

## Alcohol consumption among high school students from the Araucanía-Chile: ethnicity and residence

### Consumo de alcohol en escolares de un territorio de la Araucanía-Chile: etnicidad y residencia

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#### Abstract

**Introduction:** This study describes the alcohol consumption in association with residence, gender and ethnicity among high school students from the coastal area of the Araucanía Region in Chile. **Subjects and Method:** Cross-sectional study on a population of 2,763 high school students aged between 14 to 18 years. Statistical analysis: exploratory-descriptive analysis was used for all variables and inferential statistical analysis for associations among variables using 95% confidence interval for the estimates and 5% statistical significance for the statistical test. Data collection: alcohol consumption reported by AUDIT test and sociodemographic records. **Results:** 48.1% of students were Mapuche, mean age of 15.7 years (SD = 1.2), mostly from rural areas (50.9%). Alcohol consumption in the last month was 38.2%; 39.6% male 36.7% female ( $p < 0.001$ ). 37.5% drank at least once in their life and 85% did so before age 15. 87% reported easy access to alcohol. According to AUDIT test, the levels of risk, harm and symptoms of dependence are 13.9% [95% CI: 12.6-15.2], 20.3% higher in men [95% CI: 18.2-22.5] than women 7.7% [6.4-9.3]. Mapuche students present risk consumption lower than non-Mapuche ones, 12.5% and 15.2% respectively. Urban-rural residence and risk consumption is 12.6% and 8.2% respectively ( $p < 0.001$ ). **Conclusions:** The alcohol consumption was higher than that observed at the national level, and as age increases, the level of risk increases, especially in men. Alcohol risk consumption was associated with ethnicity, place of residence and gender. The fact of being non-Mapuche, urban resident and man are factors associated with the risk of alcohol consumption among students.

#### Keywords:

Alcohol consumption;  
adolescents;  
students;  
Mapuche

## Introduction

Early alcohol consumption and intake among adolescents is a major public health problem due to at least three reasons: a progressive increase in drinking at an early age, an increase in the severity of the psychobiological damage in adulthood caused by drinking, and an increase in the subsequent costs of medical treatments<sup>1-3</sup>. Globally, follow-up studies in 25 countries indicate that more than 75% of young people aged 11-18 drink alcohol, and approximately 13% of them drink weekly<sup>4,5</sup>.

Internationally, public health policy efforts focus on preventing early drinking and risky consumption among adolescents. In this context, the WHO defines risky alcohol consumption as that which has harmful consequences for the drinker<sup>6</sup>. Among the associated factors with the risky consumption during adolescence have been identified early biological maturity, easy accessibility to alcohol, need for peer acceptance, lack of parental involvement, and poverty<sup>7,8</sup>. Early drinking is a risk factor for potentially dangerous behaviors such as accidents, unsafe sex, violence, family conflicts, as well as dropping out of school and limiting social opportunities for young people<sup>9,10</sup>.

In Chile, the drugs most commonly abused by adolescents between the ages of 12 and 18 are called licit drugs, namely, tobacco and alcohol. 80% of adolescents report having consumed alcohol at some point in their lives and 63% report having consumed alcohol at some point during the year. The latest national school survey conducted in 2015 showed a 35.6% of alcohol consumption among adolescents, with an increase in consumption among women. The consumption among men varied from 35.6% in 2013 to 34.2% in 2015, while among women it rose from 35.7% to 37.0% in the same period<sup>11</sup>. This consumption pattern among adolescents has changed in recent years when alcohol consumption was estimated to be five times higher in men than in women<sup>12</sup>.

Prevention of alcohol consumption among adolescents is still a public health challenge and is difficult to detect it at an early age, therefore, therapeutic and follow-up actions in this age group tend to be very complex<sup>13-16</sup>. The timely detection and investigation of risky consumption in young people pose a measurement challenge for public health, mainly due to reporting biases<sup>17,18</sup>. The WHO has recommended the Alcohol Use Disorders Identification Test (AUDIT) as an instrument that effectively detects consumption in the general and adolescent population<sup>19</sup>. This test is widely used by health teams to detect risky consumption and problem drinking in the population and has also been validated in our country for the adolescent population<sup>20,21</sup>.

