







ORIGINAL

Cultural adaptation of a web-based intervention to reduce alcohol consumption among adolescents in northwestern Mexico: a pilot feasibility and acceptability study

Adaptación cultural de una intervención basada en web para disminuir el consumo de alcohol en adolescentes del noroeste de México: estudio piloto de factibilidad y aceptabilidad

Jesús Antonio Zamorano Espero¹ , José Manuel Herrera Paredes² , Luz Angela Reyes Ríos³ , Enrique Blancarte Fuentes² , Doriam Esperanza Camacho Rodríguez³ , Yadira Mateo Crisóstomo¹ 

¹Universidad de Guanajuato, División de Ciencias de la Salud e Ingenierías. Celaya, Guanajuato, México.

²Universidad de Guanajuato, Departamento de Enfermería y Obstetricia. Celaya, Guanajuato, México.

³Universidad Cooperativa de Colombia, Facultad de Enfermería. Santa Marta, Magdalena, Colombia.

Cite as: Zamorano Espero JA, Herrera Paredes JM, Reyes Ríos LA, Blancarte Fuentes E, Camacho Rodríguez DE, Crisóstomo YM. Cultural adaptation of a web-based intervention to reduce alcohol consumption among adolescents in northwestern Mexico: a pilot feasibility and acceptability study. Salud, Ciencia y Tecnología. 2025; 5:1863. <https://doi.org/10.56294/saludcyt20251863>

Submitted: 14-01-2025

Revised: 21-03-2025

Accepted: 01-09-2025

Published: 02-09-2025

Editor: Prof. Dr. William Castillo-González 

Corresponding Author: José Manuel Herrera Paredes 

ABSTRACT

Introduction: alcohol consumption is a public health problem, and the current prevalence of alcohol consumption among adolescents is reported to be 20,6 %, and 5,2 % have reported excessive alcohol consumption in the past month. In this sense, cultural adaptations of affective interventions for alcohol consumption could generate beneficial results for behavior change.

Objective: to culturally adapt a web-based intervention to reduce alcohol consumption among adolescents in northwestern Mexico and determine its feasibility and acceptability.

Method: a pilot study with a pre-experimental design (with one study group) and pre- and post-test measurements. Non-probability convenience sampling was used, comprising 13 high school adolescents. McKleroy's Map of Adaptation Process (MAP) was used to culturally adapt the Alcohol Alert intervention. A screening form was used to identify adolescent alcohol consumers, along with a form containing personal data and alcohol prevalence. A scale designed by the authors of this study was used to measure the feasibility and acceptability of the intervention.

Results: the emerging categories were; language, consumption scenarios, consequences, types of alcoholic beverages. On the other hand, when comparing the first measurement (pretest) with the second (posttest), favorable changes were identified in the decrease in alcohol consumption in adolescents (23,1 % vs 7,7 %).

Conclusions: the intervention turns out to be feasible, acceptable and culturally sensitive. Future studies should evaluate its effectiveness.

Keywords: Intervention; Adaptation; Alcohol; Pilot; Adolescents.

RESUMEN

Introducción: el consumo de alcohol es un problema de salud pública, y en población adolescente se reporta una prevalencia actual de consumo del 20,6 %, y 5,2 % en consumo excesivo de alcohol en el último mes. En este sentido, las adaptaciones culturales de intervenciones afectivas sobre consumo de alcohol podrían generar resultados beneficiosos para el cambio de conducta.

Objetivo: adaptar culturalmente una intervención basada en web para disminuir el consumo de alcohol en

adolescentes del noroeste de México y determinar la factibilidad y aceptabilidad de esta.

Método: estudio piloto con diseño pre-experimental (con un grupo de estudio) con mediciones pre y postest. El muestreo fue no probabilístico por conveniencia y la muestra estuvo conformada por 13 adolescentes de secundaria. Se utilizó el Modelo del MAP (Map of Adaptation Process “MAP” de McKleroy), para adaptar culturalmente la intervención Alerta Alcohol. Se utilizó una cédula filtro para identificar a aquellos adolescentes consumidores de alcohol, y una cédula de datos personales y prevalencias de consumo de alcohol. Para medir la factibilidad y aceptabilidad de la intervención se utilizó una escala diseñada por los autores de esta investigación.

