic adolescent students and by sexes. Chi-squared test was used to determine the association between alcohol consumption and anthropometric indices of the adolescent students, as well as their energy intakes, health and socioeconomic factors.

RESULTS AND DISCUSSION
Table 1 show that the mean z-scores anthropometric indices of the adolescent student alcoholics were lower than the adolescent students' non-alcoholics in all the anthropometric indices. The difference between the adolescent students alcoholics and non-alcoholics were

significant for both sexes but significantly higher in weight for height indices (t-ratio = -2.707males and -2.916 females, P < 0.01).

The lower Z-Score anthropometric indices in adolescent student alcoholics could be as a result of excessive consumption of alcohol. Westerterp, (1999) has shown that alcohol energy is not efficiently used in the body, but appears to increase metabolic rate significantly, thus causing more calories to be burnt rather than stored in the body as fat (Tremblay et al, 1995). Also alcohol intake replaces nutrient-rich food and directly interferes with the body's absorption, storage an use of nutrients in the body.

Table 2 shows that there is significant differences in the energy intake of adolescent alcoholics and non-alcoholics in both sexes (P < 0.05, t − ratio =-2.842 for males, -2.396 for females). However, the adolescent student alcoholics did not meet their recommended daily intake (2560 ± 603Kcal males, 1940 ± 711 Kcal females, as compared to RDA values of 2820 Kcal and 2150Kcal, respectively. The lower energy intake of adolescent student alcoholics than the non-alcoholics could be explained by more frequent intake of alcohol than actual food. When youth drink they tend to drink intensively, often consuming four to five drink /glasses at one time (Tolstrup, 2008). The frequent intake of alcohol must have replaced the chances of actual food consumption.

Although alcoholic drinks contain 7 calories per gram and most alcoholic drinks contain carbohydrates, research suggests that alcoholic energy is not efficiently used.
Besides, Schutz, (1995) has shown that there is decrease in consumption of sugar as consumption of alcohol increase. This could have also contributed to the lower energy intakes found in the adolescent student alcoholics than non-alcoholics. The food consumption pattern of the adolescent student (table 3) showed that smaller percentage (19.2%) of the adolescent alcoholics consumed at least 2 meals per day, 79.2% consumed alcoholic drinks more than three times daily, and 74.8% do not take snack in-between meals per day while the percentages for non-alcoholic students were 83.7%, 0% and 79.4%, respectively.

It is evident from the result above that there is a reduction in meals and snack intakes as alcohol consumption increases. This observation can only be possible after one hour of alcohol consumption; while within one hour of preload ingestion of alcohol a higher intake of food relative to energy-matched controls is possible (Poppit et al, 1996). This suggests that increases in the number of meals and snacks consumption among the adolescent student alcoholics can be achieved within one hour of preload ingestion of alcohol termed the short-term stimulatory effect. The time course also suggests that short-term stimulation of appetite may be mediated by the appetite control system, either through enhanced orosensory reward or impaired satiety. However it does not necessarily mean that people who wish to lose weight should continue to consume alcohol. The relationship between alcohol and body weight remains unresolved and will remain so until more research is conducted that will clarify any apparent discrepancies in findings.

The health status of the adolescent students (table 4) shows that higher percentage of the adolescent student alcoholics suffered from stomach pains (80.0%), sleep disturbance (45.6%), frequent urination (97.2%) and sickness in the last two weeks (51.2%) than in the adolescent student non-alcoholics, with percentage values of 32.8%, 31.2%, 23.3% and 14.2%, respectively. Alcoholism is the third leading cause of preventable death in the world. Excessive alcohol drinking increases the risk of infections, inflammation of the stomach lining, sleep disturbance (Klatsky, 1996). Also as alcohol reduces the action of anti diuretic hormone, it increases urination and the risk for dehydration (Holford, 1987). Despite the benefits of regular moderate alcohol use, the risks of abuse are more numerous and harmful.

There are significant associations between weight for height index, energy intake, frequency of consumption and sickness, as well as income expenditure and the level of alcohol consumption (table 6). The differences were lower in alcoholics than in non-alcoholic

students (P < 0.05). The above observations could be as a result of consuming food after the short-term stimulatory effect, which lowers the appetite and reduces the food intake. Although evidences of associations between alcohol intake and the above factors remain contentious, most recent results suggest that alcohol intake correlates with BMI (Breslow and Smothers, 2005), more diseases (Klastsky, 1996) and energy intake (Poppit et al, 1996). The relationships between alcohol consumption and the above mentioned factors are only dependent on the volume of drinking and independent of patterns of drinking.