Several studies indicate that young migrants and indigenous people are among the populations at risk of alcohol consumption<sup>22,23</sup>. The latest health in the Americas regional situation report<sup>23</sup> identified indigenous youth as a population at risk of alcohol consumption, for which there is little epidemiological information. In Chile, several studies on young indigenous population indicate an increased risk of depression, suicide, alcohol-related health problems<sup>24</sup>, and a drinking pattern associated with cultural ceremonies<sup>25,26</sup>. On the other hand, informal reports from traditional Mapuche authorities express concern about young people and alcohol consumption when they migrate to the cities to either look for work or continue their education<sup>27</sup>. However, in Chile, apart from the national survey of alcohol and drugs, there are no other studies on alcohol consumption among indigenous adolescents or schoolchildren, especially in the region with the largest Mapuche population in the country.

In La Araucanía Region, children are the first migrants from their Mapuche communities to small urban villages where they continue their studies at boarding schools. It is common for Mapuche children to migrate around the age of 12 to agricultural, technical or scientific schools located in small urban centers to complete their primary and secondary education<sup>28</sup>. Some of them, depending on the distance, travel daily from their homes to schools and others must stay in boarding schools and visit their families weekly.

Since 2015, the Regional Government of La Araucanía and the Universidad de La Frontera have initiated a pilot human development program which aims to improve the living conditions of adolescents and schoolchildren in the communes with the highest levels of poverty and Mapuche ethnicity in the region. In this context, there is a need to address the problem of alcohol consumption among students as a barrier that affects their full development, a problem for which there is no empirical evidence that allows the identification of the most vulnerable groups within the students themselves, nor to know if ethnicity is a factor associated with the risk of alcohol consumption.

La Araucanía Region is the setting for this study. It has a population of 869,535 inhabitants, 35% of them belong to the Mapuche people. 32% of the inhabitants of the region live in rural areas, and there are communes that have up to 89% of the Mapuche population<sup>29</sup>. In particular, the research covered the indigenous macro-territory of the coastal border of the region called Lafquenche (people linked to the sea), which is made up of four communes: Toltén, Carahue, Puerto Saavedra, and Teodoro Schmidt. It is characterized by a Mapuche population density between 60% and 89% and presents the most deteriorated socio-economic, education and development indicators in the region<sup>28,30</sup>.

This territory has an enrollment of 3,280 high school students distributed in 12 schools.

The objective of this study is to describe the level of alcohol consumption among high school students in the Mapuche Lafquenche macro territory of La Araucanía Region and its relationship with ethnicity, gender, and residence.

## Subjects and Method

Cross-sectional study of the student population between the ages of 14 and 18 who are in junior to senior year of high school in all the educational establishments corresponding to four of the communes of the Lafquenche macro-territory in La Araucanía Region: Tolten, Carahue, Puerto Saavedra, and Teodoro Schmidt. This design allows for a descriptive analysis of student alcohol consumption over a certain period, establishes some associations between student drinking and socio-bio-demographic conditions, and contributes to generating hypotheses for future research.

The study was carried out in the 12 schools in the above-mentioned communes, with a total enrollment of 3,280 students. Out of these, 181 students were excluded due to they were under 14 or over 18 years of age. Out of the 3,099 eligible students, 2,763 of them agreed to participate after signing the informed consent form (89.2% acceptance rate). 10.8% of the population that did not participate in the study were divided into the following causes: medical leave (2.9%), transfer to schools outside the communes under study (53.9%), school dropouts (33.9%), and repeated absences (9.2%). The schools were visited repeatedly in order to reach those students who were absent, especially those on medical leave.

