

# Alcohol Consumption by School-Going Adolescents in Madagascar: Prevalence and Associated Risk Factors

Noeline Razanamihaja<sup>1,2\*</sup>, Befinoana<sup>1</sup> and Boylefevre Marie-Laure<sup>2</sup>

<sup>1</sup>University of Mahajanga, 401 Mahajanga, Madagascar

<sup>2</sup>Faculty of Dentistry, University Paris Diderot Paris 7, 5, Rue Garancière 75006, France

## Abstract

**Objectives:** The study was designed to provide estimates of alcohol use by school-going adolescents aged 12-18 years old in Madagascar and to identify risk factors associated with.

**Methods:** An analytical cross sectional study was conducted using the Global School-Based Health Survey questionnaire (GSBHS). The study used a self-completed questionnaire administered under confidential control in classroom. Sample was chosen by stratification. Participation in the study was seldom but the rate was high. For statistical analysis, the bivariate analysis used chi square test to assess differences and correlation between independent variables were undertaken.

**Results:** The logistic regression analysis of data found high proportion of first alcohol use with a mean of 69.1%. The study also showed an age-related alcohol use increasing with age. Rates were substantially higher among 12th class than among 8th class. Male students were more likely to report alcohol drinking than female. The gender difference is greater for spirits more likely used by male. Drinking rates differed also by urbanization. Greater difference existed in the prevalence of drinking in urban and suburban areas. Students in urban cities exhibited the highest rates. No association with parental alcohol drinking habit was found.

**Keywords:** Alcohol use behavior; Adolescents; Prevalence; Risk factors

## Introduction

The adolescents' alcohol abuse is an important public health concern because of its consequences on their adult age health. During the last decades, a growing number of adolescents started tasting alcohol at a very low age. Recognized as a public health problem, alcoholism became a subject of discussion; therefore, multiple measures have been taken by different organizations at international level. WHO, for instance, in an international report on alcohol and health, estimates that excessive alcohol consumption causes 9% of death among young people aged 15-29 years old. The extend of violence related to alcohol abuse among young people has also been highlighted [1].

Consequently, interests in the study of factors which can explain adolescent's attraction toward early alcohol consumption were developed. In 1990, a large investigation on the prevalence of the consumption of illicit products and alcohol among adolescents was carried out in many European countries. The results showed differences in consumption among countries and social groups, but the same investigation has reported the existence of periods of time of high consumption such as the week-ends, and the holidays. Furthermore, parents and TV shows also play important roles in the increase alcohol consumption among adolescents [2].

No such an inter-country study has been conducted for developing countries. Nevertheless, it is commonly agreed that, for instance, in many African societies, alcohol consumption takes a dominating place in people's habits and customs. Indeed, many social events are accompanied by alcohol.

Different kinds of industrial and local manufactured production of alcohol such as palm wine, coconut-made-alcohol named "trembo", sweetened alcohol of cane, a rum named "Toaka Gasy" or (TG), and many others are found on open sales in markets in Madagascar. Madagascar produces also a very popular malt liquor beer "Three

Horses Beer" [3].

Yet denounced by Medias many times, and despite the risks of wrong dosage or possible error in composition, the local fabrication of alcohol is growing rapidly, causing multiple health problems and deaths. Madagascar produces beer, wine, and distilled spirits.

Data on the prevalence of alcohol consumption among Malagasy people aged 15 years old and over is presented by WHO report in 2005 as being high but decreasing [1]. However, it was noticed that homemade alcohol is mainly produced, sold at cheaper prices, and consumed outside formal channels in villages.

Aimed at a promotion of a school program for reducing the prevalence of alcohol first consumption, the current study was mostly focused on school adolescents. The study was conducted at national level in 2007. The main objective was to describe the epidemiological patterns of alcohol consumption among school adolescents, and to identify the socio-economical factors related to them. The objectives were also to analyze individual factors related to behavior and habits risk.

