Alcohol and tobacco use among males in two districts in Sri Lanka

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(Index words: alcohol drinking, smoking, epidemiology, tobacco use)

Abstract

Objectives To investigate the prevalence and consumption of tobacco and alcohol among males in the Colombo and Polonnaruwa districts.

Design A cross-sectional study based on multistage cluster sampling was carried out in four Medical Officer of Health (MOH) areas in the Colombo (urban) and Polonnaruwa (rural) districts to assess the prevalence of tobacco and alcohol use. The Public Health Midwife areas were considered as primary clusters. The sample consisted of males over 18 years. There were 1318 from the Colombo District and 1366 from the Polonnaruwa District. The quantity frequency method was used to assess consumption.

Results Abstinence was significantly higher in the rural areas (75.2%) compared to urban areas (56.6%) (p<0.001). Prevalence of current drinking in the urban areas (32.9%) was significantly higher than in rural areas (20.8%) (p<0.001). Alcohol consumption in the urban areas (33.1 units/week) was significantly higher than in rural areas (20.9) (p<0.004). 51.6/1000 males in the urban areas and 14.6/1000 males in rural areas consumed daily. The prevalence of current smoking was also higher in the urban areas (29.9%) than (p=0.052) in rural areas (24.4%).

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Conclusion High-risk alcohol consumption was prevalent especially in urban areas as indicated by the mean alcohol consumption and number who consumed spirits daily. The prevalence of smoking is much lower than in many Asian countries but similar to western Europe.

Introduction

Tobacco and alcohol have especially serious impacts on health among the poorest in poor nations. Tobacco is the single most preventable cause of death in the world today. Worldwide about 4 million people die annually from tobacco related causes and by the late 2020's the estimated toll will be about 10 million [1,2]. Both the average volume of alcohol consumed and patterns of drinking have been shown to influence alcohol related burden of disease [3]. Alcohol causes 1.8 million deaths and a loss of 58.3 million disability-adjusted life years (DALY) [4]. Because alcohol kills and disables at a relatively young age, its impact on DALY is relatively higher than that of other major causes of premature deaths [5].

Accurate data, especially regarding alcohol consumption in Sri Lanka is scarce. Figures are available at the Department of Excise for quantities of arrack, beer, toddy and country made foreign liquor sold, but data regarding illicit alcohol is not available [6]. The accuracy of even the available data is questionable. For example, the Global Survey on Alcohol reports total recorded alcohol consumption per capita in those over 15 years of age in Sri Lanka as 0.18 litres of pure alcohol which is much lower than the corresponding figures for India (0.82), Bhutan (0.57), Malaysia (1.06), and Thailand (8.47) [4].

Community surveys on the use of alcohol and tobacco in Sri Lanka are few. Estimates of alcohol consumption are usually inaccurate because of high levels of consumption of illicit alcohol ('*Kasippu*'). Accurate data on tobacco and alcohol consumption are necessary to understand the magnitude of harm caused by these substances and to plan prevention and treatment responses. We carried out a survey using a quantity frequency method to assess alcohol and tobacco use among males over 18 years of age in an urban and a rural district in Sri Lanka.

Methods

A multistage cluster sampling was carried out in 4 Medical Officer of Health (MOH) areas in the Colombo (urban) and Polonnaruwa (rural) districts to assess the prevalence of alcohol and tobacco use in males over 18 years of age. Nugegoda and Moratuwa MOH areas located in the district of Colombo are densely populated, suburban areas. Thamankaduwa and Elahara located in the district of Polonnaruwa are rural agricultural areas in the north central part of Sri Lanka. Each MOH area has a population of 80,000-90,000 and is divided into Public Health Midwife (PHM) areas for delivery of community based healthcare

services. Sixty five PHM areas were considered as primary clusters. Roads within the primary clusters were considered as secondary clusters. All male occupants over 18 years of age in randomly selected houses were included in the study.

The data collection was carried out as part of a pre-intervention assessment in a programme to reduce alcohol and tobacco use in selected MOH areas. The sample size was calculated to detect a 20% reduction in use. The study was conducted during May to August 2007. Information was obtained using an interviewer-administered questionnaire.

Alcohol consumption was quantified for each person using quantity-frequency estimation. Consumption was recorded for the past 30 days through self report. The type of beverage consumed, the average number of days per week alcohol was consumed and the average consumption on each occasion was recorded for different beverage types. The reported consumption was converted to units using average ethanol content of the different beverages. For cigarettes, the brand and average consumption per day were recorded.

