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Relationship between Alcohol Consumption and Educational Attainment

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Abstract - *Alcohol consumption is a social concern and has always been an evergreen topic of study. Earlier, studies have been done on the relation of socioeconomic status and alcohol consumption indicating that lifetime income patterns may have an indirect association with alcohol use, mediated through current socioeconomic positions. The thesis of this paper further explores the association of amount of alcohol consumption with highest educational qualification of an individual mediated through income categories. In this paper, statistical analysis tools and regression model have been used to test the hypothesis. At the end of the paper, it is shown that the amount of alcohol consumption has a significant association with the highest grade of education. In other words, the amount of alcohol consumption is highest for the category of people whose highest qualification is primary schooling wherein the income category of the individual doesn't moderate this relationship.*

Key Words: **Alcohol consumption, educational qualification, income, statistical analysis tools, regression model**

1. INTRODUCTION

Alcohol use is thought to have a significant impact on society. They're often consumed in specific social situations and can even be used in religious ceremonies. Apart from that, the rate of alcohol consumption will reveal a wealth of information about the causes of alcoholism. The physical origins of alcoholism have been traced back to a network in the human brain that controls our reaction to risk. Every year, 3 million people die around the world as a result of harmful alcohol use, accounting for 5.3 percent of all deaths. Alcohol-related deaths account for 7.7% of all global deaths among men and 2.6 percent of all deaths among women. Total alcohol per capita consumption in 2010 among male and female drinkers worldwide was on average 19.4 litres for males and 7.0 litres of pure alcohol for females.

The differences in alcohol consumption among different groups can be attributed to a number of factors. According to studies, schooling and income are two major factors that influence drinking habits in various ways. Less trained men are more likely to partake in risky drinking, and men with higher income consume more alcohol and more often than those who are less wealthy. [1-3]. Even though health and education, both are the centre of socioeconomic status(SES), education should be the key component to SES, because education makes people well aware of the better choices and their outcomes on their lives[4]. In the U.S., the proportion of current drinkers increases with education and income[5], with some research reporting a U-shaped relationship between income and average daily alcohol consumption[6].

Lower educational attainment (high school or less) was significantly associated with increased risks of both non-problematic heavy drinking and problem drinking, according to a population study conducted in Japan. As compared to the highest income tertile, lower income (lowest tertile) was associated with a lower risk of non-problematic heavy drinking (OR, 0.66; 95 percent CI, 0.43–1.00), but not of problem drinking (OR, 0.80; 95 percent CI, 0.50–1.30)[7]. In a study focusing on the Danish population, however, components of SES were not found to be significantly associated with risky single occasion drinking (RSOD) separately or in combination.

The current paper's aim is to answer the following questions: (a) Is educational qualification associated with binge drinking and heavy drinking use among US communities? (b) Does the income category moderate the association between educational qualification and binge drinking? This will be studied by Statistical analytic tools and suitable model to test the findings.

2. METHODS

2.1 Study Population

The data comes from the first wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), the country's biggest longitudinal study of alcohol and substance usage, as well as psychological and medical comorbidities. Participants (N=43,093) comprised the civilian, non-institutionalized adult population of the United States, which included people living in their own homes, military personnel living off base, and people living in boarding or rooming houses, non-transient hotels and motels, shelters, facilities for housing staff, college quarters, and group homes. This way people from diverse backgrounds and income levels, as well as those who have completed various levels of schooling can be investigated.

The NESARC surveyed a large number of Blacks, Hispanics, and young adults aged 18 and up. Participants over the age of 18 who had consumed alcohol at least twice in the

previous 12 months made up the data analytic sample for this analysis.

2.2 Procedure and Methods

Data were collected by trained U.S. Census Bureau Field Representatives during 2001– 2002 through computer-assisted personal interviews (CAPI). One adult was selected for interview in each household, and interviews were conducted in respondents' homes following informed consent procedures.

The data of adults of age greater than 18 years has been taken for the statistical analysis. The highest grade of education of each individual(categorical variable) along with the income category(categorical variable) has been considered. The amount of alcohol intake ("About how often did you usually smoke in the past year?") and the rate of intake(" On the days that you smoked in the last year, about how many cigarettes did you usually smoke? ") has also been considered to find the average toxic level per person(quantitative variable) to find the variations in amount and rate of alcohol consumption in various income groups and its association with their maximum level of education.