Resultados: las categorías emergentes fueron; lenguaje, escenarios de consumo, consecuencias, tipos de bebidas alcohólicas. Por otra parte, al comparar la primera medición (pretest) con la segunda (postest) se identificaron cambios favorables en la disminución del consumo de alcohol en los adolescentes (23,1 % vs 7,7 %).

Conclusiones: la intervención resulta ser factible, aceptable y sensible culturalmente. En futuros estudios deberían evaluar su efectividad.

Palabras clave: Intervención; Adaptación; Alcohol; Piloto; Adolescentes.

INTRODUCTION

Adolescence is considered the stage of human development with the most changes, including physical, emotional, and social changes, as well as exposure to poverty, abuse, or violence. As a result, adolescents are one of the populations most vulnerable to different risky behaviors, such as alcohol consumption.^(1,2) This is considered a public health problem that causes 2,6 million deaths worldwide and more than 200 diseases, injuries, and other health-related disorders.⁽³⁾

In Mexico, the National Health and Nutrition Survey reported a current prevalence of alcohol consumption among adolescents of 20,6 %, with a higher percentage among males (22,0 %) than females (19,2 %). It should be noted that excessive alcohol consumption in the last month was 5,2 %, and that prevalence increased from 2018 to 2020. both for excessive consumption in the last year and in the last month, the percentages were higher among males (15,0 % and 6,1 %) than among females (12,7 % and 4,2 %).⁽⁴⁾ In addition to the above, alcohol consumption patterns at this stage are due to various factors: family, friends, cultural norms, religion, and the media. It is more common to be part of a group of friends, to feel good, to be able to let go of inhibitions, and to seek sensations and emotions that make them believe that it is a way of adapting to society.⁽⁵⁾

These factors play an important role in adolescents, as they determine a protective or risk role for their consumption, both in the family nucleus and in the school and community context, emphasizing that alcohol consumption is positively related to the consumption of their friends, siblings, and parents, making evident the important influence that the environment has on alcohol consumption in this vulnerable population.

Along the same lines, there are significant damages to individual health, social well-being, and social stability; adolescents who consume alcohol tend to have problems in school, such as lack of concentration and poor academic performance, as well as problems related to high-risk behaviors such as traffic accidents, unplanned pregnancies, and sexually transmitted infections.⁽⁷⁾

Therefore, intervention programs to prevent the consumption of addictive substances at an early age and reduce the likelihood of venturing into the use of other, even more harmful substances are considered to be of paramount importance. In this way, it is considered that the best way to address adolescent health-related problems is through intervention programs that encourage the development of prosocial behaviors to reduce or prevent risky behaviors, thus addressing problematic behaviors before they arise.

In this regard, Alcohol Alert is an intervention that originated in the Netherlands and has proven to be highly effective in reducing alcohol consumption among Dutch adolescents.⁽⁹⁾ Years later, it was replicated in Seville, Spain, where it also proved effective in reducing consumption among adolescents in that country.^(10,11) This intervention uses computer adaptation technology (web-based and computer-adapted) to adjust the content of the intervention to the specific characteristics of the target population through a digitized process.⁽¹²⁾

On the other hand, identifying and addressing the most relevant risk and protective factors for alcohol consumption allows for the development of appropriate behavior change strategies; however, these factors may vary across different societies, countries, or even communities within the same country, depending on different sociocultural determinants. Therefore, a local approach adapted to the needs of a specific community should be considered for behavior change.⁽¹³⁾

In Gitlin's words, effective interventions should be adapted and tailored to the specific needs and profiles of the target populations in a given local context.⁽¹⁴⁾ Therefore, the content of the Alcohol Alert intervention has been culturally adapted using the MAP Model, which indicates that eliminations or additions, modifications

to existing components, changes in the form or intensity of components, or cultural modifications required by local circumstances may be included.⁽¹⁵⁾ Therefore, the objective of this pilot study was to culturally adapt the web-based intervention to reduce alcohol consumption among adolescents in northwestern Mexico and to determine its feasibility and acceptability.

