



▪ **Original Article**

## Alcohol consumption among women in a district of eastern Nepal

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### Abstract

**Background:** The World Health Assembly has declared alcohol related problems to be a major public health concern all over the world. It has a serious health effect on women. **Objectives:** To assess the strength, pattern and associated health problems among the female population in Sunsari district of Nepal. **Methods:** A representative sample of 2397 females aged 15 years and above were interviewed in Sunsari district in 2003. **Results:** Among the respondents, 16.6% of females were current alcohol users [95%CI=15.11 to 18.09] among which 14.7% in the reproductive age were consuming alcohol. About 23% of daily users, who were taking more than 524 ml of Homemade 'Raksi' were at high risk. Alcohol-users were more likely to use tobacco. About 15% of women were found be taking alcohol even during pregnancy. Exactly 42% of users and 27.5% of non-users reported to have health problems ( $P<0.0001$ ). Self-reported illnesses among alcohol users were gynecological (40.1%), muskulo-skeletal (18.6%), headache (18.6%), cardiovascular (14.4%), and respiratory problem (9.0%). **Conclusions:** The prevalence of alcohol use among females was 16.6% in Sunsari district. 'Local Raksi' was the most common. Alcohol users were nearly two times to have health problem than the non-users [OR=1.7, 95% CI=1.4 to 2.0,  $P<0.001$ ]. The adverse effect of alcohol on female is a serious issue for her health and also to her fetus. Health educational campaigns related to alcohol control should be directed at the community and emphasized them to go for the regular health check up.

**Keywords:** female, alcohol, prevalence, Sunsari, Nepal

### Introduction

The World Health Assembly in 1983, declared alcohol related problems to be a major public health concern all over the world. The term 'alcohol problems' (problems caused by alcohol that may require treatment) refers as to a broad array of acute and chronic medical, behavioral and social problems<sup>1,2</sup>. They may range from mild to severe<sup>3</sup> depending upon several factors including the pattern of consumption. The trend of alcohol consumption is increasing day by day in Nepal. The origin of the production and consumption of alcoholic beverages are as old as the origin of the books; "VEDAS", "KIRANT MUNDHAM", and "BIBLE". There is no doubt that the excessive consumption of alcohol plays supportive role in causation of mortality

and morbidity; it reduces the duration of quality life of human beings.

Some people in Nepal generally believe that alcohol is a medicine for cold, pain, tension and tiredness; some believe that celebration, party and festival are success if alcohol is served. It has become an essential thing for Kirat and Newari cultures. Generally they take alcohol thinking as a given right by their religion. The use of alcohol may lead to addiction. Due to which, women may have fallen into the trouble. It is a serious issue. Not only on social impact have this habit, it directly affects on health of pregnant mother, which also affects fetus. The habit of mother may also influence the child. Again, the drinking habit for the female may lead to divorce in family life because of not accepting this situation in Nepalese society. Due to these reasons alcohol may be one of the sensitive problems among female, if we seriously considered the

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magnitude and extent of the problem it has created in Nepal. Thus, the study was focused to identify the prevalence, distribution and associated health problem among the women in Sunsari district.

## Methods

### *Population and sampling*

This is a cross-sectional study. The study site was Sunsari district of eastern Nepal. The population of female in the reproductive age was 51.08 % of the total female in Sunsari district during the time of study<sup>4</sup>. Sunsari district consists of 3 municipalities and 49 Village Development Committees (VDCs) with unequal population distribution. The samples from each municipality and VDC were selected so as to represent the population of Sunsari district. Cluster Random Sampling technique was used to select the subjects.

The sample size was a set of all females aged 15 years and above from 2000 households, which were set in 100 compact clusters of households, each of 20 households: one cluster was allocated purposively in each VDC and municipality, totaling 52 clusters in 49 VDCs and 3 municipalities. This enhanced the representatives of each VDC and municipality in Sunsari. The remaining 48 clusters were distributed with probability proportionate to size. As a result the number of clusters per VDC and municipality varies from 1 to 10.