2.3 Alcohol Drinking Patterns

The frequency of alcohol consumption or how often alcohol was consumed in the past year was classified into the following ten categories: every day, nearly every day, 3-4 times a week, two times a week, once a week, 2-3 times a month, ones a month, 7-11 times in last year, 3-6 times in last year and 1-2 times in last year. Each category was converted into number of days alcohol was consumed in a year. Then the amount of alcohol consumed each time was classified in the same manner i.e. classified into ten categories.

Based on the number of times alcohol was consumed in a year and the amount of alcohol consumed each time, another quantitative variable was introduced as toxic level. The toxic level was calculated for each category by multiplying both the previous quantitative variables.

2.4 Education

The highest grade of education was classified into 14 categories the first one being no schooling at all and the fourteenth being completed master's degree or above. For analysis purpose, these categories were grouped into total four categories- G1(no schooling to completed grade 1 or 2), G2(between grade 3 and grade 8), G3(between high school and graduation completion degree), G4(between college and master's or equivalent degree).

2.5 Income

The total income of all individuals in last 12 months was taken into consideration. All the seventeen categories starting from no personal income to $100,000 or more were grouped into three divisions: lower income group, middle income group and higher income group.

2.6 Statistical Analysis

For data analysis, ANOVA(Analysis of Variance) was used to find the p value, and check for a significant association between alcohol consumption(both rate and amount) and highest grade of education. Based on the significance, the most suitable regression model is tested on the data. In this case, Multiple Linear Regression is best suited since the relationship is expected to be linear. The multiple linear regression model was fitted in the sample with highest grade of education as the independent variable, toxic level(obtained by multiplying number of days alcohol was consumed and amount of alcohol consumed every time) as the dependent variable and income category as a moderator. This gives a third variable which becomes the dependent variable.

3. RESULTS

The study enrolled all individuals of 18 years or above. This included income category(n=15,527), middle income category(15,549) and high income category(12,017). The independent variables were the four groups based on the highest level of education completed. On comparing with the toxic level, it was visualized that the toxic level was highest in G1 and least in G4. Then, to test for any significance between our independent and dependent model, statistical data analysis was performed.

Initially, ANOVA test was performed to check for a significant association between the level of education and toxic level. Fig 1 shows the results of ANOVA test

OLS Regression Results

Dep. Variable:	Toxic_Lvl	R-squared:	0.004
Model:	OLS	Adj. R-squared:	0.004
Method:	Least Squares	F-statistic:	33.23
Date:	Sat, 24 Oct 2020	Prob (F-statistic):	1.98e-21
Time:	18:23:01	Log-Likelihood:	-2.0932e+05
No. Observations:	26642	AIC:	4.186e+05
Df Residuals:	26638	BIC:	4.187e+05
Df Model:	3		
Covariance Type:	nonrobust		

Fig.1

performed on the dependent variable. Here, p value is 1.98e-21 i.e. $p<0.05$, indicating that there is a relationship between the highest level of education and amount of alcohol consumption. But the relationship was unclear, and also, the moderators affecting this relationship was unknown. To get a clear relationship between our variables, we performed regression Analysis

To find the type of association between dependent variable and education level with the income category as a moderator, multiple linear regression was performed.

Table 1 shows the descriptive statistics(mean and standard deviation) of each group based on their income category. In each income category, individuals with minimum schooling were highest in number.

Table 2 shows the p values in each income category. All values depict that there is significant association in each category with upper income category having more prominent significance as compared to other two categories.

Table 3 to 5 shows the regression model of association between highest grade of education and the dependent variable in different income categories.

Table 1: Descriptive Statistics

	Lower Income		Middle Income		Higher Income	
	Mean	SD	Mean	SD	Mean	SD
Education						
G1	313.57	985.92	304.90	629.40	352.35	589.91
G2	280.32	627.33	292.69	602.66	291.54	500.04
G3	244.01	598.73	261.76	664.82	244.59	439.47
G4	220.01	597.45	217.84	414.36	225.89	347.17

Table 2: OLS Model[Least Squared]

Income	Number of observations	Df Residuals	p
Lower	7573	7569	0.0063
Middle	9928	9924	1.48e-06
Upper	9141	9137	8.04e-23

Table 3: Regression model of association between highest grade and alcohol consumption for low income group

	coeff	std. err	t	p>|t|	[0.025 0.975]
Intercept	313.56	13.32	23.55	0.000	287.46 339.67
G2	-33.25	22.1	-1.5	0.13	-76.58 10.08
G3	-69.55	37.531	-1.853	0.064	-143.127 4.017
G4	-93.56	29.070	-3.218	0.001	-150.545 -36.57

4. DISCUSSION

The association of alcohol consumption with education was examined with income category as a moderator. Individuals with only primary schooling were highly associated with risky rates of alcohol consumption and this association was most significant in the upper income category, and least significant in the lower income category.