Informed consent was obtained from all respondents. Approval was obtained from the Ethics Committee of the Faculty of Medicine, University of Colombo.

Statistical analysis

The cluster sample was analysed using SPSS v 13.0. A plan file was created weighing the cases according to the probability of selection. Calculation of frequencies, means, cross tabulations, t test and logistic regression was carried out using the complex sample command, utilizing the plan file. Chi square tests were used to determine the differences between groups. Logistic regression was done to find the unadjusted association of variables with current smoking and current drinking. The t test was used to test the difference in mean alcohol and cigarette consumption between urban and rural districts. Sixty records with incomplete data were excluded from the analysis.

Results

Study population

The study population consisted of 2684 males over 18 years. There were 1318 from the urban areas and 1366 from the rural areas. There was no significant difference in mean age between urban and rural males (p=0.41). Urban males had a significantly higher income (p<0.001). The ethnic distribution (percentages) was Sinhalese 92.1, Tamils 2.7, Moor 4.5 and others 0.6. The percentage distribution of the sample by religion was Buddhists 82.5, Christian 11.2, Muslim 4.5 and Hindu 1.8. Distribution according to religion was significantly different between urban and rural groups (p<0.001), but racial distribution was not (p=0.133).

Alcohol and tobacco use

Current drinkers were defined as those consuming one or more drinks during the past 30 days and current smokers as those smoking one or more cigarettes during the past 30 days. Those who did not consume alcohol during the past 12 months were classified as abstainers. There were significantly more abstainers in the rural areas (75.2%) than in urban areas (56.5%) (p<0.001). Table 1 gives the odds for current drinking and current smoking. Odds of current drinking was lowest among the Moor ethnic group (OR 0.40) and the Muslim religious group (OR 0.43). The 45-54 year age group had the highest odds of being current drinkers (OR 7.11) or current smokers (OR 4.84).

Table 2 gives the prevalence of current smoking and drinking by area, age and income. Overall, prevalence of current drinking was 27.8% and current smoking 27.6%. The prevalence of current drinking in urban areas (32.9%) was significantly higher than in rural areas (20.8%) (p<0.001). The prevalence of current smoking in urban areas (29.9%) was also higher than in rural areas (24.4%) (p=0.052). In both urban and rural areas the prevalence of alcohol use and smoking increased with age, reaching a maximum in the 45-54 year category, and decreasing thereafter. In urban areas, the prevalence of drinking and smoking were highest among the lowest income category (<Rs. 5000).

Table 3 shows the mean quantities of alcohol and tobacco consumed by users. The mean consumption of alcohol in urban areas (33.1 units/week) was significantly higher than in rural areas (20.9 units/week) (p=0.004). Mean number of cigarettes smoked in urban areas (49.2/week) was higher than in rural areas (43.2/week) (p=0.21). From the age of 25 years tobacco consumption increased with age and decreased after 65 years of age. There was no clear age related pattern for amounts of alcohol consumed. The mean alcohol consumption in urban areas was highest among the Rs. 8000-14999 income category and in rural areas was highest among the Rs. 15000-24999 income category.

Table 1. **Odds ratios (95% confidence intervals) from logistic regression for current drinking and current smoking**

	Current drinking OR (95% CI)	*Current smoking* OR (95% CI)
Race		
Sinhala	1.0	1.0
Tamil	1.76 (0.87-3.56)	0.97 (0.58-1.65)
Moor	0.40 (0.20-0.81)	0.99 (0.64-1.52)
Burgher	1.23 (0.24-6.36)	1.90 (0.32-11.25)
Religion		
Buddhist	1.0	1.0
Hindu	1.62 (0.78-3.4)	0.58 (0.24-1.43)
Muslim	0.43 (0.21-0.87)	0.99 (0.64-1.54)
Catholic	1.54 (0.89-2.67)	0.95 (0.57-1.57)
Christian	2.22 (1.19-4.20)	1.50 (0.85-2.66)
Age		
18-24 yrs	1.0	1.0
25-34 yrs	3.15 (2.0-4.96)	1.88 (1.28-2.76)
35-44 yrs	6.61 (4.30-10.18)	4.09 (2.71-6.18)
45-54 yrs	7.11 (4.78-10.55)	4.84 (3.19-7.37)
55-64 yrs	4.90 (3.11-7.73)	3.76 (2.39-5.91)
>65 yrs	2.67 (1.47-4.83)	1.89 (1.15-3.11)
Income SLR		
<Rs. 5000	1.0	1.0
Rs. 5000-7999	0.92 (0.71-1.18)	1.0 (0.74-1.34)
Rs. 8000-14999	1.39 (1.07-1.80)	0.86 (0.63-1.19)
Rs.15000-24999	1.06 (0.77-1.44)	0.69 (0.45-1.05)
Rs. 25000-39999	0.83 (0.54-1.27)	0.54 (0.29-1.0)
>Rs. 40000	1.88 (0.83-4.27)	0.54 (0.22-1.29)

