



RESEARCH ARTICLE

REVISED Consumption of traditional alcoholic beverages in children from a rural village in Northern Peru, 2017 [version 2; peer review: 1 approved, 2 approved with reservations]

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Abstract

Introduction: Alcoholic beverages have a proven impact on neuronal development and other areas of the body, primarily the heart, kidneys and liver, which is why their consumption in children is prohibited. However, there are traditional drinks that have alcohol content (Chicha de Jora-Clarito); artisanal drinks of traditional origin with alcoholic content in Peru. The aim of this study was to characterize the consumption of traditional alcoholic beverages in children of a rural village in Northern Peru.

Methods: This study was an analytical cross-sectional study. Mothers were recruited by census sampling and reported the consumption by their children of two traditional drinks with alcoholic content: Chicha de Jora (Ch) and Clarito (Cl), which are derived from the fermentation of maize. The frequency of consumption, accessibility and perception of consumption risk were described.

Results: Data were collected about 300 children, 61% (183) of whom consumed Ch. and 31% (92) of whom consumed Ch and Cl. Regarding drink accessibility, the majority of mothers said that these drinks were cheap (Ch: 69.0% and Cl: 60.7%). Additionally, the vast majority of families sometimes consumed or always consumed such beverages (Ch: 81.3% and Cl: 65.7%). One in three mothers perceived Ch and Cl as being nutritious and helping their children grow. 25% of mothers perceived that there was no risk to their children from the consumption of the beverages, whereas >60% said that there could be a risk due to the beverages' alcohol content.

Conclusions: Our study found that traditional beverages containing alcohol are consumed frequently by children in a village in Northern Peru. Mothers provide accessibility to the beverages and perceive the risk the drinks have, which will more accurately evaluate this risk. We advise that future studies concerning the intervention of these

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Any reports and responses or comments on the article can be found at the end of the article.

attitudes are performed, for a better future and development of children.

Keywords

Alcohol, Children, Health Problems, Peru

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REVISED Amendments from Version 1

This version has been revised according to the suggestions sent by our reviewers. These suggestions are focused on:

- Improvement in definitions and conceptualization of the origin of artisanal drinks of Peruvian origin (Chicha de Jora and Clarito).
- Improvement of the writing and correction of typing errors.
- And finally, improving the writing of percentages in the Discussion and Results sections, for a better and clearer understanding.

On behalf of the authors, we thank you for your interest and we present the improved version.

See referee reports

Introduction

Alcoholic beverages, which are traditionally derived from the fermentation of sugars and yeast¹, currently have a large socio-economic impact. The World Health Organization states that 3.3 million deaths are caused every year worldwide by the harmful use of alcohol². It is well known that these types of drinks cause a series of physiological problems (renal, digestive, hepatic, etc.)^{3,4}, as well as behavioral problems, which include maladaptation to the family and social environment, and, in extreme situations, could lead to suicide⁵.

According to worldwide data, alcohol use has 5.1% comorbidity (high blood pressure, cirrhosis, renal disease, etc.) in the age group between 20–39 years⁶. However, some countries, such as Colombia and Argentina, have reported onset at an earlier age⁷. In Peru, there is almost no information on this subject (information that is provided is mostly provided by local institutions); however reports show that the median age when alcohol consumption begins is 13 years, while in locations where children have greater access to alcoholic beverages, consumption starts at 10 years⁸.

Chicha de Jora (Ch) and Clarito (Cl) are drinks derived from the fermentation of maize that have been consumed since Pre-Hispanic times throughout the northern coast of Peru. The Incas, among the types of corn that they cultivated considered the germinated corn (Jora) as a sacred drink; giving two derivatives of alcoholic content (Chicha de Jora and Clarito). This tradition has been passed from generation to generation until today. Currently, the elaboration of this millenary drink in Peru (especially in the North Coast) is done by hand, not having a formal regulation by the industry⁹; thus reaching about 28.7% of unregistered alcohol registered by the World Health Organization (WHO)¹⁰, since consumers despite having between 10 to 12 degrees of alcohol, they consider this as a traditional drink¹⁰.

Consumption is high due to their low production cost, ease of access, and tradition¹¹. These factors can create a problem if such drinks are consumed by children and teenagers. The objective of this study was to characterize the consumption of these traditional alcoholic beverages in children of a rural village in Northern Peru.

Methods

Design and study population

A cross-analytical cross-sectional study was carried out between February and May 2017, in which the mothers and/or guardians of the Northern Peruvian settlement of “La Piedra”, where 308 children under the age of 15 reside, were surveyed. Household visits were completed for the purposes of the study. Thanks to the information provided by the governor, the surveys were carried out in each of the homes of the mothers and/or guardians using census sampling. A sample size was calculated for a descriptive study, for the local population of children, with a statistical power of 99%, a 95% confidence level and a maximum prevalence of 50%. A minimum sample of 300 children was obtained; this was captured non-randomly.