METHOD

Pilot study, pre-experimental (one study group), and longitudinal (with pre- and post-test measurements)⁽¹⁶⁾ in a sample of $n = 13$ adolescents from a public secondary school located in the municipality of Ahome, Sinaloa, Mexico. The sampling was non-probabilistic for convenience because it was limited to those adolescents who consumed alcohol.

With regard to the instruments, a filter form developed by the researchers was used to identify adolescents who consumed alcohol. Subsequently, a Personal Data and Alcohol Consumption Prevalence Form was administered, which included sociodemographic data such as gender, age, and academic grade, as well as questions assessing alcohol consumption situations in the last month.

The feasibility and acceptability scale for the intervention was developed by the lead author based on the acceptability scale by López et al.⁽⁸⁾ in order to evaluate the acceptance of the intervention program by adolescents and the extent to which it responded to the needs of this population, as well as to evaluate how feasible this intervention was for the participants. The questions seek information about the appropriateness of the number of sessions, frequency, duration, content, and aspects of the intervention sessions.

The cultural adaptation process is described qualitatively through the operationalization of the phases that make up the Cultural Adaptation Model for Behavioral Interventions proposed by McKleroy⁽¹⁵⁾ (figure 1).

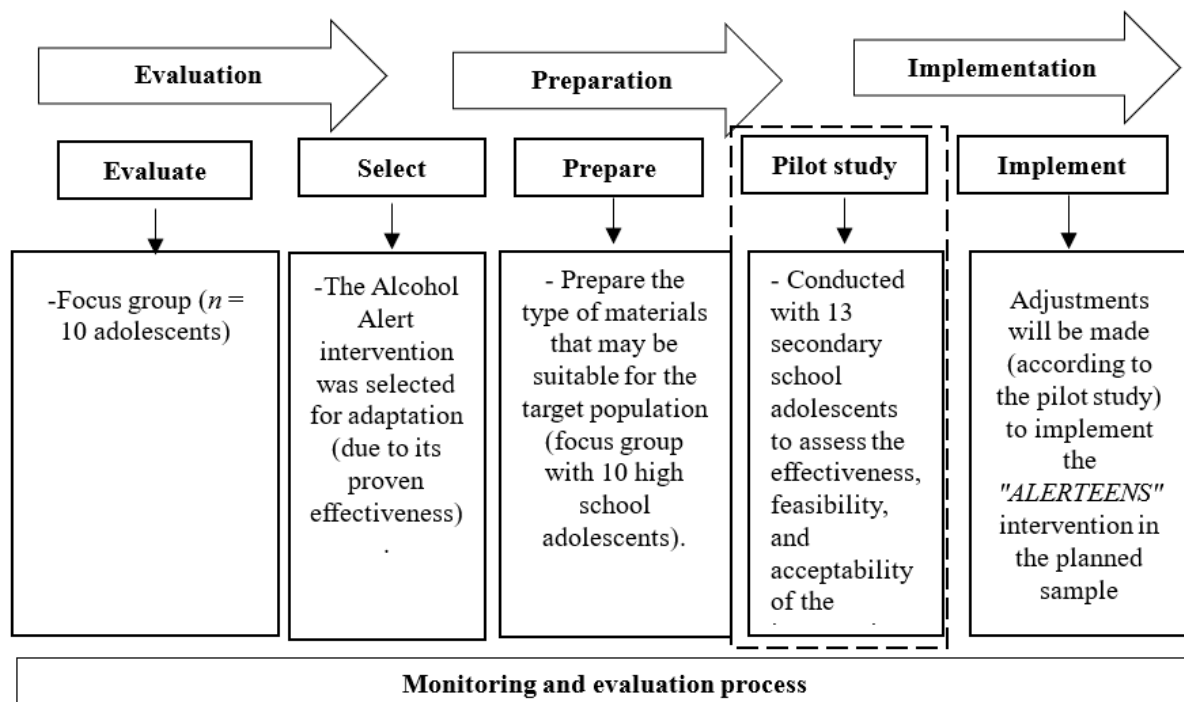


Figure 1. Intervention adaptation process

In accordance with the phases, qualitative techniques were used through focus groups, which allow for the investigation of knowledge and experiences, in which participants express their views on a specific topic in a permissive, comfortable environment that safeguards the confidentiality of the information.⁽¹⁷⁾

Phase 1. Evaluation

In this phase, 10 high school adolescents were invited to participate; the selection of the high school and participants was random. Simple random sampling was used because the schools have social problems related to alcohol consumption. Subsequently, a presentation was given on the relevant elements of the Alcohol Alert intervention that were being evaluated by the target population. Participants were also given the participant manual to read and analyze.

Consequently, a semi-structured guide was applied to identify content that could be modified according to the local context, where adolescents were asked for suggestions for adjustments regarding the duration of the sessions, the language, terms or phrases used (language), components (intervention content), and the

use of the website. These responses led to cultural adjustments in the local context, adapting the name Alerta Alcohol to ALERTEENS.