Table 2. **Prevalence of current drinkers and current smokers by area, age and income**

	Current drinkers		Current smokers	
	Urban n=1318 (95% CI)	*Rural n=1366 (95% CI)*	*Urban n=1318 (95% CI)*	*Rural n=1366 (95% CI)*
Age				
18-24 yrs	11.6 (7.3-18.1)	4.1 (1.9-8.3)	13.8 (8.5-21.6)	9.5 (5.7-15.6)
25-34 yrs	28.9 (23.2-35.4)	16.1 (12.3-20.8)	24.6 (17.4-33.6)	16.1 (12.0-21.4)
35-44 yrs	43.0 (35.8-50.6)	30.3 (23.2-38.4)	37.4 (30.9-44.4)	32.1 (25.7-39.3)
45-54 yrs	46.3 (40.8-52.0)	31.4 (26.4-37.0)	38.1 (31.5-45.2)	42.5 (34.9-50.5)
55-64 yrs	33.6 (25.2-43.1)	28.2 (22.7-34.5)	38.3 (28.5-49.1)	26.2 (19.4-34.4)
>65 yrs	26.2 (16.9-38.4)	12.9 (7.3-22.0)	22.3 (14.2-33.2)	19.6 (12.7-29.1)
Income SLR				
<Rs. 5000	37.9 (30.3-46.1)	21.1 (17.0-25.9)	44.8 (29.6-61.1)	25.7 (21.0-31.0)
Rs. 5000-7999	26.9 (21.7-32.8)	20.4 (15.7-26.0)	34.7 (29.0-41.0)	25.8 (20.4-32.0)
Rs. 8000-14999	37.4 (32.3-42.9)	21.7 (17.2-27.1)	29.2 (25.4-33.3)	25.1 (19.1-32.2)
Rs. 15000-24999	29.3 (22.6-37.1)	21.0 (15.3-28.2)	24.2 (17.0-33.2)	22.2 (14.2-32.8)
Rs.>25000	28.8 (20.5-38.9)	16.3 (9.1-27.3)	21.6 (13.8-32.3)	12.8 (7.2-21.9)
Overall	**32.9 (29.4-36.7)**	**20.8 (18.3-23.7)**	**29.9 (25.7-34.4)**	**24.4 (21.2-28.0)**

Table 3. **Mean consumption of alcohol units/week and number of cigarettes/week (95% confidence intervals) for current smokers and current drinkers by area, age and income**

	Alcohol consumption – units/week		Smoking – cigarettes/week	
	Urban (95% CI)	*Rural (95% CI)*	*Urban (95% CI)*	*Rural (95% CI)*
Age group				
18-24 yrs	13.4 (3.6-23.1)	26.7 (4.0-49.3)	43.8 (32.6-55.0)	33.8 (23.2-44.3)
25-34 yrs	21.2 (14.0-28.4)	19.6 (8.2-31.1)	36.6 (29.8-43.4)	31.8 (26.3-37.3)
35-44 yrs	46.8 (30.7-62.9)	19.8 (10.0-29.7)	51.0 (43.1-58.9)	40.1 (29.7-50.5)
45-54 yrs	26.7 (19.2-34.2)	23.9 (11.8-36.0)	56.6 (44.9-68.2)	47.0 (32.0-62.0)
55-64 yrs	40.7 (22.3-59.1)	19.5 (10.8-28.1)	59.5 (45.0-74.0)	61.5 (40-86.9)
>65 yrs	27.3 (12.4-42.2)	18.2 (-1.8-38.2)	25.2 (15.7-34.6)	42.2 (17.0-67.4)
Income SLR				
<Rs. 5000	29.4 (10.1-48.7)	22.2 (11.6-32.7)	49.9 (38.0-61.8)	42.0 (32.7-51.4)
Rs. 5000-7999	34.2 (21.1-47.3)	16.0 (9.9-22.0)	44.8 (36.3-53.2)	42.4 (31.7-53.1)
Rs. 8000-14999	38.9 (28.7-49.2)	17.4 (9.9-24.8)	50.0 (40.1-59.8)	48.7 (30.7-66.6)
Rs. 15000-24999	22.1 (13.7-30.6)	36.4 (12.0-60.7)	51.9 (38.7-65.0)	39.5 (21.0-58.0)
>Rs. 25000	26.1 (13.5-8.8)	10.1 (5.7-14.5)	49.9 (33.0-66.7)	21.8 (11.3-32.4)
Overall	**33.1 (26.6-39.6)**	**20.9 (16.1-25.9)**	**49.2 (45.0-53.3)**	**43.2 (34.4-51.8)**

