IMPACT OF ALCOHOL CONSUMPTION ON HEALTH: EVIDENCE FROM RURAL TAMIL NADU, INDIA

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ABSTRACT

Alcohol is one of the causes of morbidity and mortality around the world. As consumption increases over time, it becomes necessary to investigate the impact of alcohol consumption on health among rural people. Therefore, this paper examines the health impact of alcohol consumption on rural population in Cuddalore District of Tamil Nadu, India. A short cross-sectional study was designed to collect data from four villages in the district. A simple random sampling methodology was adopted to collect data from 271 participants using interview schedule. Percentages and ordered probit regression were used to analyze the data. The results showed that alcohol consumption deteriorated health status within the sample while education was related to better health. Age, income, and tobacco use were not significant in affecting health status. Policy should therefore aim at raising educational levels with adequate health education and highly control the sale of alcohol so as to reduce consumption.

Keywords: alcohol consumption, health behavior, deaths, tobacco, health status.

Introduction

Good health is a determinant of economic growth and a key component of the well-being of the population in all countries. Consequently, factors that deteriorate human health have attracted serious attention. In his human capital model, Grossman (1972) argued that the individual chooses his own length of life on earth. Thus, the number of years that an individual lives on earth depends on his own lifestyle choices. In this regard, health behaviors such as alcohol and tobacco consumption, illicit drugs, physical activity \textit{inter alia} may have influence on the individual’s health.

Alcohol is one of the commodities with many consumers worldwide. According to estimates from the WHO, the worldwide consumers of alcohol stand around 2 billion people (WHO, 2004). In much of economic theory, individuals consume commodities due to the utility that such commodities yield. However, such commodities may or may not impact negatively on their health. Some studies have shown that alcohol consumption is one of the leading causes of a wide range of health problems such as chronic diseases (e.g., liver damage, stroke, cancer of the mouth and esophagus). Indeed, Rehm, et al. (2010) and WHO (2009) have reported that alcohol
is responsible for approximately 20% of deaths resulting from motor vehicle accidents, 30% of cancer related mortality (e.g., esophageal cancer and liver cancer), epilepsy, and homicide, and 50% of liver cirrhosis related mortality.

Further, studies by Lucey, et al. (2009) and O’Shea, et al. (2009; 2010) have also confirmed the harmful effects of alcohol on human health. Specifically, they argue that one of alcohol’s principal actions is causing damage to the liver, the primary organ for metabolism while damaging other organs of the human system. As a result, about 90 percent of heavy drinkers (i.e., those drinking 60 g or more of alcohol per day)—and even some who drink less—develop fatty liver (i.e., steatosis) and about 30 percent of people who regularly consume large amounts of alcohol have a significantly increased risk for developing Alcohol Liver Disease. Similarly, recent report from the WHO posits that about 3.3 million global deaths in 2012 were attributable to alcohol. These figures show that alcohol consumption is one of the unhealthy behaviors of the individual.

Thus, the consumption of alcohol has negative impact on human health. Nonetheless, the scope and variety of these health problems are attributable to, among other factors, differences in the amount, duration, and patterns of alcohol consumption; and differences in genetic vulnerability to particular alcohol-related consequences.

In India, alcohol consumption is not new as it has been in existence over centuries, and its usage has passed through several changes in the last few decades (Saxena, n.d). In fact, the trend in alcohol consumption among the population continues to rise throughout India. While some states such as Nagaland, Gujarat, and Manipur have managed to ban the sale and consumption of alcohol, other states such as Tamil Nadu and Pondicherry continue to generate more revenue from the sale of alcohol. For example, in the Union Territory of Pondicherry, both public and private bodies are engaged in the sale whereas in a neighboring state of Tamil Nadu, government is the sole distributor and/or seller of alcohol drinks since 2003. The Government of Tamil Nadu sells alcohol via Tamil Nadu State Marketing Corporation Limited (TASMAC), and licensed pubs. Though the Tamil Nadu Prohibition Act, 1937 requires alcohol consumers to be at least 21 years, most drinkers are found to be below this age.