It should be noted that the information gathered supported the argumentation of those marked differences between the original context where the intervention was carried out and the context selected to culturally adapt the intervention through the elements that theoretically intervene in behavior change.

Phase 2. Selection

A literature search was conducted on interventions focusing on social skills, and the Alcohol Alert intervention was selected for adaptation due to its proven effectiveness^(11,18) compared to other interventions^(19,20) (table 1).

Authors	Program	Result
Martínez-Montilla, et al. ⁽¹¹⁾ 2020. Spain	Alcohol Alert	Experimental group: Reduced by 8,0 % (<i>OR</i> 0,716, <i>p</i> = 0,02). Control group 4,4 % (<i>OR</i> 0,821, <i>p</i> = 0,22)
Jander, et al. ⁽¹⁸⁾ 2016 Netherlands	Alcohol Alert	Effect sizes increased when 15-year-olds adhered to the intervention for longer (after 1 session: <i>OR</i> 0,41; after 2 sessions: <i>OR</i> 0,24; after 3 sessions: <i>OR</i> 0,22).
Conde, et al. ⁽¹⁹⁾ 2018. Argentina	Brief intervention	Experimental group <i>B</i> = -0,79 [95 % CI -0,9/-22], <i>p</i> = 0,0001. Control group <i>B</i> = -0,56 [95 % CI -1,09/-0,48], <i>p</i> = 0,0012.
Cutrín, et al. ⁽²⁰⁾ 2021 Spain	Mantente Real	(<i>d</i> =0,14; frequency of alcohol consumption <i>B</i> =-0,07; <i>p</i> < 0,05). Intoxication <i>B</i> = -0,07 <i>p</i> < 0,001.

Phase 3. Preparation

To prepare the materials, a focus group (composed of *n* = 10 high school adolescents) was again asked to participate in order to identify the type of material best suited to the target population. In addition, this phase also had the support of three experts with doctorates in nursing sciences and expertise in the use of legal and illegal drugs among adolescents, as well as experts in behavioral interventions, in order to obtain input that was relevant to the contextual adjustment of the intervention. The adolescents and experts shared their views on the website developed for the target population and the manuals (both for facilitators and participants). The purpose of this was to identify the significant elements or components that needed to be modified. It is important to mention that two of the experts were from the municipality of Ahome, Sinaloa (where the cultural adaptation took place), which favored the contextual adjustment of the intervention in the target population.

Phase 4. Pilot

Finally, the aim was to improve the content of the intervention as much as possible through the pilot study, which involved the participation of 13 secondary school adolescents to assess the feasibility and acceptability of the intervention. According to McKleroy⁽¹⁵⁾, the pilot study can be implemented with at least 10 participants.