Again to select 20 households for each cluster, the number from 11 to 49 was chosen randomly, first digit showed the direction to proceed survey from a junction of VDC or municipality, indicating 1-north, 2-east, 3-south and 4-west. The second digit showed number of house from where the survey was started in that direction. The females were interviewed continuously on the direction till to get 20 households for each cluster.

The sample size was calculated on the basis of cluster design, which is sufficient enough to face the prevalence alcohol use among female (8.3) in Sunsari district<sup>5</sup> with permissible error 20% and design effect is taken as 2.

### *Techniques and Tools for Data Collection*

An interview method with pre-tested questionnaire in Nepali language was applied to collect the information. The questionnaire was consisted of dependent variables i.e. alcohol drinking habit, and pattern of consumption; and independent variables i.e. socio-demographic status; age, level of education, and occupation etc. The ten

trained female-enumerators collected the data.

### *Validity and Reliability*

Appropriateness of questionnaire format, validity of content, level of difficulty and length of time required to complete the survey, were also determine. The face validity and content validity of the questionnaire were tested with 100 women who did not participate in the study. The Kappa reliability coefficient was calculated 0.73, indicating that, overall, participants responded consistently to questionnaire items.

### *Data Entry and Analysis*

The data was entered into the computer by means of questionnaire entry format in dBASE IV program. The records were regularly checked to avoid entry error. The purified data was analyzed in SPSS 10.0 program. Chi square test for proportion, and logistic regression to know the significant factors associated with the alcohol use.

## Results

### *Prevalence of alcohol use according to socio-demographic characteristics*

The prevalence of alcohol consumption among the women in Sunsari was 16.6% [95%CI=15.11 to 18.09]. No significant difference in prevalence was observed between urban and rural population. There were 2.3% of past users. Around 25% of those in the age 50 years and above, compared with 14.7% of the reproductive age group 15-to-49 years were alcohol users ( $P<0.0001$ ). Widow and separated or divorced women were significantly likely to take alcohol in comparison with others ( $P<0.0001$ ). Univariate analysis shows that the prevalence of alcohol consumption according to the level of education was significantly decreased ( $P<0.0001$ ). Businesswomen, unskilled laborer and unemployed women were found more likely to use alcohol than others. There was only one case of alcohol consumption among female students. Economically active population was more likely to consume alcohol than economically inactive group ( $P<0.0001$ ). No single Christian and Muslim women were found to use alcohol, whereas, women of Kirat, Buddhist and Hindu religion were found 58.3%, 42.9% and 17.4% respectively (Table 1).

### *Pattern of alcohol use*

The pattern of alcohol in this study refers to the types of product, duration and frequency of consumption,



and its' estimated quantity in milliliters (ml). One glass contains about 175 ml of alcohol. About 88% of women were taking homemade distilled products; 'Local Raksi' and nearly 57% were taking 'Jhandh', 'Tongba', 'Chhyang' etc. Among industrial products, non-distilled product (12%), beer was consumed nearly double than distilled products; like Whisky, Wine, and Vodka. Industrial products were less in use than homemade products. About 61% of users were occasional and 20% were daily users. Among the users 37% were taking alcohol for 20 years. In addition to that among the daily users 65% of them were taking for more than 20 years (Table 2).

Among daily users, 23.4% of women, who were taking more than 524 ml of distilled homemade products among daily users, were at high risk of alcohol addiction. The percentage of drinkers who used to take less than 176 ml of alcohol were more for all type of users, in both homemade products; but in case of industrial products, more than 524 ml of alcohol consumption were found to be more among daily users (Table 3).

#### ***Alcohol drinking; health status of women and their husband habit***

About 15% of women were found to take alcohol even in pregnancy. This is a serious issue for her health and also to her fetus. However the difference of the habit according to the pregnancy status was not significance. Exactly 42% of users and 27.5% of non-users reported to have health problems. The difference was statistically significance ( $P < 0.0001$ ). And also the alcohol users were nearly two times to have health problem than the non-users. The consumption of alcohol was significantly affected by the husband's habit ( $P < 0.0001$ ); and also, the married women including separated or divorced whose husbands were alcohol consumers were nearly twelve times likely to consume alcohol than of non users' husband (Table 4).