All mothers residing in the populated center (small town) during the interview were included. Mothers who did not wish to participate in the study, as well as those mothers who responded inadequately to our survey were excluded. After reading through the informed consent and agreeing to participate the mothers were enrolled in the study. Those who did not respond adequately to the survey (unanswered questions and/or incomplete answers) were excluded. Rate of rejection = 2.5%, thus achieving a total of 300 surveys applied, obtained from the interview of 103 mothers or guardians (in some cases the mothers or guardians had more than one child).

Survey design

For the present study, a survey was carried out, which was previously validated by a pilot study in a sample of 50 individuals, where a Cronbach’s alpha of 0.781 was obtained. The previous pilot study was not published, the results were only for the evaluation of the survey. The survey had minor modifications after the pilot study. These were used to specify the details of consumption, access and even the consequences of the consumption of alcoholic beverages. The final survey had two main sections ([Supplementary File 1](#)):

Socio-demographic data: Basic data was provided, such as the child’s age, weight, height and school grade, and in addition the number of household members and household income.

Characteristics of drinking habits in liquids/beverages: These characteristics were evaluated through closed questions, in which inquiries were made about the daily consumption of different drinks, primarily the consumption of beverages containing alcohol (Ch and Cl). The following information was obtained: the frequency of consumption (1 day a week; 2 days a week; Every day; No consumption), the accessibility of beverages (Very low cost - less than S/.1 Sun/Bottle; Low cost - less than S/.5 Soles/Bottle), whether or not consumed by the person who responded to the survey and by the whole family, and if the consumption of the beverages was perceived as harmful or nutritional for the child’s health. Finally, other exploratory variables were captured, such as the consumption of other types of beverages (aerated beverages, pure water, milk, lemonade, Chicha Morada, etc. - all of them without alcohol content); and a section where the child’s socio-academic problems were assessed was included. These exploratory variables are not discussed in the present study.

All surveys were anonymous and were conducted by a researcher belonging to the study. The approximate duration of the survey was 20 minutes. At all times the assigned researcher was properly trained to be able to solve doubts about any of the questions.

Data analysis

For the data analysis, a double digitizing system (data processed by two researchers separately, and then checked for errors manually) was performed, for a better control of the data collected. Surveys were entered in the Microsoft Excel program (version 2015), then proceeded to make a first filter for checking the data. Following this, the data were processed in Stata 11.1 (StataCorp LP, College Station, TX, USA).

For descriptive statistics, we worked with frequencies/percentages for categorical variables, and medians and interquartile ranges for the quantitative variables. The chi-square statistical test was applied for the association of the consumption of the drinks versus the perception that the consumption of the drinks could be bad for children. P<0.05 was considered statistically significant.

Ethical statement

Permission and support was provided by local authorities (governor, health center doctor and school director). Since children were the target of this study, all precautions were taken to ensure anonymity and respect for ethical precepts. The study was approved by the Ethics Committee of the San Bartolomé National Hospital, endorsed by the National Health Institute (NIH; approved March 5, 2016; Office No. 422). This committee was chosen since there is no committee that monitors the approval of the NIH where the study was conducted. This committee also approved the pilot study. The ethical standards on human experimentation of the Declaration of Helsinki of 1975 were taken into account. The results will be given to the sanitary authorities of the region, so that they can learn about this reality and put forward strategies

of help. The study was carried out under the permission of the mothers/guardians, who gave written informed consent.

Results

Data were collected about 300 children, 51.3% (154) were girls, and the median age was 9 years (interquartile range: 5–12 years). 15.8% (41) studied at an initial level, 53.5% (139) studied in a primary school and 30.7% (80) studied in secondary school. 61.0% (183) and 30.7% (92) consumed Ch and Cl, respectively (Table 1).

Most of the mothers reported that they consumed Ch (84.7%) and Cl (62.7%) when they were children, and the majority also consume the drinks now (Ch: 74.0% and Cl: 47.7%). Regarding accessibility of the beverages, the majority of mothers said that these drinks were cheap (Ch: 69.0% and Cl: 60.7%), and the vast majority of families sometimes consumed or always consumed such beverages (Ch: 81.3% and Cl: 65.7%) (Table 2).

35% of mothers perceived that Ch is nutritious and helps growth, while 33% and 35% of mothers perceived that Cl is nutritious and helps growth, respectively (Figure 1). 25% of mothers perceived that there was no risk for their child to consume the beverages. However, >60% said that there could be a risk due to the alcohol contained in the drinks (Table 3).

Figure 2 shows that although women perceive consumption of beverages as bad for their children, 46% and 34% still gave their children Ch and Cl, respectively.