The data collection was carried out using a set of instruments divided into two parts: a) a form with a socio-demographic background such as age, gender, place of residence, and ethnicity (Mapuche - non-Mapuche); questions on self-reporting of alcohol consumption in the last month and age of first alcohol consumption; and perception of alcohol access among young people; and b) the AUDIT test to assess the various levels of alcohol consumption among students (22,23). The ethnic condition was triangulated with self-classification, surnames, and belonging to the Mapuche community. These factors of ethnic identification have been proposed by organizations of indigenous people of Chile (30). Data was collected in the classrooms and class schedules of the students with the approval of the principal, head teacher, and supervised by the research team.

The AUDIT is a self-administered test consisting of ten questions of structured format on a scale of 0-4,

where 0 is the absence of the condition and 4 is the most problematic condition. For example: "How often do you drink an alcoholic beverage? 0= Never 1= One or less times a month, 2= two to four times a month, 3= two to three times a week, and 4= four or more times a week". Subjects can score from 0 to 40 points, which represent the following four categories of consumption:

- 0-7 points. Zone I, low-risk consumption.
- 8-15 points. Zone II, risky consumption.
- 16-19 points. Zone III, harmful consumption.
- 20-40 points. Zone IV, alcohol dependence symptoms.

The data were stored in an Excel database and analyzed with Stata 13 software. The analysis included a descriptive exploratory stage of all the study variables in order to validate the database. With the validated database, a descriptive analysis of the socio-demographic characteristics of the participants was carried out in order to determine the representativeness of the subjects under study. 95% confidence intervals were used for prevalence estimations of consumption categories and for AUDIT-score averages. T-Student tests were used to compare averages between groups and z-tests for comparison of proportions; all hypothesis tests were constructed at a 5% significance level. Despite the fact that the entire population was considered eligible, an inferential analysis was performed because 10.8% of the population could not be reached.

The study was approved by the Scientific Ethics Committee of the Southern Araucanía Health Service; the will, confidentiality, and anonymity of the student were respected. Due to the importance of problem drinking timely diagnosis and its early prevention, the team recommended that each school initiate the post-study alcohol risk counseling, which was carried out after the study, between 2016 and 2017.

## Results

The socio-demographic characteristics of the 2,763 students (table 1) indicate that most of them, regardless of their ethnic background, gender or residence, are between 15 and 16 years of age, with a homogeneous age distribution by gender (49% female and 51% male). With regard to ethnicity, 48.1% of students reported being Mapuche and 51.9% non-Mapuche, a proportion that is maintained according to gender. The average age of Mapuche and non-Mapuche students was 15.7 years (SD = 1.2) in both groups. The place of residence of the students indicates that they come from the rural sector (56.2%) more than those of urban residence, the greater proportion of rural

students comes from Mapuche communities (76% vs. non-Mapuche 37.5%).

The consumption of alcoholic beverages reported by students for the last month was 38.2% (39.6 males, 36.7 females). 39.5% of students reported ever drinking in their lifetime, and 85% of them did so before the age of 15. 87% of all students responded that there is easy access to alcohol among adolescents and no restrictions at the time of alcohol purchase.

Regarding the results of the AUDIT test application with its original scores and levels (table 2), it shows that low-risk consumption (less than 7 points) was associated with being Mapuche, female, rural resident and of younger age. The difference by ethnicity increases as the category of risky consumption increases, for example, in the level of alcohol dependency, the proportion of non-Mapuche students with dependency is 1.5 times higher than that of Mapuche students (2.1% and 1.4%, respectively).

The relationship between AUDIT test and gender of the students showed that the low-risk consumption (0 to 7 points) in women was 92.2% compared to 79.7% in men ( $p < 0.05$ ).