**\*Corresponding author:** Noeline Razanamihaja, Faculty of Dentistry, University Paris Diderot Paris 7, 5, Rue Garancière 75006 France, Tel : 00-33-634-019-511; E-mail: [noelineraj@live.fr](mailto:noelineraj@live.fr), [rajabo.noeline@gmail.com](mailto:rajabo.noeline@gmail.com)

**Received** August 23, 2013; **Accepted** December 09, 2013; **Published** December 16, 2013

**Citation:** Razanamihaja N, Befinoana, Marie-Laure B (2013) Alcohol Consumption by School-Going Adolescents in Madagascar: Prevalence and Associated Risk Factors. J Alcoholism Drug Depend 2: 145. doi:10.4172/2329-6488.1000145

**Copyright:** © 2013 Razanamihaja N, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Participants and Methods

Socio-demographic characteristics of Madagascar: there are more than 20 million inhabitants in Madagascar among which 60% are below 25 years old, and 23% between 10 and 19 years old. Madagascar is among the countries with a demographic growth though the annual growth rate remains low (3%). The average age of the population is 17.5. Madagascar has a 5-4-3 formal education structure. Secondary school is divided into two cycles: lower secondary consists of grades 6 to 9, and upper secondary consists of grades 10 to 12. The secondary school net attendance is 25% for male and 26% for female. An analytical cross sectional study was conducted, using the Global School-Based Health Survey questionnaire (GSBHS). The GSBHS is a self-administered questionnaire developed by World Health Organization (WHO) and the Centers for Disease and Prevention (CDC) in collaboration with UNICEF, UNESCO and UNAIDS.

### Data collection

Formerly written in English, the questionnaire was translated into Malagasy then pretested, thereafter, some questions' formulation was changed to fit to Malagasy language and social concept reality. The study took place in the six biggest urban cities of Madagascar (Antananarivo (the capital), Antsiranana, Mahajanga, Toamasina, Fianarantsoa and Toliary). The target population was the school-going adolescents aged between 13 and 18 years old. Cluster stratification sample was applied. Schools in each city were randomly sampled from a list provided by school districts; thereafter, classrooms samples were chosen by randomization. In the chosen classes, all students who agreed to take part in the study completed the questionnaire themselves. The final sample expected was 750 students according to the lists received from the headmasters.

The questionnaire is concerned with students' health and what they do that may affect their health. In total 723 questionnaires were returned, among it 711 were fulfilled correctly.

The factors of study were: the demography (age, sex, grade, class), the student's alcohol consumption habits (first drink, alcohol beverage type, alcohol consumption for the last 30 days), the amount of monthly pocket money, sense of adaptation at school, school security feeling, hobby and parents' alcohol consumption behavior.

The data were processed and analyzed on computer with SPSS 14. Variables' proportion was calculated then compared, and differences were tested using chi square test. Multivariate analysis was processed with correlation test, and predicted variables were identified by logistic regression.

## Results

To the question: "how old were you when you tasted alcohol for the first time?" 62% of school-going adolescents have reported having already tasted alcohol, among which 27% have associated it with tobacco. The average age for first time of alcohol drinking was 12.5 years old (Table 1). Furthermore, one student aged between 15 and 18 years old out of ten asserted having already been drunk at least once during the last 12 months. Drinking increases with age. For most of those who are aged between 12 and 13, drinking is occasional. Half of those aged 15 and over reported having drunk at least once a week.

The results reported differences in alcohol consumption among cities. In the capital (Antananarivo) as well as in Toamasina, adolescents were twice as many to declare having already tasted alcohol than in the others cities.

| Factors                        | index               | % of those who had first alcohol consumption |
|--------------------------------|---------------------|--|
| Target population              |                     |  |
|                                | Have tasted alcohol | 61,9   |
| Class level (age group)        | Alcohol + tobacco   | 27,0   |
|                                | 6e – 4e (12-15 yrs) | 52,46  |
| Gender                         | 3e (16-18 yrs)      | 73,76***                                     |
|                                | Female              | 54,7   |
| Age group                      | Male                | 69,5***                                      |
|                                | 13-14yrs old        | 47,9   |
|                                | 15-16yrs old        | 67,1   |
| Urbanization                   | 17-18yrs old        | 74,7***                                      |
|                                | urban               | 64,4***                                      |
| Amount of pocket money         | suburban            | 50,7   |
|                                | few                 | 57,0   |
|                                | middle              | 69,8   |
| Time spend watching TV         | high                | 94,3***                                      |
|                                | low                 | 61,9   |
|                                | medium              | 59,2   |
| Time spend watching videos     | many                | 71,0*  |
|                                | low                 | 52,7   |
|                                | medium              | 74,5   |
| Feel safe at school            | many                | 76,2***                                      |
|                                | always              | 64,1   |
|                                | sometimes           | 47,8   |
| Bored at school                | rarely              | 68,9***                                      |
|                                | always              | 82,0*  |
|                                | sometimes           | 62,4   |
| Contact with friends at school | rarely              | 60,1   |
|                                | easy                | 55,3   |
|                                | medium              | 66,8   |
| Out with friends               | hard                | 72,3***                                      |
|                                | very often          | 71,0***                                      |
|                                | often               | 65,3   |
|                                | rarely              | 49,3   |