Dataset 1. Raw data from the responses of mothers/guardians concerning their children’s consumption of traditional alcoholic beverages (n=300 children)
<http://dx.doi.org/10.5256/f1000research.12039.d170158>

Table 1. Consumption of traditional alcoholic beverages in children from a rural village in Northern Peru (n=300). Quantitative values are presented in median (interquartile range).

Beverage	Child consumption, n (%)	Consumption frequency, per week	Consumption initiated, years
Chicha de Jora	183 (61.0)	3 (1-7)	3 (2-5)
Clarito	92 (30.7)	3 (1-7)	4 (2-5)

Table 2. Accessibility of traditional alcoholic beverages to children from a rural village in Northern Peru (n=300).

	Chicha de jora, n (%)	Clarito, n (%)
Mother's consumption		
Consumed as child	254 (84.7)	188 (62.7)
Consume currently	222 (74.0)	143 (47.7)
Accessibility		
Thought to be cheap	207 (69.0)	182 (60.7)
Family consumption		
<i>Never</i>	56 (18.7)	103 (34.3)
<i>Sometimes</i>	175 (58.3)	159 (53.0)
<i>Always</i>	69 (23.0)	38 (12.7)

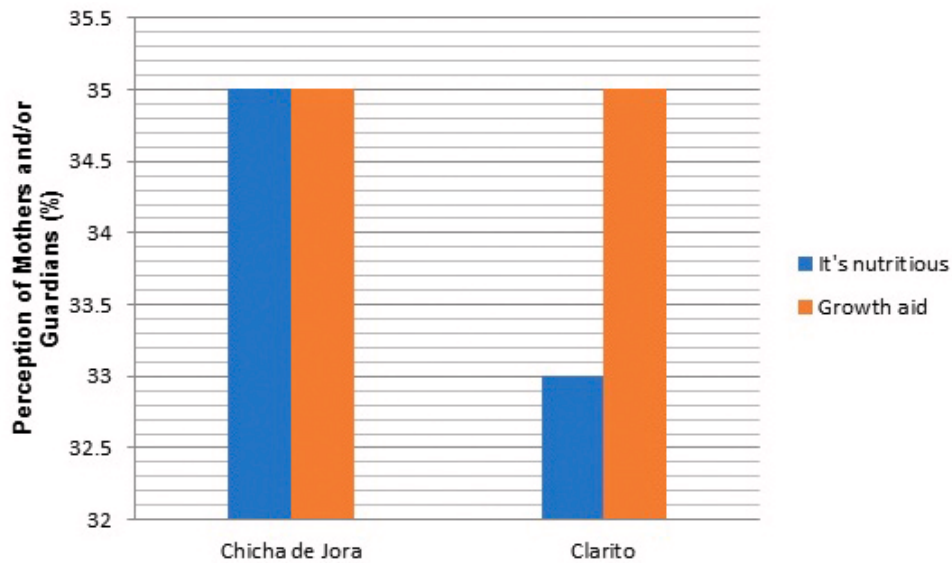


Figure 1. Mothers' perceptions of nutrition and aid for growth provided by traditional alcoholic drinks consumed by children.

Table 3. Perception of risk of traditional alcoholic beverages for children of a rural village in Northern Peru (n=300).

	Chicha de jora, n (%)	Clarito, n (%)
Health benefits		
Not dangerous	59 (25.8)	56 (24.8)
Dangerous	Not dangerous (0)	Not dangerous (0)
Reasons for danger		
Alcohol content	145 (63.3)	150 (66.4)
Religion forbids it	6 (2.6)	0
Does not help knowledge	3 (1.3)	3 (1.3)
Decreases intelligence	3 (1.3)	3 (1.3)
Other	13 (5.6.)	14 (6.1)