The rising pattern of alcohol consumption among both urban and rural population has implications on the society in terms of public health. Like Rhem, et al. (2010), WHO (2009), earlier studies such as Anderson, et al. (1993), and Edwards et al. (1994) found that long term heavy drinking is associated with an increased risk of a wide variety of conditions including raised blood pressure, liver cirrhosis, some cardiovascular diseases, and cancers of the mouth, pharynx and oesophagus. Cook and Moore (2000) also report similar harmful effects of alcohol on health. Studies on India are not different in this regard. Indeed, high prevalence of liver and cardiovascular diseases among heavy drinkers and among those who consume country liquor compared with other types of alcohol has been reported (Narawane et al., 1998; Shankar et al., 1986; Sharma et al., 2013).

It is well recognized in health economics literature that several factors do affect the health status of an individual. Such factors as income, education, age, environmental factors (e.g. sanitation and water) as well as healthcare utilization are important in determining health status. As noted by Grossman (1972), education may improve health by enhancing allocative efficiency (i.e., participation in healthier behaviors) or productive efficiency (i.e., obtaining more health from the same set of inputs). In addition, Auster, et al. (1972) argued that income may have both negative and positive impact on health due to changes in lifestyle choices resulting from increased income. Grossman and Kaestner (1997) have confirmed, from their literature review, that education is more important correlate of good health for both individuals and groups than with occupation or income.

Statement of the Problem
The harmful effects of alcohol are enormous and are not limited to the individual but also the society in which he lives. It presents health, social and economic problems to the entire society, urban and rural alike. Alcohol, as noted by WHO (2014), is one of the major causes of death across the globe. For instance, it
accounted for about 5.9% of global deaths in 2012, and the trend in consumption is rising with more youth engaged in the act. In most cases, heavy drinkers are found in rural communities and ghettos in urban centers. While there is copious literature on the health impact of alcohol in developed countries, few studies exist in most developing countries such as India. Even with that, the literature is mostly skewed towards urban population. It is for this reason that the present study focuses on the health impact of alcohol consumption on rural dwellers. Thus, the aim of this study is to investigate the health impact of alcohol on rural dwellers.

**Objectives of the study**

The main objective of this study is to investigate the impact of alcohol consumption on consumer’s health. The specific objectives are to:

1. Find the state of health of alcohol drinkers.
2. Find the impact of alcohol use on self-reported health status of consumers.
3. Find other factors affecting the health status of respondents.
4. To find the prevalence of tobacco use among alcohol consumers.

**Materials and methods**

The present study was conducted in four villages in Cuddalore District of Tamil Nadu. It was a cross-sectional study undertaken to find out the effect of alcohol consumption on consumers. The reason for the choice of these villages stems from the backward nature; and the increasing trend of alcohol consumption among the male population is based on the researcher’s observation. Female population was not included in the study as most of the females in Indian social built-up are reluctant to talk on such sensitive issues which may bear consequence in their personnel lives in their vicinities.

The villages were selected through simple random sampling method. Self-prepared interview schedules were used to collect information from 271 participants. The entire population of alcohol consumers is unknown in these villages. That is, the researcher did not have any information regarding the number of all male consumers of alcohol in the respective villages. Given that the entire male alcohol consuming population is unknown, there was no scientific basis to determine the sample size. As a result, the sample size of 271 was determined based on the researcher’s resources, i.e., monetary and non-monetary resources. That is due to financial and time constraints.

Preliminary information was collected from a responsible adult (being aware of all family details) of the household. All data of individuals relating to the frequency of drinking, cost of drinking, and other consumption related questions were asked for the past 30 days, as this was easier to recall from memory. Health status was measured using respondent self-report health. Thus, respondents were asked to rate their current health status on a scale, i.e., poor, fair, and good. Descriptive as well as quantitative method, i.e., ordered probit regression, was used to analyze the data. Data processing and analysis was carried out with the aid of STATA 11.0 econometric package.