It should be noted that, in all cases, the work carried out with the focus groups was done prior to the corresponding procedures at the educational institution where this research was conducted. Likewise, prior consent (from parents or guardians) and informed assent (from adolescents) were obtained, taking into account only those adolescents who voluntarily agreed to participate in the research and submitted their signed consent and informed assent in a timely manner so that their participation could be recorded.

Facilitator

To select the facilitator, a recruitment process was carried out under certain criteria: being a nursing professional with a master's degree in nursing science, having experience or knowledge in the subject of alcohol consumption, and having the ability to communicate with and manage adolescents, being outgoing, showing confidence, and being able to perform each of the activities favorably. The facilitator was recruited one month before the intervention by the researcher responsible for the study. Interested parties were given a questionnaire to determine their profile and contact information, and those who met the above characteristics were selected. The facilitators were then trained for one month, with two two-hour sessions per week. The sessions included workshops where the facilitator and participant manuals were explained in detail, as well as the content and use of the website.

Website

A systems engineer was brought in to help develop the website. Under the supervision of the lead researcher, the engineer transferred the content of the manual to a website. The engineer was also responsible for providing each of the adolescents with a username and password so that they could access the site. Avatars were designed—two for males and two for females (similar to the original intervention)—and the adolescents selected the avatar they wanted to personalize with their preferred name (available at: <http://www.ccelaya-dcsa.ugto.mx/alerteens/index.html>).

Intervention

The intervention consists of a short story in which the protagonist wakes up after a night of excessive drinking and cannot remember what happened. There are two different stories depending on the gender of the participants: one for boys and one for girls (however, they are very similar).

Table 2. Content of the Alcohol Alert vs. ALERTEENS sessions

Thematic content	Alerta alcohol	Objective	Time	Week
Initial session Pretest assessment	Initially assess the variables subject to change through the intervention and create records for the adolescents in the intervention program		60 minutes	1
Session No. 1 First scenario (at home)	Ensure that the adolescent is aware of the consequences and risks of alcohol consumption in adolescents to be applied in a simulated scenario.		60 minutes	2
Session No. 2 Scenarios two and three (celebrations, parties, and public places).	Teens should understand the role of self-efficacy, social influence, and th s of alcohol consumption in order to develop an action plan.		60 minutes	3
Session No. 3 Challenge and action plan	Have the adolescent design their action plan to reduce alcohol consumption based on the possible challenges that may arise.		60 minutes	4
Session No. 4 Challenge assessment	Have the adolescent evaluate the results of their action plan to reduce alcohol consumption and propose modifications.		60 minutes	5
Final session Post-test evaluation	Evaluate the variables subject to modification after the intervention to observe any changes.		60 minutes	6
ALERTEENS				
Initial session Pretest assessment	Initially assess the variables subject to change through the intervention and create records for the adolescents in the intervention program.		60 minutes	1
Session No. 1 Overview of perceived stress	Have the adolescent identify situations that cause stress in their daily life.		60 minutes	2
Session No. 2 Problem-focused coping (perceived stress)	Have the adolescent develop strategies that will help them cope with perceived stress.		60 minutes	3
Session No. 3 Language of emotions	Help adolescents recognize the emotional responses that develop during adolescence.		60 minutes	4
Session No. 4 First scenario (at home)	For the adolescent to learn about the consequences and risks of alcohol consumption in adolescents to be applied in a simulated scenario.		60 minutes	5
Session No. 5 Scenarios two and three (celebrations, parties, and public places).	Teens should understand the role of self-efficacy and social influence in alcohol consumption in order to develop an action plan.		60 minutes	6
Session No. 6 Challenge and action plan	Have the adolescent design their action plan to reduce alcohol consumption based on the possible challenges that may arise.		60 minutes	7
Session No. 7 Challenge assessment	Have the adolescent evaluate the results of their action plan to reduce alcohol consumption and propose modifications.		60 minutes	8
Final session Post-test evaluation	Evaluate the variables subject to modification after the intervention to observe any changes.		60 minutes	9

The stories take place in three different settings (at home, at celebrations, and in public places). Under these settings, the story is presented and personalized questions and messages are offered with the participants' names; elements such as repetition of the answer were used. The delivery mode was web-based, lasting 9 weeks, once a week, developed in the school's computer center (table 2).