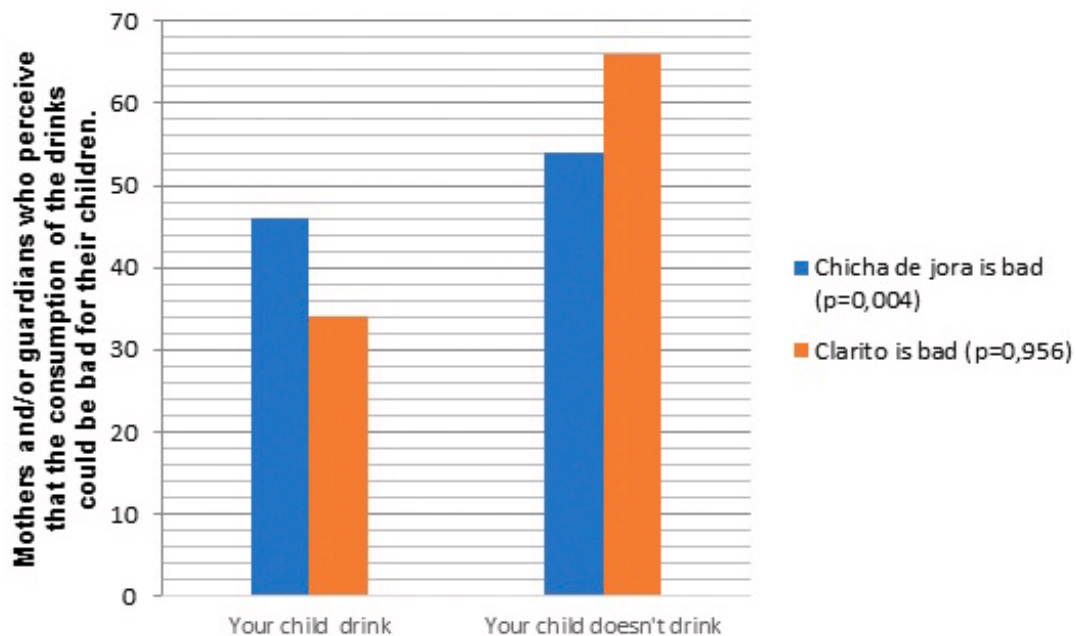


Figure 2. Percentage of consumption of alcoholic beverages among mothers who perceived that drinks could be bad for their children.

Discussion

The consumption of alcohol in children is still a very important problem, as evidenced in this study, where out of 300 children surveyed, 183 and 92 children consumed Chicha de Jora (Ch) and Clarito (Cl), respectively, every week. These results of consumption are greater than in different studies from different countries. For example, in Brazil, only 12.8% of children consumed any type of alcoholic beverage before age 10¹²; in the Province of Buenos Aires, 55.4% of adolescents between the ages of 11 and 14 consume alcohol¹³; while a study in Colombia, with children at the mean age of 14.4 years, concluded that the pattern of alcohol abuse measured by the CAGE scale was 14.6%¹⁴.

The consumption of these traditional beverages also occurred during the mothers' childhood, with a majority stating that they had consumed both drinks. Many of the mothers expressed that they still consume them. A report of a population study in Chile, of 408 alcoholic respondents, reported that 27.2% lived with children in the house and in 46.3% of cases the drinker was either the father or the mother¹⁵. Another report in Angola showed that 56% of mothers of 319 children had regular alcohol habits. Our study showed that this percentage was higher at 84.7% of mothers who consume Ch and 62.7% who consume Cl¹⁶. Also in Brazil, Argentina, Colombia, Chile, and Mexico, it was reported that occasional consumption of alcohol is associated with family context, influence of friends, antisocial behavior, and skills and experiences already acquired in childhood, which could be circumstances that encourage the consumption of alcohol in children^{12-14,17,18}.

The consumption of alcohol in younger populations has risen in recent years in Peru, which has the potential to cause harm and create addictive behavior¹⁸. In our population, the acquisition of

Ch (69.0%) and Cl (60.7%) was considered economical-average cost: 1 to 5 Soles / Bottle (0.80 Euros)- because of their low cost of production; therefore making them more accessible and frequently consumed. One in every three mothers perceived that the Ch and Cl are nutritious and help the growth of their children, and this is a perception that could lead them to giving these drinks to their children. A study from Spain reported that fathers and mothers do not consider their children's alcohol consumption to be a problem¹⁹, thus increasing their early intake without restriction.

In the present study, most mothers knew about the risk of alcohol consumption by children. However, it was observed that the consumption in most of their children remained high. Studies carried out in Spain and Cuba indicate that the family can be a protection, but also a risk factor. In both cases, the maternal figure tends to have a positive influence on the child, which differs from what was found in the present study^{19,20}. We can infer that this is mainly due to a socio-cultural characteristic where the community (and especially the mothers) view the consumption of these traditional alcoholic beverages as normal.

The study had the limitation of selection bias, since it was completed in a sample that does not represent the total population of Peru. Likewise, since this is a preliminary study, its non-quantitative nature also counts as a limitation. However, this study used census-type sampling in a population that had not been previously reported; therefore, these results can be taken as preliminary. In particular, these findings can be used to alert the responsible authorities, so that detection and support measures can be implemented, so that families in this village and similar locations with similar consumption conditions can receive the necessary support.

Conclusions

According to the present study, it is concluded that children consume traditional alcoholic beverages and that their mothers provide access. Although mothers perceive the risk that these drinks have, they still give them to their children. Finally, there could be a danger to health, however, further studies would be necessary in a quantitative manner, which would more accurately assess this risk.

Data availability

Dataset 1: Raw data from the responses of mothers/guardians concerning their children's consumption of traditional alcoholic

beverages (n=300 children). doi, [10.5256/f1000research.12039.d170158](https://doi.org/10.5256/f1000research.12039.d170158)²¹

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

Supplementary material

Supplementary File 1: Survey for mothers/guardians relating to the consumption of traditional alcoholic beverages in their children. This survey is provided in Spanish and English.