Lower education was significantly associated with increased rates of alcohol drinking; this result was consistent with previous findings [8, 10]. Education conveys facts and health-related knowledge which in turn raises cognitive skills that affect health-promoting and betterment
decisions[11, 12]. Hence, proper education may increase awareness among individuals about the negative effects of heavy drinking and may build individual's resistance towards drinking by stopping or reducing the consumption[13, 14].

Education also shapes cultural capital[15] in the form of health-related values and norms[16]. Because alcohol drinking is influenced by cultural norms that are relatively straightforward [8], unequal distribution of cultural capital across educational

levels may result in differences in alcohol drinking patterns. Those with higher education adopt health promoting behaviors and relate with others with higher education, their social networks communicate health-promoting behaviors and widen education-related inequalities [3, 12]. Drinking patterns can therefore cement education-related inequalities in heavy drinking. It was discovered that having a high income was linked to a higher risk of non-problematic heavy drinking. The evidence on the links between income and drinking habits is mixed; some research found that heavy drinking was more common among those with higher

Table 4: Regression model of association between highest grade and alcohol consumption for middle income group

	coeff	std. err	t	p>|t|	[0.025 0.975]
Intercept	304.903	9.075	33.59	0.000	287.115 322.69
G2	-12.2175	14.378	-0.850	0.395	-40.401 15.966
G3	-43.1406	20.531	-2.101	0.036	-83.385 -2.897
G4	-87.0618	16.566	-5.256	0.000	-119.534 -54.58

Table 5: Regression model association between highest grade and alcohol consumption for high income group

	coeff	std. err	t	p>|t|	[0.025 0.975]
Intercept	352.3578	11.128	31.664	0.000	330.544 374.17
G2	-60.8168	14.914	-4.078	0.000	-90.052 -31.58
G3	-107.7594	17.931	-6.010	0.000	-142.908 -72.61
G4	-126.4615	12.907	-9.798	0.000	-151.763 -101.6

*For all tables, p<=0.05; coeff= coefficient; std.err=standard error

income [18], while others found that higher income was linked to a higher level of light drinking[13,19]. One potential reason for the current study's findings that higher income is linked to a higher risk of non-problematic heavy drinking is that people with higher income have more discretionary income with which to buy alcohol [20]. Another reason might be that, unlike smoking, which is widely considered to be socially unacceptable, drinking is often an integral part of social life, especially in higher-paying workplaces and social networking parties. Drinking is a popular social activity in the United States, especially among middle-aged men; individual drinking habits can indicate the availability of social drinking opportunities [21].

The consequences of these results for alcohol policy are important. According to the findings, people with a lower level of education are more likely to report both non-problematic and problem drinking. Despite the fact that the number of people who reported these habits was small, they may have a significant effect on the social distribution of disease burden and health-care use.

This paper has certain limitations. First, we focused on self-reported alcohol intake, as in most large-scale studies. Correction of self-reporting bias, on the other hand, resulted in only a minor shift in the direction and magnitude of education-related differences in heavy drinking among Americans [17]. It was just taken by manipulating the data available(no alteration in the data has been done). Second, the data was not categorized according to other factors such as gender, community, ethnicity, or religion. We have distributed the entire sample in an equal manner. Third, no data is considered based on the mental stability of the individuals. Whether they have conditions like depression or trauma or any other mental disorder, is not tested in this analysis. But the mental health tends to mark an effect on heavy drinking adults and need to be examined in further studies. Fourth, when we looked at current drinking rather than drinking past, we couldn't tell the difference between lifelong abstainers and former drinkers, which might skew the results if former drinkers were those who quit due to illness.

Overall, the findings in this paper suggest the association between education level and drinking among adults in the U.S. Further research is needed to better

understand the mechanisms behind race and ethnic differences in behavioral correlates of other socio-economic factors.

5. CONCLUSION

The amount of alcohol consumed has a significant relationship with the highest grade of education, according to the paper's conclusion. In other words, the amount of alcohol consumed is highest in the group of people with a primary school education, and the individual's income level has little bearing on this relationship. Individuals with only a primary education were strongly linked to high rates of risky alcohol use, with this connection being strongest in the upper income bracket and weakest in the lower income bracket.

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