**Ordered probit model for Health Status**

The present study made use of ordered probit regression to estimate the effect of alcohol use on health status. The operational model for health status in the present study is given as:

\[ HS = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + e \]

\[ HS = \text{self-reported Health Status of the respondent} \]
$X_1$ = monthly household income of the respondent

$X_2$ = age of the respondent

$X_3$ = education level of the respondents

$X_4$ = monthly alcohol expenditure

$X_5$ = tobacco consumption of the respondent

Where $HS$ is the dependent measure, $\beta_s$ are the parameters to be estimated and $e$ is the error term. Qualitative variables such as education and tobacco use enter the regression equation in the form of indicator variables taking the values of 0 and 1 accordingly while HS was coded as 1, 2, and 3 for poor, fair, and good health respectively.

**Results and Discussion**

**Data Description**

In this section, the results of the study are presented and discussed. A total of 271 respondents were interviewed using schedules. These were male consumers of alcohol in the four villages. Out of 271 respondents, 130 (47.97 percent) were aged between 15 and 35 years. A total of 125 (46.12 percent) of the consumers were in 36-55 age group while 16 people were above 55 years. This aged group represented 5.9% of the total sample. The results suggest that prevalence of alcohol consumption is high among the youth in the study area. With regard to educational level, 75.65% of the respondents are school leavers whereas 11.44% were college graduates. Illiterates constituted 12.92% of the sample population. Thus, few people in the communities lack formal education. The high percentage of educated people drinking alcohol suggests that one’s educational qualification does not reduce his drinking pattern.

Again, the results also show that 175 of the respondents were married at the time of the study, and this constituted 64.58% of the sample. Table 1 below depicts the socio-economic characteristics, health behaviors (i.e., alcohol and tobacco use) and health status within the sample.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-35</td>
<td>130</td>
<td>47.97</td>
</tr>
<tr>
<td>36-55</td>
<td>125</td>
<td>46.12</td>
</tr>
<tr>
<td>56+</td>
<td>16</td>
<td>5.90</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>35</td>
<td>12.92</td>
</tr>
<tr>
<td>School</td>
<td>205</td>
<td>75.65</td>
</tr>
<tr>
<td>College</td>
<td>31</td>
<td>11.44</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3000-6000</td>
<td>16</td>
<td>5.90</td>
</tr>
<tr>
<td>6001-9000</td>
<td>35</td>
<td>12.92</td>
</tr>
<tr>
<td>9001-12000</td>
<td>81</td>
<td>29.89</td>
</tr>
<tr>
<td>12001-15000</td>
<td>79</td>
<td>29.15</td>
</tr>
<tr>
<td>Above 15000</td>
<td>60</td>
<td>22.14</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>175</td>
<td>64.58</td>
</tr>
<tr>
<td>Un married</td>
<td>96</td>
<td>35.42</td>
</tr>
</tbody>
</table>
From Table 1, 5.9% of the sample earn Rs. 6000 or below per month, while 12.92% earn between Rs. 6000 and Rs. 9000 per month. Only 22.14% of the respondents have a monthly income above Rs. 15000. This shows that incomes levels are low within the sampled population. This study was also interested in finding the prevalence of tobacco use among alcohol consumers. The results show that 69.74 percent of alcohol consumers in the study area also consume tobacco while 30.26 percent of the respondents consume only alcohol but not a mixture of the two, i.e., alcohol and tobacco, in the rural study area. It is difficult to find the reason for this behavior. Thus, as people combine alcohol and tobacco, health issues are likely to arise.

The present study used monthly alcohol expenditure to measure consumption pattern of each respondent. Table 1 above shows that majority of the people (67.90%) spend Rs. 3000 or below per month on alcohol, while 21.03% of the respondents spend between Rs. 3001 and 4500/p.m on alcohol. Similarly, a small number of the sample, 30 (i.e., 11.07%) spend more than Rs. 4500/p.m on alcohol. Thus, consumption of alcohol is very high in the study area. The high rate of alcohol consumption may be attributed to such factors as hard labor work (mostly in agriculture), stress, and marital problems.