[Click here to access the data.](#)

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Reviewer Report 26 November 2018

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Maria Neufeld 

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The study provides very interesting and valuable insights into a topic, which is still very under-researched. However, I would recommend including some changes to improve clarity and flow of the manuscript and also to help settle the conclusion, as for now, it is not entirely clear where exactly the “health danger” is coming from and what exactly is problematic about the observed behaviours.

1. Please think of introducing further keywords to your article to make it more accessible/easier to find for an international readership. I would advise on including the key words “unrecorded alcohol” and “alcohol drinking”, for instance.
2. In the abstract please clarify what exactly you mean with “the majority of mothers said that these drinks were cheap (Ch: 69.0% and Cl. 60.7%).” It took me a while to understand what exactly you mean with the numbers and I finally got it with the help of Table 2, which indicates that these percentages relate to the question whether the mothers/legal guardians consider these drinks to be cheap. So I would suggest to rephrase the abstract a bit: “the majority of mothers said that these drinks were cheap (69% considered Ch. to be cheap and 60.7% considered Cl. to be cheap). The explanation of what was meant with cheap should appear already in the introduction or the methods section and not in the discussion section.
3. I fear that I do not fully understand what you mean in the discussion when saying “In our population, the acquisition of Ch (69.0%) and Cl (60.7%) was considered economical-average cost: 1 to 5 Soles / Bottle (0.80 Euros)- because of their low cost of production; therefore making them more accessible and frequently consumed.” --> so what do you say here and how does this, again, relate to the perception of these beverages as being cheap?
4. Please clarify whether there is a difference between the two traditional drinks Ch and Cl in terms of alcohol content or any other property that might be of interest/importance. For now the manuscript states that both beverages are derived from fermentation of maize, have an alcohol content of about 10-12% and that Cl is slightly cheaper (?). Is there anything

else the readership should know? Please add some ideas to the discussion section why you think the consumption of CI was less frequently reported than consumption of Ch and why CI was perceived as less nutritious. The international readership is not familiar with these two beverages and it would be good to get an idea of their differences, after having read the text.

5. It would be good to have some clarity on certain terms.

- For instance, please use the term “unrecorded alcohol” instead of “unregistered”, especially when referring to the WHO definition.
- Also please use the term “affordability”, when describing and discussing the prices of the beverages. Accessibility, at least in my view, rather relates to the question of physical access of the children to alcohol, specifically the questions whether mothers/guardians were given the alcoholic beverages to the children or not. So please separate the two terms for better clarity.
- Please be very clear that you always refer to mothers AND guardians in the manuscript, unless you talk about consumption of the different beverages in the family, which is a different indicator according to your questionnaire. You might want to introduce a footnote or an abbreviation at the very beginning. For now, the terms “mothers” and “mothers and guardians” are used inconsistently throughout the text.

6. Please double-check what was already raised by another reviewer: --> Table 3: check values for line “dangerous”. Is this logical that both are “0”? The table is a bit confusing the way it is, maybe you could rearrange for better readability.

7. When citing the Global Status Report on Alcohol and Health of the WHO, please refer to the newest one from September 2018 and please also update the numbers you cite from [the report](#)¹.

8. Also, I do not quite understand why you cite some indicators from the GSRAH on comorbidities in the age group of 20-39 years old. How does this relate to the subject of your study? You look at a much much younger cohort, so citing evidence from the same age group would be more appropriate here. Moreover, I do not understand why you cite comorbidities here. The way I see it, the GSRAH provides much more important indicators: for instance the percentage of total deaths attributable to alcohol, by age group for the WHO region of the Americas (Fig 4.17 of the report). If there’s something that should be cited from the GSRAH, then definitely this, highlighting how alcohol is impacting on mortality relatively early in life. Also, the report provides a country profile for Peru, which could be also helpful for the authors, e.g. for the estimate of the share of unrecorded alcohol consumed in Peru (however, there’s nothing specific on young drinkers in it besides prevalence of heavy episodic drinking in the age group 15-19, which is not really helpful for this contribution).

9. Please be clear with what you mean “It is well known that these types of drinks cause a series of physiological problems” (Introduction, 3rd sentence). The way it is put, it sounds very ambiguous, allowing for the conclusion that traditional alcoholic drinks cause problems, which would not have occurred if these were industrial alcoholic beverages. The authors should be very clear on where they stand here. For now, the evidence (Rehm et al.,

2013) shows that the most harmful ingredient of unrecorded alcohol is ethanol and that traditional/homemade alcoholic beverages are generally of the same quality as industrially manufactured alcoholic beverages and that their harm stems rather from the cheap price and broader availability and according drinking patterns rather than chemical properties.