Ethical aspects

This study complied with the provisions of the General Law on Research Regulations regarding health research, ensuring the confidentiality of the information and the anonymity of the participants at all times.

⁽²¹⁾ In addition, it was approved by the Research Ethics Committee of the Mochis School of Nursing under code CEI-054.

Data analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 25.0 for Windows. To evaluate the outcome variable (alcohol consumption), descriptive statistics were used through frequencies and percentages to compare the changes between the pre- and post-test scores. Likewise, the responses of the focus group and the expert group were analyzed qualitatively, classified, and integrated into different categories that gave rise to those elements of the intervention that were susceptible to modification.

RESULTS

Cultural adaptation was carried out based on similar responses between the focus group and the expert group, forming categories that were theoretically justified, providing a logical explanation for the findings (table 3).

Table 3. Results of Cultural Adaptation

Category	Justification
<p>Language - Adolescents</p> <p>The main words/phrases that caused confusion (were not understood) were those related to local terms such as:</p> <p>Language - Experts</p> <p>It is important that adolescents suggest words or terms that should be replaced in order to achieve understanding of the intervention message, such as cubata, binge drinking, and botellón.</p>	<p>Language is part of a human mental activity shared by different social and cultural contexts, which leads to a better understanding by members of the knowledge and skills essential for success in multiple functions of a particular culture.⁽²²⁾</p>
<p>Consumption scenarios - Adolescents</p> <p>Some consumption situations related to scenarios can be modified. Here, it is not so common for high school adolescents to consume alcohol at celebrations such as fairs or community days, since the sale of alcohol to minors is prohibited. It is more common for them to consume alcohol at the homes of friends or cousins.</p> <p>Consumption scenario - Experts</p> <p>It is essential to take into account the opinions of adolescents in the places where they normally consume alcohol. There may be adolescents who consume alcohol during the celebration of Mochis Day, but this is not very common.</p>	<p>Effective interventions are adapted and tailored to the specific needs and profiles of the target population and local contexts. In this sense, if the cultural aspects of a given community are taken into account, it is very likely that results similar to those of the original intervention will be found.⁽¹⁴⁾</p>
<p>Consequences - Adolescents</p> <p>The stories mentioned as part of the activities could be more intense in order to generate greater awareness. Consequently, , the consequences could be stronger in order to raise concern among adolescents.</p> <p>Consequences - Experts</p> <p>Alcohol consumption begins in adolescence, so it is adolescents who, based on their experience (those who have already consumed alcohol) or what they have seen in their family or friends, can say what consequences they consider important in order to raise awareness.</p>	<p>Judgments and intentions are determined based on the adolescent's knowledge and experiences regarding the harms and consequences of alcohol consumption. Consistent with this, scientific evidence shows that the greater the perception of risk, the lower the alcohol consumption.⁽²³⁾</p>
<p>Alcoholic beverages - Adolescents</p> <p>The preferred drink is beer; however, to reduce the taste of alcohol (bitter), women prefer drinks prepared with sweeteners (azulitos, micheladas).</p> <p>Differences in alcoholic beverages between men and women have been identified.</p> <p>Alcoholic beverages - Experts</p> <p>It is important to take into account the preferred drink reported by adolescents, but it is also important to consider drinks that are significant and common or popular in the local context.</p>	<p>In Mexico, beer ranks first as the alcoholic beverage of choice consumed by adolescents because it is easily available, widely advertised, and sold at low prices in many stores. In addition, it is considered a mild drink (with a low alcohol content) and is sold in various sizes. Likewise, spirits, canned drinks, and table wine are alcoholic beverages used to mask the bitter taste of alcohol and are commonly consumed more by women than men.</p>

Regarding the sociodemographic data of the study group participants, the average age of the participants was 14,31 years ($SD = 0,85$), 69,2 % were in their third year, 38,5 % reported being in a romantic relationship (having a boyfriend/girlfriend), 92,3 % reported that their father works, and 61,5 % of participants reported that their mother works.