With regard to the relationship between age and alcohol consumption, it shows that as age increases, the percentage of individuals at risk of alcohol consumption increases. For example, at the age of 18, 25.6% present risky or harmful consumption or dependence (AUDIT higher than or equal to 8). Also, this level of alcohol consumption increases by 11.7 percentage points from the age of 14 to 18. The AUDIT results according to the residence of the students showed that

**Table 1. Sociodemographic Characteristics of sample**

Characteristics	Mapuche		Non Mapuche		Total	%
	N°	%	N°	%		
Gender						
Male	627	47.2	729	50.8	1,356	49.1
Female	702	52.8	705	49.2	1,407	50.1
Age (years old)						
14	252	19	249	17.4	501	18.1
15	344	25.9	382	26.6	726	26.3
16	318	23.9	374	26.1	692	25.0
17	285	21.4	313	21.8	598	21.6
18	130	9.8	116	8.1	246	8.9
Residence						
Urban	313	23.6	896	62.5	1,209	43.8
Rural	1,016	76.4	538	37.5	1,554	56.2

the categories of risky consumption, harmful consumption or dependency, present significant percentage differences between students of rural and urban origin. This difference is maintained as the category of alcohol consumption increases, therefore, the percentage of students of urban residence was twice as the students in rural areas in the level of alcohol dependence, with 2.4% and 1.2%, respectively ( $p = 0.05$ ).

In order to generate evidence for designing eventual interventions, the AUDIT categories (table 3) were grouped into low-risk consumption (score  $\leq 7$  points) and risky consumption (score  $\geq 8$  points). 13.9% of students (95% CI: 12.6-15.2) presented risky consumption. We verified that ethnicity has a statistically significant association with alcohol consumption, with

**Table 2. Alcohol consumption based on risk levels from AUDIT- OMS according to ethnicity, gender, residence and age of students**

Sociodemographic variables	Risk levels of consumption							
	Low Risk Score 0-7		Risk Score 8-15		Harmful Score 16-19		Dependence Score > 20	
	N°	%	N°	%	N°	%	N°	%
Ethnicity*								
Mapuche	1,163	87.5	121	9.1	27	2.0	18	1.4
Non Mapuche	1,216	84.8	158	11.0	30	2.1	30	2.1
Gender ( $p < 0.05$ )								
Male	1,081	79.7	191	14.1	44	3.3	40	2.9
Female	1,298	92.2	88	6.2	13	0.9	8	0.7
Residence ( $p < 0.05$ )								
Urban	999	82.6	152	1.6	29	2.4	29	2.4
Rural	1,380	88.8	127	8.2	28	1.8	19	1.2
Age (years) ( $p < 0.05$ )								
14	471	94.0	27	5.4	1	0.2	2	0.4
15	671	92.4	40	5.5	8	1.1	7	1.0
16	576	83.2	86	12.5	13	1.8	17	2.5
17	478	79.9	84	14.1	22	3.7	14	2.3
18	183	74.4	42	17.1	13	5.3	8	3.2

\*NS al 5%.

**Table 3. Distribution of grouped risk's levels of alcohol consumption (AUDIT) according sociodemographic variables of students**

Variables		Risk levels of consumption AUDIT				
		Low Risk (score < = 7)		Risk (score > = 8)		IC 95%
		N°	%	N°	%	
Ethnicity (p < 0.05)	Mapuche	1,163	87.5	166	12.5	[10.7-14.3]
	Non Mapuche	1,216	84.8	218	15.2	[13.3-17.1]
Gender (p < 0.05)	Male	1,081	79.7	275	20.3	[18.1-22.4]
	Female	1,298	92.3	109	7.7	[6.4-9.1]
Residence (p < 0.05)	Urban	999	82.6	210	17.4	[15.2-19.5]
	Rural	1,380	88.8	174	11.2	[9.6-12.8]
Age (years) (p < 0.05)	14	471	94.0	30	6.0	[4.0-8.4]
	15	671	92.4	55	7.6	[5.7-9.7]
	16	576	83.2	116	16.8	[14.0-19.7]
	17	478	79.9	120	20.1	[16.9-23.5]
	18	183	74.4	63	25.6	[20.2-31.5]

male non-Mapuche students with urban residence having the highest risky consumption. This proves that prevention and promotion efforts must be targeted at non-Mapuche male students and of urban residency.