The study also sought to find out the status of health of the respondents in the study area. The health status in the present study represents the self-reported health outcome (or status) by the respondent. Thus, alcohol consumers were asked to rate their health as poor, fair or good. The result shows 49.82 percent of respondents had poor health whereas 32.47 percent of the respondents reported to have fair health. Only 17.71 percent of the respondents reported to have a good health.

**Impact of alcohol consumption of self - reported health status**

The purpose of the present study was to estimate the impact of alcohol use on health status. Ordered probit model was used to achieve the stated objective. In the analysis of the ordered probit regression results, a positive sign of an estimated coefficient means that increases in that particular variable will improve (increase) the dependent variable in equation, whereas a negative coefficient implies that an increase in that particular variable leads to a fall in the dependent variable (see Boachie, 2013). The significance of the coefficient is seen in the p-value for that particular variable which is 0.05 or less for that parameter to be significant. Same can be said for the overall test for the model based on likelihood ratio. Table 2 below presents the estimates of the impact of alcohol consumption and health status while accounting for the effect of education, income, age, and tobacco use. The dependent variable is self-reported health status. The independent variables considered in the model are age, income, education, alcohol consumption expenditure, and tobacco use. Independent variables with positive coefficients means that increase in such variables will help improve the health status of the individual, whereas negative coefficients in the regression results suggest that health status will deteriorate when such variables rise.
Table 2: Factors Affecting Health Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient value</th>
<th>T value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>income</td>
<td>-.240</td>
<td>-1.47</td>
<td>0.142</td>
</tr>
<tr>
<td>Age</td>
<td>.0140</td>
<td>1.45</td>
<td>0.148</td>
</tr>
<tr>
<td>Education:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Education</td>
<td>0.616</td>
<td>2.18</td>
<td>0.029</td>
</tr>
<tr>
<td>College Education</td>
<td>0.739</td>
<td>2.01</td>
<td>0.045</td>
</tr>
<tr>
<td>Monthly alcohol expenditure</td>
<td>-0.852</td>
<td>-4.43</td>
<td>0.000</td>
</tr>
<tr>
<td>Tobacco consumption</td>
<td>-0.279</td>
<td>-1.79</td>
<td>0.073</td>
</tr>
<tr>
<td>/cut 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/cut 2</td>
<td>-7.167</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Log likelihood = -261.33804, obs= 271, LR chi2(6) = 29.6, Prob> chi2 = 0.000, Pseudo R2 = 0.0536

Dependent Variable: Self-Reported Health Status

Table 2 shows that two out of the five variables are statistically significant, at 5% level, in influencing health status within the sample since these variables had p-values less than 0.05. The statistically significant variables are alcohol use, school education and college education. Income, age, and tobacco use are not statistically significant at 5% level. Specifically, the coefficient of income is negative (i.e., -0.24) with a p-value of 0.142, suggesting that income is not statistically significant. This means that higher incomes do not improve the health of the respondents. Thus, as income increases the health status of the group tends to depreciate. The reason for this finding can be attributable to bad health behaviors that high income earners may adopt. This result is in line with Auster, et al. (1972) who argue that high income may lead to bad health behaviors since individuals may consume more healthcare services to compensate for the losses.

Another variable that was considered in the health status model is age. According to Grossman (1972), health stock depreciates with age. Thus, as a person advances in age his/her health status deteriorates. Contrary to the depreciation effect of age, the coefficient for age in the present study is positive (i.e., 0.014) with a p-value of 0.148. The implication is that increase in age does not have any significant effect on the health status of alcohol consumers. The positive sign suggests that any additional year may improve health status. We find this be very fascinating since rising age is associated with myriad health problems. In this regard, the insignificance of the coefficient of age is not surprising.