On the other hand, to respond to the objective of determining the feasibility and acceptability of delivering the web-based intervention to reduce alcohol consumption, Tables 4 and 5 are presented.

Table 4. Feasibility of delivering the web-based intervention to reduce alcohol consumption in adolescents

	Insufficient		Moderately sufficient		Sufficient	
	f	%	f	%	f	%
1. The number of sessions was	-	-	5	38,5	8	61,5
2. The frequency of the sessions was	-	-	4	30,8	9	69,2
3. The duration of the sessions was	-	-	6	46,2	7	53,8
4. The duration of the intervention (all sessions) was	-	-	2	15,4	11	84,6
5. The intervention's ability to resolve my drinking problem was	-	-	2	15,4	11	84,6
6. The procedures used in the intervention were	1	7,7	2	15,4	10	76,9
7. The use of computers to carry out the activities was	-	-	5	38,5	8	61,5
8. The content of the sessions was	-	-	1	7,7	12	92,3
9. Overall, the benefit of the intervention on alcohol consumption is	-	-	-	-	13	100

Note: f = frequency % = percentage n = 13

Table 5. Acceptability of the web-based intervention to reduce alcohol consumption in adolescents

	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree	
	f	%	f	%	f	%	f	%	f	%
10. I like the program	-	-	-	-	-	-	5	38,5	8	61,5
11. I find the program useful	-	-	-	-	1	7,7	4	30,8	8	61,5
12. I am satisfied with the program	-	-	-	-	1	7,7	3	23,1	9	69,2
13. The program met my expectations	-	-	-	-	1	7,7	5	38,5	7	53,8
14. I would recommend this program to my friends	-	-	-	-	-	-	3	23,1	10	76,9

Note: f = frequency % = percentage n = 13

At the end of all sessions, 61,5 % considered the number of sessions to be “sufficient,” while 84,6 % considered the duration of the intervention (all sessions) to be “sufficient.” 84,6 % of participants considered the intervention's ability to resolve the drinking situation to be “sufficient.” It should be noted that 100 % considered the intervention's benefit on alcohol consumption to be “sufficient.”

Table 6. Prevalence of alcohol consumption in the last month and excessive consumption by gender, before and after the intervention

	Pre-test				Posttest			
	Yes		No		Yes		No	
Prevalence of alcohol consumption in the last month	f	%	f	%	f	%	f	%
Men	2	15,4	8	61,5	1	7,7	9	69,2
Women	1	7,7	2	15,4	-	-	3	23,1
Prevalence of excessive alcohol consumption in the last month								
Men	2	15,4	8	61,5	-	-	10	76,9
Women	1	7,7	2	15,5	-	-	3	23,1

Note: f = frequency % = percentage n = 13

In terms of the acceptability of the intervention, 61,5 % “strongly agreed” that they liked the intervention, with the same percentage (61,5 %) stating that they “strongly agreed” that the intervention was useful, and 69,5 % “strongly agreed” that they were satisfied with the program. It is worth noting that 76,9 % of adolescents said they would recommend this program to their friends.

With regard to the outcome variable, the present cultural adaptation favored a decrease in alcohol consumption among adolescents, in terms of prevalence in the last month and excessive consumption (table 6).

According to the findings, there was a decrease in alcohol consumption in both men and women (15,4 % vs. 7,7 %) in the last month, and in the case of women, none reported consumption in the post-test. Regarding excessive consumption in the last month, 15,4 % of men and 7,7 % of women mentioned excessive consumption in this prevalence in the pretest, a situation that improved in the posttest, as neither sex reported this type of consumption.

DISCUSSION

The objectives of this pilot study were to culturally adapt the web-based intervention to reduce alcohol consumption among adolescents in northwestern Mexico and to determine its feasibility and acceptability.