## Discussion

The findings of this study showed a higher prevalence of alcohol consumption in schoolchildren in Lafquenche territory than those observed at the national and regional levels<sup>11</sup>. The data pointed to differences according to Mapuche or non-Mapuche ethnicity, urban or rural residence or being female or male. The existence of alcohol consumption figures that are 2.6 percentage points higher than the national average, five percentage points higher than the national average for schoolchildren, and a high percentage of children who have consumed alcohol by the age of 15, gives sufficient evidence as an indicator of the need to develop actions to prevent alcohol consumption in the school population.

Most of the students felt that there is ease of access to the purchase of alcoholic beverages. This indicates a control gap in the alcohol sale to students and a lack of supervision in the prohibition of sale to minors under 18 years of age. This justifies the need to address certain gaps in access control across sectors<sup>31</sup>.

In addition, it highlights that, regardless of gender, ethnicity or place of residence, the proportion of students in risky consumption, harmful consumption or dependence categories increases with age, with a significant rise between the ages of 16 and 17. This means that already at this age students present a significant health problem, therefore, preventive actions should

be focused on earlier ages of adolescence and preferably on children. This situation is similar to that found at the national level, which indicates a high prevalence of alcohol consumption among young people in their final years of high school<sup>11</sup>. On the other hand, alcohol consumption among men is still higher than among women, with a higher difference in Lafquenche than that shown at the national level<sup>11</sup>. Although the focus of prevention may be on men, attention should be paid to the alcohol consumption among women demonstrated in the latest school survey<sup>11</sup>.

When AUDIT consumption levels were related to socio-demographic variables, it was found that risky or harmful consumption is three times more frequent in men than in women, and this difference is even greater in the category of alcohol dependence. In addition, the analysis according to age indicates that in males over 17 years of age the level of consumption is in the category of harmful and dependence. These adolescents, as the literature points out, are exposed to risks that affect the projections and opportunities of this age group in terms of education or work<sup>32</sup>. This phenomenon is more worrying in contexts that offer few opportunities for development, such as the territory under study<sup>28</sup>.

An important finding for La Araucanía is that ethnicity was relevant to AUDIT-risky consumption among adolescents, because non-Mapuche youth consistently showed higher alcohol consumption in all AUDIT categories, but especially in the level of dependence. The Mapuche ethnic condition is a positive factor among the studied students as they have lower alcohol consumption risk than non-Mapuche students.

The urban residence appears as an element related to risky consumption and alcohol dependence, which means that rurality is a protective factor of risky con-



sumption among adolescents. This finding may be related to some aspects of the country-city dynamics, for instance, most rural youth travel daily, or every weekend to their communities, and thus they must comply with bus schedules and contribute to family work.

One of the study challenges was to try to reach the totality of the enrollment register, for this purpose, repeated visits were made to the schools, and finally, an important participation of students in the study was achieved. At the same time, in order to reduce the response bias in the self-report of alcohol consumption, each class was visited in advance, ensuring anonymity in the answers, and answering questions of the students about the questionnaire.

This work is limited to a very particular territory of the country; however, the studied school population is so far the largest that has been reached in research on alcohol and adolescence in the region. In this context, the obtained information exemplifies the reality of a group of adolescents located in socially and economically vulnerable environments.

The findings point to the need to focus cross-sectoral preventive efforts on increasingly younger school populations, work with girls on the issue of drinking among women, and with urban adolescents who are more exposed to access to alcohol.

This is a study whose purpose was to describe a problem for which no territorial empirical data were available. In the future, it is expected that the motivations, mechanisms, and habits of alcohol consumption among adolescents will be further explored through the investigation of experiences that lead to the consumption of alcohol at an early age. At the time of finishing this work, the authors are carrying out a qualitative ethnographic study to obtain a more compre-

hensive approach to the problem from the experiences of the students themselves.

## Ethical Responsibilities

**Human Beings and animals protection:** Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

**Data confidentiality:** The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

**Rights to privacy and informed consent:** The authors have obtained the informed consent of the patients and/or subjects referred to in the article. This document is in the possession of the correspondence author.

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Authors state that no economic support has been associated with the present study.

## Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

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