10. When discussing alcohol consumption of young people (in the introduction and the discussion) in the introduction, please refer either in the introduction or the discussion to some literature on the early age at onset of alcohol use and subsequent risk of developing an alcohol use disorder. I'm not an expert in the field, but these are the studies that come to my mind immediately:

- Hingson, R. W., Heeren, T., & Winter, M. R. (2006)²
- Grant, B. F., & Dawson, D. A. (1997)³

11. The following sentence of the introduction was very confusing to me:

"Currently, the elaboration of this millenary drink in Peru (especially in the North Coast) is done by hand, not having a formal regulation by the industry; thus reaching about 28.7% of unregistered alcohol registered by the World Health Organization (WHO), since consumers despite having between 10 to 12 degrees of alcohol, they consider this as a traditional drink)."

What is it the authors intend to say here? I do not quite understand how the different statements relate to each other. Just because something is a traditional alcoholic drink, it does not mean that it automatically belongs to the category unrecorded alcohol (again, please use the term "unrecorded" and not "unregistered" here). There are plentiful examples where the industry is producing alcoholic beverages that were/are traditionally homemade/handmade. Also please think twice about your statement of "formal regulation by the industry". Is industry really the ones, who should be regulating this? What about the role of the government and public health in this? I would advise in being very careful in the way you argue here, as for now, the sentence suggests that the traditional beverages are somehow worse than industrially produced beverages or, at least, one can read those sentences like this.

Also, please update the share of unrecorded alcohol in Peru. According to the newest WHO report, it is 19.1% for the latest available period (2016).

12. Please provide a bit more context and references to the claim: "Consumption is high due to their low production cost, ease of access, and tradition." Unfortunately, I could not access the according reference for this sentence (11) to see to what source of information you refer here. Also, do you mean by "ease of access" physical availability of Ch. and Cl. and/or other factors, for instance the possibility to purchase these products when the local shops are closed at certain days/times? Further, you argue that "These factors can create a problem if such drinks are consumed by children and teenagers." Please be more specific with what exactly you mean here. There are certain reasons why these drinks are consumed by children. Besides cheap price and higher availability (is it?) and the belief that these drinks are beneficial for the children's growth, the legal minimum age for purchasing alcohol seems to another very important factor, which should be mentioned here explicitly.

13. The methods section should mention that this study was basically a household study and the limitations section should mention all the biases that naturally comes with assessing alcohol consumption in household surveys in general: selection bias (you did not ask children living in institutions, for instance), recall bias (mothers/guardians might forget how often they actually drink these beverages), social desirability bias and potential stigma of consumption (should be at least discussed whether this applies here or not) and so forth... Also, the methods and limitations section should explicitly mention and discuss the fact that children were actually not asked directly about their consumption and that the survey was done with mothers/legal guardians as proxies. It also should be mentioned/described how the interview situation exactly looked like and whether the children were present during the interview or not and how this could have influenced the results.
14. The methods section states that "all mothers residing in the populated center (small town) during the interview were included", indicating that the sample was a census. What exactly does this sentence mean, however? Does it mean that mothers of the entire town were interviewed? Or of the city center only? I'm a bit confused by the choice of words here. If only mothers/legal guardians from the city center were included, please discuss what implications this might have in terms of representativity of the results.
15. Physiological indicators (weight and height of the children) were included, but not reported in the results section. Could the authors please kindly comment on that and decide whether they want to perform the analysis for these indicators or not. If these indicators are included, please report on whether these were collected through objective measuring or self-report by the mothers/guardians. If the latter is the case, please discuss the biases coming with this type of assessment.
16. Was there any kind of additional information available on the indicator/questions "Could it [the consumption of a certain drink] be bad for you"? Does "the bad for you" refer to the mothers/guardian OR the child? If it refers to the mother/guardian, was there any kind of question that was asked for the child?

I think it would be quite important to know how this "bad for you" is conceptualized by the authors and perceived by the interview partners. In table 3, the authors talk about "the perception of risk" of the mothers/guardians and then the binary variable of "dangerous"/"not dangerous". I wonder if it is justified to present this as risk perception and the outcomes as dangerous/not dangerous, if the original question asked very vaguely if consumption "is bad or not". So far, I didn't get the grasp of what the mothers/guardians were actually thinking about this concept. For instance, based on the information provided in table 3, the mothers/legal guardians seem to be aware of the fact that these drinks contain xy% of alcohol and that alcohol poses certain risks for the child's development. However, my impression is that there is a certain discrepancy between the questionnaire and the ways the results are presented in terms of risk perception (e.g. that "bad for you" is something else than "dangerous"). Please report if there was already some clarity on that from the pilot, how the "bad for you" is related to risk perception. Maybe you even did some qualitative interviews in the pilot to understand how the risks are perceived by the mothers/legal guardians?