Education is one of the most important factors affecting health. As argued by Grossman (1972), education determines the efficiency of health production. In the present study, the coefficients for educational levels are positive and statistically significant in influencing health. First, school level recorded a positive coefficient of 0.616 (p=0.029). The implication of the present results is that persons who have attained school level education are more likely to have good health than uneducated one. Similarly, given the coefficient of college education variable (0.739; p=0.045), one can see that college graduates have a higher chance of reporting good health than the uneducated and those with school level education. The likelihood of having good health is higher for people with college education than those who have only school education. Thus, as one advances in education his/her health conditions are more likely to improve. The reason is that, as argued by Grossman (1972), education brings about allocative efficiency and productive efficiency. The finding on education

The overriding objective of this study was to investigate the impact of alcohol consumption on the health. As indicated in the methods section, we measured alcohol consumption by using alcohol related expenditure within the past 30 days prior to the interview. As shown in Table 2, the coefficient of alcohol consumption is negative (-0.852) and statistically significant (p=0.000). The results imply that persons who consume more alcohol (as measured by expenditure) are more likely to have poorer health those who do not consume alcohol. Thus, as alcohol consumption rises, the health status of the individual is more likely to deteriorate. This finding is not surprising. The reason is that alcohol usage results in such health problems as liver and cardiovascular diseases, cancers of the mouth, pharynx, and high blood pressures as reported by researchers such as Anderson, et al. (1993) and Edwards et al. (1994). In India, similar findings on the harmful effects of alcohol on health have also been reported (see Narawane et al., 1998; Shankar et al., 1986; Sharma et al., 2013).

Tobacco consumption is now identified as a major cause of several different forms of cancer, heart diseases, stroke and wide variety of other health problems and mortality. It is one of the unhealthy behaviors among the population. The results presented in Table 2 above show that tobacco has negative impact on health status. This is seen in its negative coefficient (-0.279). However, its effect on health is marginal as it was not significant at conventional 5% level, but 10%. The results imply that smokers are more likely to have poorer health status than non-smokers though the effect is not strong. This suggests that tobacco marginally leads to poor health.

**Conclusion and Suggestions**

In the present study the aim was to investigate the impact of alcohol use on health. The study reveals that nearly half, 47.97%, of alcohol consumers are in the 15-35 age group. This means that more young people are consuming alcohol which is neck wracking issue. Majority of the respondents are educated,75.65 percent of the respondents are educated up to higher secondary school. Married men constitute a significant portion of drinkers (i.e., 64%) and majority (69.74%) of the drinkers also smoke. It is therefore not surprising that 49.82% of the respondents are reported to have poor health at the time of the study.

The study finds that age, income, and tobacco consumption have no effect on the health of respondents. However, education and alcohol use have been found to be most important factors affecting the health status. While education improves health among the respondents, alcohol consumption deteriorated their health conditions. Thus, the poor health status reported by the respondents is because of alcohol.

Therefore, while raising education levels of the rural population, policy should also aim at improving health education among the people. This will help induce healthy behaviors among the male population through a reduction in, for example, alcohol and tobacco consumption. Also, restrictions on the sale of alcohol can be imposed to reduce consumption, if it is impossible to stop. This has to be implemented to its fullest. For instance, decreasing the number of wine shops and/or raising prices of alcohol via taxation will be a right step. Another policy which will improve the health of the people is a ban on alcohol. Thus, wine shops in the rural areas must be permanently closed. However, the implementation of this policy requires much political will on the part of government.

Given that persons below the age of 21 are found drinking alcohol, proof of age should be a requirement for the purchase of alcohol. Thus, sales agents must demand age proof from prospective buyers. Such proofs can be done by simply inspecting the identity card of the buyer and such rules must be strictly enforced. Similarly, rehabilitation and counseling centers should be established in rural areas to help people who are negatively affected by alcohol and those who wish to quit. The rehabilitation and counseling centers will help bring a health behavioral change among the people and result in improved health.
References