**Table1:** Prevalence of first alcohol consumption according to different factors (%).

| Alcohol consumption frequency | Gender         |                 |         |           |         |         |
|-------------------------------|----------------|-----------------|---------|-----------|---------|---------|
|                               | M              |                 |         | F         |         |         |
|                               | Local beer (%) | Rum (spirit)(%) | TG(%)   | Bière (%) | Rum (%) | TG (%)  |
| Never                         | 12,0           | 69,7            | 76,8    | 19,6***   | 86,4*** | 87,9*** |
| Rarely                        | 71,4           | 27,4***         | 19,5*** | 72,9***   | 11,6    | 9,6     |
| Monthly                       | 12,9***        | 2,9***          | 3,7***  | 4,9       | 2,0     | 2,5     |
| Weekly                        | 3,3            |                 |         | 4,5***    |         |         |
| Daily                         | 0,4            |                 |         | 0,9***    |         |         |
| Total                         | 100,0          | 100,0           | 100,0   | 100,0     | 100,0   | 100,0   |

**Table 2:** First tested Alcohol beverage types and frequency according to gender.

### Socio-demographic contexts and alcohol first use

The results showed male adolescents are significantly more likely to drink alcohol than female adolescents ( $p < 0.001$ ). Besides, differences were found between age groups. Indeed, older adolescents, aged 15 years old and over, were significantly more likely to report drinking alcohol beverage than younger adolescents ( $p < 0.001$ ).

Differences were also found on the level of urbanization. Higher proportion of adolescents who reported having taken alcohol was found in urban area than in suburban ( $p < 0.01$ ) (Table 1).

No significant difference was found regarding family environment (parents who drink alcohol, parents' level of education). However, the results showed a significant difference among the proportions of adolescents who drunk according to the amount of pocket money available to them, and those whose parents are reported to be smokers ( $p < 0.05$ ).

Students who like to spend much time watching TV or videos films, and those who love going out with friends were significantly more likely to drink alcohol, respectively at  $p < 0.05$ ,  $p < 0.001$  and  $p < 0.001$ . Compared to the students who declared being smokers of cigarettes, non smokers were less likely to use alcohol: 57.5%.

### School environment and alcohol first drinking

Alcohol first consumption was reported higher among students who said not enjoying school much, not feeling safe at school ( $p < 0.001$ ), and bored at school ( $p < 0.05$ ).

Besides, students who were in easy contact with others, or those who were not satisfied with their current life and those who often felt lonely, reported having tasted alcohol beverage at high percentage.

### Type of first consumed alcohol

Beer constituted the most frequent alcohol beverage tested among girls ( $p < 0.001$ ), whereas boys were many more to test crude spirits (industrial or local-made: example of Toaka Gasy, a crude rum made from rice and sugar-cane ( $p < 0.001$ ) (Table 2).

| Regular alcohol consumption | Gender     |            | Total      |
|-----------------------------|------------|------------|------------|
|                             | Male (%)   | Female (%) |            |
| no                          | 289(83,3)  | 334(91,8)  | 623(87,6)  |
| yes                         | 58(16,7)   | 30(8,2)    | 88(12,4)   |
| Total                       | 347(100,0) | 364(100,0) | 711(100,0) |

$p = 0.002$

**Table 3:** Regular alcohol consumption by gender.

### Regular alcohol consumption

The prevalence of regular alcohol drinking is 12.4%; is twice higher for boys (16.7%) than girls (8.2%) at  $p < 0,002$  (Table 3). The rate grows with age groups, respectively 7.7% (at 13-14yrs old), 9.4% (at 15-16yrs) and 24.9% (at 17-18yrs). ( $p = 0.000$ ) Differences were found between urban and rural areas and according to towns: the highest prevalence of regular alcohol drinking was found in the capital Antananarivo, then in Toamasina and Fianarantsoa respectively at 19.3%, 116.6% and 12.2%.