The top five illnesses reported by the alcohol users were gynecological problem (40.1%), muskulo-skeletal problem (18.6%), headache (18.6%), cardiovascular problem (14.4%) and respiratory problem (9.0%) respectively (Figure 1).

#### **Logistic regression model on alcohol consumption with the associated variables**

A logistic regression analysis was under taken to determine the independent variables that best predicted current alcohol users after consideration of the effects of the others variables<sup>6</sup>. The following variables were

not associated with current alcohol use and were excluded from the model; marital status, education, religion and economically active.

The women whose family included at least an alcohol user were nearly 8 times likely to be alcohol users than non alcohol user's family. Similarly, person who used to take smoke, smokeless tobacco, suffered with health problems and older aged (50+ years) women were more likely to be alcohol users. But the use of alcohol among women were negatively associated with the factors; housewife, unemployed women, major hill caste, Terai occupational caste and other castes women, and urbanized women in the variables, which were less likely to be alcohol users (Table 5).

From the summary of the model, -2 log likelihood was calculated as 1372.94 and Cox and Snell R Square value was 0.28, indicating that 28% of the variance in alcohol use was explained by the logistic regression model.

#### **Discussion**

This is a community-based survey, carried out in a district of eastern Nepal, aimed to report the prevalence and pattern of alcohol use and factors related to the habit among the women. The categories of alcohol consumption have been derived on the basis of Sunsari Health Interview Survey, 1994<sup>5</sup>. The study reported the prevalence of alcohol consumption among the women aged 15 years and above in Sunsari district was 16.6%, which indicates that the alcohol consumption among the women has been nearly doubled in the period of nine years as Sunsari Health Interview Survey, 1994 had reported 8.3% women consumed alcohol in Sunsari. The study supports the current finding that the prevalence of alcohol use was increased with increasing age groups and declined after older age. The finding was supported by a study done in Taiwan<sup>7</sup>. Our result may have underestimated the true prevalence of alcohol consumption as most of the women in Nepalese society do not want to express their alcohol habit freely.

Women belonging to hill native castes were most likely to consume alcohol than the others; generally they were originated from hill area of northern part of Sunsari district, where life is quite hard. Over the period of time, these people tend to migrate to urban and plain areas for easy life and better job prospective<sup>8</sup>; therefore, there are a good number of people belonging to the



caste in Sunsari. The castes also called 'Matawali' demands the alcohol for social, cultural and religious purposes. Nearly 20% of Nepalese society is belonging to this category.<sup>4</sup>

A study in young Australian women reported that non-drinkers were more likely than drinkers to be married<sup>9</sup>. But the finding of this study reported that separated or divorced women were more likely to and unmarried were less likely to use alcohol than others. The result might not show real picture as the separated or divorced women were less in number to draw any conclusion and it was therefore considered as a limitation. This study could not able to present about family income because of non-responses, however the respondents were provided the confirmation that the data would not be disclosed for other purpose. It might be due to the fear of Maoist. During the survey, the country was currently suffering increasing attacks on properties and incidents of violence related to a brutal Maoist insurgency.

Distilled homemade and industrial products usually contain high concentration of alcohol. The concentration of alcohol in distilled liquor was assumed to be 40% and 5% in non-distilled liquor.<sup>5</sup> The concentration in normal beer ranges from 4.4% to 6.5% and normally 42.8% in distillates and 12.5% in wine<sup>10</sup>. The study revealed that the local Raksi, a distilled homemade product was most popular drink among the women. The reason may be that it can be produced in own houses and raw materials for preparation are easily available and cheaper in cost. This is in contrary to practices in developed countries like Denmark, as a study showed the industrial products like beer or wines were more common<sup>11</sup>.