17. I think Figure 1 could be extended and include also the information of how many mothers/guardians thought that consumption of Ch. and Cl. is bad for them [again, based on whether this indicator was valid for the children or the mothers/guardians].
18. Please make sure that the titles of the tables/figures are consistent, e.g. the tables feature additional information on the sample size and study location and the figures do not.
19. Would be helpful, if Table 1 would feature some more information/broader definitions on "reason for danger"- e.g. what exactly does it mean "Does not heal knowledge"?
20. Figure 3 should report p values according to the F1000 article guidelines.
21. The second sentence in the discussion section states that "These results of consumption are greater than in different studies from different countries. For example,...". Please make absolutely sure that you are comparing your results with the results of similar studies from other countries, i.e. with studies that have specifically measures consumption of unrecorded and traditional alcoholic beverages in children. I do not think that it is appropriate to compare your study with studies that were measuring consumption of recorded alcoholic beverages in children/youth. Basically, your results can be interpreted in a way that ¼ of the mothers/legal guardians did not perceive Ch. and Cl. as alcoholic beverages and therefore "bad for children". So if asked if their children consume alcoholic products, they would have said "no", although the opposite was the case. This simply means that you cannot compare your specific results to other studies if they were measuring something else and state that the children of your sample had a higher prevalence of alcohol consumption. However, this does not mean that you should omit comparisons with other studies from the Americas completely; it just means that one should compare apples with apples.
22. Please comment on the first reviewer's remark: "Discussion, last paragraph: please include the non-quantitative nature as limitation. Considering your comment that "the consumption of these traditional alcoholic beverages" is seen as "normal", is there at least some information how much of the beverages is consumed by the children?"
23. I would disagree with the claim that "since this is a preliminary study, its nonquantitative nature also counts as a limitation." This IS a quantitative study, using a quantitate survey as instrument and featuring descriptive statistics. It does not provide risk-assessment and, as outlined by the first reviewer, but saying that this as a not quantitative study is also not justified. So I would advise on naming the lack of data on quantitative intake as the actual limitation/feature of the preliminary nature of the study.
24. I am also a bit confused by the sentence "However, this study used census-type sampling in a population that had not been previously reported; therefore, these results can be taken as preliminary." I do not see the relation between census type sampling and the preliminary nature of the results. Of course, the study does not represent the entire population of Peru, but it fully represents the population of children living in household in this specific village. Therefore, it is representative of this specific village and might be representative of further villages of Norther Peru with similar characteristics. I do not see why these results should preliminary if talking only about this context.

25. Could you maybe be a bit more specific when saying “These findings can be used to alert the responsible authorities”. If I understand your finding correctly, the lack of awareness about the risks of alcohol for young people is one of the biggest issues in these communities. So I think it would be good to name this and some other issues specifically, as well as to write just one or two sentences what the authors think could be done/what kind of action is needed. I think that this could go onto the conclusion, where it should be stressed that a certain risk was identified in this study and that now, further research is needed to explore the dimension of this risk, as well as certain measures to tackle it.

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1. World Health Organization: Global status report on alcohol and health 2018. 2018.
2. Hingson RW, Heeren T, Winter MR: Age at drinking onset and alcohol dependence: age at onset, duration, and severity. *Arch Pediatr Adolesc Med.* 2006; **160** (7): 739-46 [PubMed Abstract](#) | [Publisher Full Text](#)
3. Grant BF, Dawson DA: Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: results from the National Longitudinal Alcohol Epidemiologic Survey. *J Subst Abuse.* 1997; **9**: 103-10 [PubMed Abstract](#)

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

I cannot comment. A qualified statistician is required.

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Qualitative assessment of unrecorded alcohol consumption and harm in clinical populations, alcohol policy research with a special focus on unrecorded alcohol

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 22 March 2018

<https://doi.org/10.5256/f1000research.15625.r32256>

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Dirk W. Lachenmeier 

Chemisches und Veterinäruntersuchungsamt (CVUA) Karlsruhe, Karlsruhe, Germany

The authors have adequately considered all my previous comments.

The paper could be further improved by an English language correction as some sentences are difficult to understand. For example:

"However, there are traditional drinks that have alcohol content (Chicha de Jora-Clarito); artisanal drinks of traditional origin with alcoholic content in Peru."

"Mothers provide accessibility to the beverages and perceive the risk the drinks have, which will more accurately evaluate this risk."

Some further minor corrections:

"thus reaching about 28.7% of unregistered alcohol": change unregistered to unrecorded (see WHO wording)

"since consumers despite having between 10 to 12 degrees of alcohol, they consider this as a traditional drink". Change "degrees of alcohol" to "% volume". It is also illogical why the content of alcohol would exclude the status as "traditional drink".

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Risk assessment of unrecorded alcohol

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 25 August 2017

<https://doi.org/10.5256/f1000research.13025.r24709>

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Paul Anthony Camacho López

Research department, Fundación Oftalmológica de Santander FOSCAL, Bucaramanga, Colombia

The article is interesting, but the presented analysis only is descriptive, losing the relevance and applicability. I suggest that Authors enlarge the analysis, which should evaluate the potential risk factors. The conclusion is adequate, but only they could describe the consumption of traditional alcoholic beverages.