In table 4 the results of multivariate analysis by logistic regression are shown. A link was found between regular alcohol drinking and: male gender (OR=2,563; IC[1.389-4.731]), older age (OR=0.239; IC[0.112-0.509]), urbanization (OR=8.41; IC[2.349-30.106]), schoolchildren who find always school annoying (OR=0,165; IC[0.053-0.516]), and parents who used to drink daily (OR=3.694; IC[1.423-9.593]) (Table 4).

### Discussion

#### Alcohol first use and socio-demographical factors

The study has comforted the differences of alcohol consumption among adolescents regarding socio-demographical factors and sites. Social and cultural factors seem to drive adolescents risk-taking behaviors [4]. 12yrs old is the average age the initiation of alcohol beverage found in this investigation; it is, actually, earlier than the same age group of students in France during the same year of study, which is 13.4 [5,6]. Similar high rate of alcohol use was found by an inter-countries investigation, conducted in Man island in 2006, where 95% of students aged 15 years old have reported first alcohol use [7]. Compared with the prevalence of alcohol drinking in African countries, the Malagasy school going teenagers seems to be higher [8,9]. In 2004, Africapedia reported that among 15 years old and over, the alcohol consumption per capita was 1.38 liter in Madagascar, only 0.08liter in The Comoros, three times higher in The Seychelles (3.611) and in Mauritius (3.161) [8]. According to gender, in our study, boys drank more than girls; whereas in Europe, girls drink as much as boys [6].

Unlike other authors, our study did not reveal any alcoholic behavior of parents or level of education to significantly influence alcohol consumption of adolescents.

#### Impact of media and other hobbies

Favorite hobbies could become a danger factor. Adolescent who used to spend most of their free times watching TV or videos film, and who liked going out with friends were more likely to test alcohol than those who do it lesser. As reported by the literature [10-12], exposure to TV and videos impacts on adolescents' alcohol use. Also, our study has highlighted the fact that older adolescents who found school annoying were more inclined to drink. Indeed, literature also rose the following

| Factors                 | items     | Alcohol (OR) | p     | IC             |
|-------------------------|-----------|--------------|-------|----------------|
| Gender                  | M         | 2.563*       | 0.003 | [1.389-4.731]  |
|                         | -         |              |       |                |
| Age group               | 13-14     | 0.239***     | 0.000 | [0.112-0.509]  |
|                         | 15-16     | 0.246***     | 0.000 | [0.125-0.486]  |
|                         | -         |              |       |                |
| Urbanization            | urban     | 8.41         | 0.001 | [2.349-30.106] |
|                         | rural     |              |       |                |
| Find school annoying    | rarely    | 0.165        | 0.002 | [0.093-0.516]  |
|                         | often     | 0.275        | 0.034 | [0.084-0.906]  |
|                         | -         |              |       |                |
| Parents' drinking habit | Every day | 3.694        | 0.007 | [1.423-4.731]  |
|                         |           |              |       |                |

**Table 4:** Multivariate analysis using logistic regression on harmful predictive factors (OR).

factors push the youth to drink alcohol: lack of security, loneliness, lack of parental supervision (parents themselves consuming alcohol), familial situation [13]. However, being given the strong demography of young persons in Madagascar, harmful consequences of this practice on the health of the future adults will shortly be much more to fear.

Data on the prevalence of alcohol drinking habits among teenagers constitute indicators on important predicting factors of diseases and traumatism related to alcoholism. This data should also awake parents and teenagers' conscience and responsibilities for them to be in the mood for searching contribution to master and control these determinants which push teenagers to drink. The acute effect of alcohol abuse on individual health, on social life, and on family well-being is well known. Hopefully, it is worth noting that some measures taken by many countries such as the raising alcohol beverage prices seem to help controlling addiction [13].