Type of beverage used

When indicating the types of beverages used some men reported more than one type. Of the total study population in the urban areas 16.9% drank beer, 26% drank arrack and 3.4% drank 'kasippu'. Of the rural population 5.1% drank beer, 16.1% drank arrack and 5.1% drank 'kasippu'. The consumption of imported beverages such as whisky, brandy, rum and gin was 3.3% in urban and 1.2% in rural areas.

High risk drinking

The rate of daily drinking of arrack or 'kasippu' was 51.6/1000 in urban and 14.6/1000 in rural areas. 14.8% (CI 12.5-17.3) of all urban males and 5.8% (CI 4.4-7.5) of all rural males consumed >14 units of alcohol per week. Amongst alcohol users 27.7% of rural users (CI 22.0-34.3) and 44.9% of urban users (CI 38.3-51.7) consumed >14 units/week.

Discussion

We found that for both alcohol and tobacco use, prevalence as well as consumption was higher in urban areas. Those with the lowest income (<Rs.5000) had the highest prevalence of alcohol and tobacco use in urban areas. Overall prevalence of alcohol and tobacco use increased with age, reached a maximum in the 45-54 year category and decreased after the age of 55 years. Heavy drinking in urban areas was substantial, where the mean consumption among users was 32.9 units of alcohol week.

Tobacco use is growing fastest in low-income countries, due to steady population growth coupled with tobacco industry targeting, which ensures that millions of people become addicted every year [7]. The prevalence of smoking in our study (27.6) was much lower than in other Asian countries, such as, China (57.4%), Indonesia (52.4%), Bangladesh (41%), Philippines (40.3%) India (32.7%) and Thailand (34.1%), and similar to countries in western Europe, such as France (28.2%), Germany (27.9%) and the United Kingdom (27%) [7]. This may be the result of effective tobacco prevention programmes that have been carried out over many years. Both smoking prevalence and the amount of tobacco consumed increased with age but declined after the age of 65 years. Tobacco is a highly addictive substance and users tend to consume more with time. The reduction seen in old age may be because a proportion of heavy smokers die while some others may give up for health reasons.

The abstinence rates among males for alcohol use in rural (75.2%) and urban (56.5%) areas in this study are comparable to those in India (67.1%) but much higher than those recorded for western countries such as the UK (9%) or the USA (29.3%) [4]. Our study did not specifically investigate for features of dependence among alcohol users. However, daily consumption of arrack or 'kasippu' (which can be used as an indicator of dependence) was 51.6/1000 in urban areas, which is much higher than the rate of dependence of 29/1000 reported in a study carried out in Colombo in 1987 [8].

Although a substantial proportion of males did not consume alcohol during the past 12 months, the high level of consumption among users, especially in the urban areas, is a matter for concern. Asian males are at risk of alcoholic fatty liver when consumption is >14 units/week [9]. Given the levels of consumption, risk for fatty liver and other medical complications are high among both rural and urban users. 'Per capita consumption' is used often as a measure of consumption and as an indicator of the likely extent of alcohol related health problems in a country. In countries with high abstinence rates per capita consumption does not accurately reflect consumption. In such countries per capita consumption among drinkers is a more meaningful measure and is more likely to reflect levels of risk among drinkers.

This study has several limitations. Only 2 MOH areas from each of the 2 districts were surveyed. Data collection was by self reports, which raises the issue of recall bias. The daily variation in drinking patterns was not recorded. Thus binge drinking and occasions of more than average consumption were ignored. Graduated frequency measurements which take into account patterns as well as volumes of consumption may have been more accurate in this regard [10]. In both urban and rural areas the percentage of drinkers claiming to use 'kasippu' was much lower than those using arrack. This is probably because 'kasippu' users claim to drink arrack, as 'kasippu' is an illicit beverage and its use is a social stigma. All these limitations are likely to have led to an underestimation of consumption. The findings of this study, therefore, highlight the need to take up alcohol and tobacco prevention as a priority in Sri Lanka.

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