The result indicated that daily users were likely to have habit of alcohol consumption for long period than other types of user. The group may be in alarming situation for health if the consumption exceed out of limit. The quantity and frequency of alcohol should be limited to obtain its beneficial effect; otherwise, the excess consumption may lead to serious health hazards. Nearly 23% of women, who were taking more than 524 ml of distilled homemade products among daily users, were at high risk of alcohol addiction. A study showed that there was a linear relationship between alcohol intake and the risk of type II diabetes. Serum insulin and HDL-Cholesterol explained a small amount (20%) of the reduction in risk of type II diabetes associated with

moderate drinking. The adverse effect of heavy drinking seemed to be partially mediated through its effect on body weight<sup>12</sup>. Similarly, many studies supported that heavy drinking is a risk factor for diabetes<sup>13,14,15</sup>. Problems related to alcohol use and misuse can seriously affect many of the health concerns common among older women, including chronic illness and depression<sup>16</sup>. The finding of a prospective study among women of Maryland added evidence that the assessment of vulnerability to heavy alcohol use in women include consideration of depression<sup>17</sup>. However, there are some studies, which reported that there was no association of alcohol with diabetes<sup>18,19</sup>. Again, low level of recent alcohol intake was associated with a reduced risk for non-Hispanic white women.<sup>22</sup> But in this study reported significant health problems among the women due to the alcohol consumption; the health problems might have been more if they were examined clinically. In developing country like Nepal, alcohol abuse with all its adverse effects does not come to the attention of doctors, is largely tolerated and problems are treated by 'local quacks', and faith healers with dubious results. Despite the high prevalence, records show that not more than 2% of the patients attending a psychiatric clinic in Nepal reported with alcohol-related problem<sup>20</sup>. This study has not gone for alcohol related problems. There is a wide scope to identify the degree of problem drinking and alcohol dependence among the group using screening instruments like CAGE, AUDIT, TWEAK etc.

The results showed that the women whose husbands use alcohol are more likely to be alcohol users than the wives of non-user person and also alcohol drinking was positively associated with tobacco use; again, tobacco use is obviously risked of different diseases like cancer, asthma, adenoma etc. Moreover, alcohol and smoking in pregnancy are risk factors for different diseases as it not only affects mother, but also affects fetus. A study suggests that these substances are associated with the risk of adenoma<sup>21</sup>. The alcohol consumption among the females in the reproductive age should be discouraged through effective media, although low dosage regular consumption in old age has reduced risk in some disease as discussed above. It is because; alcohol addiction arises through alcohol use.



**Table 1. Prevalence of alcohol consumption among the women in Sunsari, 2003(n=2397)**

	Alcohol		P Value
	Consumption, % (n=397)	No consumption, % (n=2000)	
<b>Current users</b>	16.6	83.4	<0.0001
<b>Past users (n=46)</b>	2.3	97.7	<0.0001
<b>Residence</b>			NS
Rural	16.6	83.4	
Urban	16.2	83.8	
<b>Reproductive and old age</b>			<0.0001
15-49	14.7	85.3	
50+	24.9	75.1	
<b>Marital status</b>			<0.0001
Unmarried	6.5	93.5	
Married	16.4	83.6	
Separated/Divorced	45.8	54.2	
Widow	21.5	78.5	
<b>Education</b>			<0.0001
Illiterate	19.6	80.4	
Literate	12.9	87.1	
Primary Level	15.0	85.0	
Secondary Level	10.1	89.9	
Higher Secondary & above	9.1	90.9	
<b>Occupation</b>			<0.0001
Housewife	14.1	85.9	
Business	26.1	73.9	
Services	5.9	94.1	
Unskilled laborer	24.8	75.2	
Unemployment	17.7	82.3	
Students	2.0	98.0	
<b>Economically active/inactive**</b>			<0.0001
Economically active	24.5	75.5	
Economically inactive	14.0	86.0	
<b>Caste/Ethnicity***</b>			<0.0001*
Major hill caste	13.6	86.4	
Hill occupational caste	34.8	65.2	
Hill native	42.2	57.8	
Major terai caste	7.2	92.8	
Terai occupational caste	21.1	78.9	
Terai trader	0.0	100.0	
Religious caste	0.0	100.0	
Others	19.4	80.6	
<b>Religion</b>			<0.0001*
Hindu	17.4	82.6	
Christian	0.0	100.0	
Kirat	58.3	41.7	
Buddhist	42.9	57.1	
Muslim	0.0	100.0	

\*Chi-square test excluding zero prevalence NS=Not Significance

\*\* Economically active – Business, Service, Unskilled labor and Agriculture; Economically Inactive – Housewife, Unemployed and students.