The introduction is not enough to explain the problem compared to the use of alcoholic beverages. In the methods, authors should clarify the patterns of consumption, the frequencies of consumption per week or monthly. The data analysis only centered in the descriptive the mother's consumption (perceptions), accessibility and perception of risk, but they did not analyze the association or relation with child's age, weight, height and school grade, household income and number members.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Epidemiology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 16 Mar 2018

Martín Vilela, Antenor Orrego Private University, Trujillo, Peru

Dear reviewer, the requested changes have been made in the comments, in the same way, we communicate that this is a preliminary study and we take into account in a future study to consider data in associations, as well as associated factors.

On behalf of the Authors, very grateful

Competing Interests: No competing interests were disclosed.

Reviewer Report 31 July 2017

<https://doi.org/10.5256/f1000research.13025.r24666>

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Dirk W. Lachenmeier 

Chemisches und Veterinäruntersuchungsamt (CVUA) Karlsruhe, Karlsruhe, Germany

The authors provide a pilot study into the consumption of traditional alcoholic beverages in rural Peru. The article is interesting and novel as there is clearly a lack of data on unrecorded alcohol from South America. It is also quite disturbing to read that considerable alcohol exposure may occur in children.

The following revisions should be considered:

1. For the international reader the beverages Chicha de Jora and Clarito are almost unknown. Can some information about these beverages be provided as background? For example, are they similar to maize beers? What is the typical alcoholic strength of these beverages? Are they commercially and legally sold by some kind of artisanal small-scale industry, or are they illegally sold? Should they be considered as falling into the WHO category of “unrecorded alcohol” (see Rehm et al.¹ for definition).
2. The conclusion states that the products are providing “great danger” to health. While this

may be true, there is not much in the data that would allow for such a conclusion. The study appears to be non-quantitative in nature and the alcoholic strength of the product appears to be unknown. Hence no calculation of daily alcohol exposure can be made, which would allow for a quantitative risk assessment (such as by using the margin of exposure approach²). With the currently available data I would suggest to conclude that there may be a health hazard, but quantitative intake assessment as well as chemical characterization of the beverages would be necessary for risk assessment.

3. The introduction of the abstract is written in a rather vague fashion. "... traditional drinks that may have alcohol content". Are Ch and CI without alcohol available? This should be clarified.
4. Introduction, last paragraph. The reference 9 mentions "Chicora de Jora". Is this the same as "Chicha de Jora"? Reference 10 mentions "girl from Jora"? Are these translation mistakes? Are there any more reliable peer-reviewed references with background on the beverages than some theses? Can a link to the source of reference 10 be provided?
5. Methods, characteristics of drinking habits in liquids/beverages: what beverage is "gas"? Clarify that Chicha morada is non alcoholic.
6. Table 3: check values for line "dangerous". Is this logical that both are "0"?
7. Discussion, first sentence: Please provide percentages to make the values more easy to compare with the data from Brazil and Colombia.
8. Page 6, first line: please clarify where the consumption has risen (in Peru?)
9. Page 6, 4th line: "low cost of production". Please provide some comparison for the low cost. Are the alcoholic beverages cheaper than non-alcoholic alternatives such as milk or fruit juices?
10. Page 6, 1st paragraph, last line "no studies about consumption of alcohol and drugs by children". I wonder about this request and why this is seen as unfortunate. I would find it highly unethical to study alcohol and drug consumption in children, and I can predict that we will never see such a study. This sentence should be deleted.
11. Discussion, last paragraph: please include the non-quantitative nature as limitation. Considering your comment that "the consumption of these traditional alcoholic beverages" is seen as "normal", is there at least some information how much of the beverages is consumed by the children?
12. Conclusions: "it is concluded that children consume a large quantity of traditional alcoholic beverages". This conclusion appears to be not founded in the data. No quantitative measurements were conducted.

References

1. Rehm J, Kailasapillai S, Larsen E, Rehm MX, et al.: A systematic review of the epidemiology of

unrecorded alcohol consumption and the chemical composition of unrecorded alcohol. *Addiction*. 2014; **109** (6): 880-93 [PubMed Abstract](#) | [Publisher Full Text](#)

2. Lachenmeier DW, Kanteres F, Rehm J: Epidemiology-based risk assessment using the benchmark dose/margin of exposure approach: the example of ethanol and liver cirrhosis. *Int J Epidemiol*. 2011; **40** (1): 210-8 [PubMed Abstract](#) | [Publisher Full Text](#)

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Yes

Are sufficient details of methods and analysis provided to allow replication by others?

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Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Risk assessment of unrecorded alcohol

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Author Response 16 Mar 2018

Martín Vilela, Antenor Orrego Private University, Trujillo, Peru

Dear reviewer, the changes requested in the comments have been made.

On behalf of the Authors, very grateful

Competing Interests: No competing interests were disclosed.

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