CONCLUSION

Alcohol consumption affected the anthropometric indices and the energy intake of adolescent students. The health status as well as the socioeconomic factors of the adolescent students, were affected by the alcoholic consumption. Despite the benefit of the regular, moderate alcohol use, i.e. the short-term stimulatory effect, the risk of abuse are more numerous and harmful. It is therefore recommended that student alcoholics should be made to realize the advantages of short-term stimulatory effects on the food intake and the importance to redundancy alcohol consumption through adequate campaign against alcoholism.

Acknowledgements

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Table 1: Mean Z-Score anthropometric indices of alcoholic and non-alcoholic adolescent students.

Anthropometric Indices	Alcoholics			Non-alcoholics		
	n	Z-Scores	SD	n	Z-Scores	SD
a. Weight for Age						
Males	147	-2.74	1.93	138	-1.29	1.07
Females	103	-2.51	1.74	115	-0.93	1.03
b. Weight for Height						
Males	147	-2.97	1.96	138	-0.55	1.04
Females	103	-2.73	1.57	115	-0.32	1.01
c. Height for Age						
Males	147	-1.79	1.59	138	-1.65	1.49
Females	103	-1.94	1.83	115	-0.96	1.05

a. $P < 0.05$; t- ratio = -2.317 (males), -2.637 (females)
b. $P < 0.05$; t- ratio = -2.707 (males), -2.916 (females)
c. $P < 0.05$; t- ratio = -2.013 (males), -2.241 (females)

Table 2: Mean energy intake of the adolescent students by group and sex, compared with recommended daily intake (RDI)

	Energy Intake (KCal)					
	Male			Female		
Group	n	x	SD	n	x	SD
a. Alcoholics	147	2560	603	103	1940	711
b. Non-alcoholics	138	2910	566	115	2245	645
Recommended Daily Intake	(2820)			(2150)		

Values in parenthesis are recommended daily requirement standard.
a. $P < 0.05$; t- ratio = -2.842 for males
b. $P < 0.05$; t- ratio = -2.396 for females

Table 3: Food consumption pattern of the adolescent students by study group

Food Consumption Factors	Study Group			
	Alcoholics		Non-alcoholics	
a. Have you had at least 2 meals per day	n	%	n	%
Yes	48	19.2	212	83.7
No	202	80.8	41	16.2
b. Frequency of alcohol consumption per day				
less than or equal to one	52	20.8	253	100.0
More than one	198	79.2	-	-
c. Taking of snacks in between meals				
Yes	66	26.4	201	79.4
No	187	74.8	52	20.5

Table 4: Health status of adolescent students by study group

Health Factors	Study Group			
	Alcoholics		Non-alcoholics	
a) Stomach pain	n	%	n	%
Yes	210	84.0	83	32.8
No	40	26.0	170	67.2
b) Sleep disturbance				
Yes	136	55.4	79	31.2
No	114	45.6	174	68.8
c) Frequent urination				
Yes	243	97.2	59	23.3
No	10	3.8	194	76.7
d) Sickness in the last two weeks				
Yes	128	51.2	36	14.2
No	122	49.8	217	85.8

Table 5: Association between adolescent factors and alcohol consumption

	Alcoholics		Non-alcoholics	
	n	**%**	**n**	**%**
1. Energy Intake (KCal)				
Above RDI	83	33.2	193	73.3
Below RDI	167	66.8	70	70.0
2. Weight for Height Index				
Above -25D	96	38.4	170	64.6
Below -25D	154	61.6	93	35.3
3. Food Frequency Consumption				
Three times	96	38.4	173	65.7
Less than three times	154	61.6	90	34.2
4. Frequency of Sickness forth nightly				
Above average	151	60.0	97	36.8
Average or less	99	40.0	166	63.1
5. Income expenditure per day (N900)				
Above average	165	66.0	122	46.3
Below 900	85	44.0	141	53.6

Average frequency of sickness = 2 times
Average income expenditure   = 900
1. $X^2 = 3.943$; $P < 0.05$; $df = 1$
2. $X^2 = 4.201$; $P < 0.05$; $df = 1$
3. $X^2 = 5.93$; $P < 0.05$; $df = 1$
4. $X^2 = 3.79$; $P < 0.05$; $df = 1$
5. $X^2 = 3.391$; $P < 0.05$; $df = 1$