\*\*\* Ethnicity: Major Hill – Brahmin, Chhetri, Newar; Hill Occupational – Bishwakarma, Sarki, Pariyar, Giri; Hill Native - Rai, Limbu, Magar, Tamang, Gurung; Major Terai Caste – Jha, Sharma, Tiwari, Tharu, Yadav etc.; Terai occupational caste –Khatbe,Musahar, Raut, Sutia, Jhangad, Batar, Mandal, Dhobi etc.; Terai Traders – Kayestha, Marwadi,Gupta, Baniya etc; Religious Caste Musalman, Ansari; Others Bhujel, Sardar, Sherpa, Jain, Sinha, Singh, Bangali etc (5,6,7).



**Table 2. Pattern of alcohol consumption among the women in Sunsari, 2003**

Pattern	Users (%)			Total (n=397)
	Daily (n=80)	Weekly or More (n=76)	Occasional (n=241)	
<b>All</b>	20.2	19.1	60.7	100.0
<b>Types of product</b>				
Distill homemade	96.3	96.1	82.2	87.7
Non-distill homemade	66.3	61.8	52.3	56.9
Industrial distill	11.3	3.9	6.6	7.1
Industrial non-distill	11.3	9.2	13.3	12.1
<b>Duration</b>				
<1	1.3	1.3	4.1	3.0
1-5	7.5	5.3	22.4	16.1
6-10	5.0	19.7	22.4	18.4
11-15	12.5	21.1	11.6	13.6
16-20	8.8	7.9	14.1	11.8
>20	65.0	44.7	25.3	37.0

\* Type: Homemade distilled product- Local Raksi; non-distilled product-Tongwa, Chhyang, Jhandh, etc ;  
Industrial distilled product – Whisky, Rum, Vodka and Jin, etc; Non-distilled product – Beer

**Table 3. Quantity and frequency of consumption by the type of products**

Frequency of consumption	Quantity of consumption*, % (#)			Total
	< = 175 ml	(176-524) ml	>=525 ml	
<b>Distilled homemade products</b>	61.8 (215)	25.9 (90)	12.4 (43)	100.0 (348)
Daily	48.0 (37)	28.6 (22)	23.4 (18)	22.1 (77)
Weekly	52.0 (38)	37.0 (27)	11.0 (8)	21.0 (73)
Occasionally	70.7 (140)	20.7 (41)	8.6 (17)	56.9 (198)
<b>Non-distilled homemade products</b>	64.6 (146)	23.9 (54)	11.5 (26)	100.0 (226)
Daily	50.9 (27)	30.2 (16)	18.9 (10)	23.4 (53)
Weekly	53.2 (25)	36.2 (17)	10.6 (5)	20.8 (47)
Occasionally	74.6 (94)	16.7 (21)	8.7 (11)	55.8 (126)
<b>Industrial distilled products</b>	71.4 (20)	74.3 (4)	14.3 (4)	100.0 (28)
Daily	22.2 (2)	33.3 (3)	44.5 (4)	32.1 (9)
Weekly	100.0 (3)	0.0 (0)	0.0 (0)	10.7 (3)
Occasionally	93.7 (15)	6.3 (1)	0.0 (0)	57.1 (16)
<b>Industrial non-distilled products</b>	68.8 (33)	10.4 (5)	20.8 (10)	100.0 (48)
Daily	22.2 (2)	33.3 (3)	44.5 (4)	18.7 (9)
Weekly	85.7 (6)	14.3 (1)	0.0 (0)	14.6 (7)
Occasionally	78.1 (25)	3.1 (1)	18.8 (6)	66.7 (32)

\* one tea glass=175 ml (approx.)