### Advantages for oral health promotion school

These results are warning us on an urgent need to set up (plan) a school preventive program in order to inform schoolchildren of the deleterious effect of alcohol consumption on health and behaviors. The school program will be aimed to reduce the prevalence and age of first drink. Children spend considerable time at school and the school has a great potential to influence the oral health behavior. In school, we can reach a great number of children at early ages whose habits are being formed. Once informed, children may transmit the messages to their friends, sisters and brothers, parents and other people at the community level. The primary school lasts 5 years in Madagascar, which enables us to implement, supervise and evaluate preventive activities.

### Reliability and validity

For this study, a self reported questionnaire already tested in many other European countries and validated by WHO have been used.

The translation into Malagasy language induced some changes in the definition of some items, but most of the objectives of the study were gathered. The limits of the data based on questionnaire are well-known; a risk of underestimation of the frequency of consumption can be expected [14].

However, self reporting of consumption is the only means we have to evaluate the phenomena. Taking into account the problems in the questionnaire, efforts have been furnished to repeat some questions in different ways to estimate the reliability of the responses [15].

### Representativity and bias

Using stratified sampling methods allowed us to cover a large stratus of the population of school adolescent's living in urban and surrounded areas and the participation rate was high enough (96.4%) to validate the data.

### Acknowledgement

Grateful thanks to all survey assistants who participated in this survey and to all school headmasters for their assistance.

### References

1. WHO. Global status report on alcohol and health (2011). World Health Organization.
2. Reddy P, Resnicow K, Omardien R, Kambaran N (2007) Prevalence and correlates of substance use among high school students in South Africa and the United States. *Am J Public Health* 97: 1859-1864.
3. Atkin CK (1990) Effects of televised alcohol messages on teenage drinking patterns. *J Adolesc Health Care* 11: 10-24.
4. Bloomfield K, Grittner U, Kramer S, Gmel G (2006) Social inequalities in alcohol consumption and alcohol-related problems in the study countries of the EU concerted action 'Gender, Culture and Alcohol Problems: A Multi-National Study'. *Alcohol & Alcoholism* 41: i26-36.
5. Choquet M (2006) Consommation d'alcool parmi les jeunes en France et en Europe. *Bulletin Epidémiologique Hebdomadaire* 34-35: 261-266.
6. Legleye S, Le Nézet O, Spilka S, et al. (2008) Tabac, alcool, cannabis et autres drogues illicites. In : Godeau E., Arnaud C., Navarro F. (dir.). *La santé des élèves de 11 à 15 ans en France/2006. Données françaises de l'enquête internationale Health Behaviour in School-aged Children (HBSC)*. Saint-Denis : INPES, coll. Études santé, 2008 : 128-162.
7. Powell J, Plant M, Steriu A, Miller P (2006) Alcohol, tobacco, and illicit drug use among teenagers in the isle of Man. *Journal of substance use* 11: 1-9.
8. Alcohol consumption in Africa per capita among 15 year olds and above 2004. *Africapedia*.
9. Siziya S, Rudatsikira E, Muula AS (2009) Alcohol use among school-going adolescents in Harare, Zimbabwe: results from the 2003 Global School-Based Health Survey. *Tanzan J Health Res* 11: 11-16.
10. Robinson TN, Chen HL, Killen JD (1998) Television and music video exposure and risk of adolescent alcohol use. *Pediatrics* 102: E54.
11. van den Bulck J, Beullens K (2005) Television and music video exposure and adolescent alcohol use while going out. *Alcohol Alcohol* 40: 249-253.
12. Anderson P, de Bruijn A, Angus K, Gordon R, Hastings G (2009) Impact of alcohol advertising and media exposure on adolescent alcohol use: A systematic review of longitudinal studies. *Alcohol and Alcoholism* 44: 229-243.
13. Rehm J, Room R, Monteiro MG, Gmel G, Graham K, et al. (2004) Alcohol use. In: Ezzati M, Lopez AD, Rodgers A, Murray CJL, Editors. *Comparative quantification of health global and regional risks burden of attributable diseases on selected major risk factors*. WHO Geneva 1: 959-1108.
14. Anderson P, Baumberg B (2005) Rapport à la Commission Européenne. *L'alcool en Europe : une approche en santé publique*.
15. Johnson TP, Mott JA (2001) The reliability of self-reported age of onset of tobacco, alcohol and illicit drug use. *Addiction* 96: 1187-1198.