**Table 4. Alcohol drinking, its health impact on women; and husband's habit**

	Alcohol Consumption (%)		Total (%) (n=2397)	OR	95% C I	P Value
	Yes (n=397)	No (n=2000)				
<b>Pregnancy</b>						
Yes	15.0	85.0	5.0	1.2	[0.7, 2.0]	NS
No	17.3	82.7	95.0			
<b>Self reported Health problem</b>						
Yes	42.1	27.5	29.9	1.7	[1.4, 2.0]	<0.001
No	57.9	72.5	70.1			
<b>Alcohol uses by husband (n=2063)</b>						
Yes	86.4	33.8	42.7	12.4	[9.0, 17.2]	<0.001
No	13.6	66.2	57.3	4		

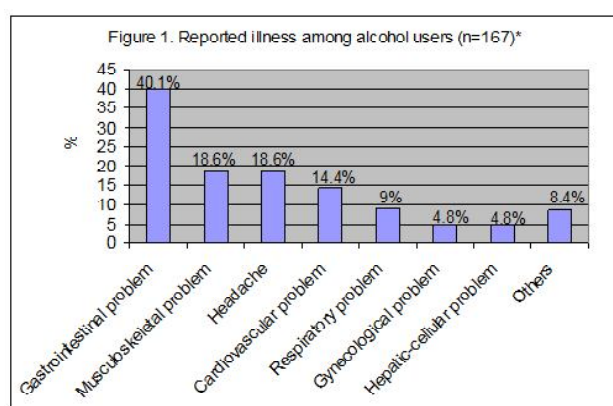
\*NS – Not significant



**Table 5. Final Logistic Regression; predictor variable of female alcohol consumption in Sunsari, (n=2397)**

Variables	Coefficient (SE)	P Value	OR	95% CI
Older age (vs. reproductive age )	0.35 (0.17)	0.038	1.40	[1.02-1.96]
Housewife (vs. businesswomen)	-0.69 (0.28)	0.015	0.50	[0.29-0.87]
Unemployed (vs. businesswomen)	-3.04 (1.05)	0.004	0.05	[0.01-0.38]
Major hill caste (vs. Hill native)	-0.92 (0.22)	<0.001	0.40	[0.26-0.61]
Major Terai caste (vs. Hill native)	-2.25 (0.23)	<0.001	0.11	[0.07-0.17]
Terai (vs. Hill native)	-1.44 (0.22)	<0.001	0.24	[0.16-0.36]
Other (vs. Hill native)	-1.16 (0.39)	0.003	0.31	[0.15-0.68]
Urban (vs. Rural)	-0.41 (0.20)	0.039	0.67	[0.45-0.98]
Alcohol users in family (vs. non users)	2.06 (0.17)	<0.001	7.84	[5.60-10.98]
Smoker (vs. non smoker)	1.26 (0.16)	<0.001	3.51	[2.58-4.79]
Tobacco chewing (vs. non user)	1.30 (0.18)	<0.001	3.66	[2.59-5.18]

-2 log likelihood = 1372.94 and Cox and Snell R Square = 0.28



\*Multiple responses

### Conclusion

The prevalence of alcohol use among the women was 16.6% in Sunsari, and it was significantly more in older age group than reproductive age. Separated or divorced women, illiterate, businesswomen, women belonging to hill native caste and Kirat religious women were at risk. 'Local Raksi', constitutes high concentration of alcohol was most popular drink. Mean age at first drink was around 21 years. The pregnant women who were taking alcohol were at high risk. Alcohol users were more likely to smoke and chew tobacco than non-users. Alcohol users were nearly two times to have health problem than the non-users [OR=1.7, 95% CI=1.4 to 2.0, P<0.001]. Awareness and effective program should be launched to discourage the excessive consumption of alcohol focusing specially to the pregnant women. It is also equally important to highlight the magnitude of the health hazard due to tobacco and alcohol, together as they were associated. Clinical health check up should be made among the alcohol user women to reveal the real health problems and its consequences.

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