With regard to cultural adaptation, this was carried out in accordance with the recommendations of McKleroy's model⁽¹⁵⁾ for which focus groups were formed to obtain qualitative data that would allow the relevance of the adaptation to be identified and analyzed in accordance with the cultural context and population of interest. There is literature that almost systematically concludes that culturally adapting behavioral interventions makes them more effective and prevents the loss of key content due to issues related to language, culture, or values. Among the findings of this study are modifications made due to cultural differences related to local festivities, in which situations of consumption often arise that are not unfamiliar to the participants, given that, when presented in the original context, they seem strange and they do not identify with them.

Another important aspect to consider was the language and colloquial slang terms used in the original context and the local context of application. This coincides with Oneto's study⁽²⁵⁾ in which, with the aim of making the content more culturally sensitive to the target population, various modifications were made to the language and local terms used. In this sense, it is not only a matter of translation (in this case from Spanish from Spain to Spanish from Mexico), but also of modifications in terms of language, so that the words and proper names have an impact or relevance in Mexican culture when using the customary form of speech.

With regard to the ages of the participants, we worked with secondary school students aged 11 to 16, and a focus group of 10 adolescents was formed to work on the cultural adaptation phase (qualitative phase). Similar to what was reported in a study conducted in Monterrey, Nuevo León, Mexico where the sample consisted of secondary school adolescents aged 11 to 15, they also worked with 10 adolescents who participated in semi-structured interviews through a focus group for the cultural adaptation phase. It should be noted that alcohol consumption begins at these ages and, in some cases, continues as an expression of different social phenomena. On the one hand, it represents a problem and a risk, but it also plays a role in socialization processes and even in the transition to adulthood or in rituals, determined by the cultural context in which the adolescent is immersed.

In addition, the ALERTEENS intervention was found to be well accepted, responding to the needs of adolescents, and it is feasible to apply it in the same modality, number of sessions, content, and duration. This result is similar to that reported by Martínez-Montilla⁽¹¹⁾ since in the Alcohol Alert intervention, he found that 72 % of adolescents said the intervention was understandable, 63,1 % said it was useful, 68,8 % were satisfied with the program, 52,9 % would use the program again, and 62,8 % of adolescents would recommend the program to others.

Similarly, the study conducted by Salgado⁽²⁹⁾ reported that 52,1 % of adolescents liked the type of activities used in the sessions, 65,8 % considered that the program helped them develop more skills to avoid alcohol or substance use in the future, and 62,9 % of adolescents were happy or very happy with the program in general. These results may be due to the fact that the intervention is web-based, and adolescents are heavy internet users and therefore extremely attracted to technology. The dynamic format and interactive game are related to the age of the participants, as adolescents are more interested in online games than in activities to be performed. In addition, the literature indicates that the integration of interactive and game elements appears to be an essential prerequisite for any mental health program aimed at the adolescent population.^(30,31)

With regard to alcohol consumption as a result variable, this research favored behavioral change in terms of reduced consumption. This finding is consistent with the results of Ho's study⁽³²⁾ conducted on adolescents aged 12 to 15, which found that, after the intervention, fewer students in the intervention group reported drinking alcohol compared to the control group (9,8 % vs. 12,1 %). These consumption patterns could be explained by the normalization of consumption, easy access, and poor supervision of the sale and distribution of this substance, coupled with family permissiveness and adolescents' low perception of risk associated with this psychoactive substance. For this reason, there is a clear need to continue working with early and middle

adolescents (particularly those in middle and high school), since early onset of alcohol consumption can have significant repercussions on the physical, emotional, and social health of this vulnerable population.⁽³³⁾

CONCLUSIONS

ALERTEENS, the Mexican version of the Alerta Alcohol program, appears to be acceptable, sufficient, and culturally sensitive. The cultural adaptation process carried out with the support of the focus group and a group of experts made it possible to identify areas that needed to be modified so that the target population would feel familiar with the consumption situations, language, materials, activities, and delivery mode of the intervention.

Consequently, this intervention is feasible. According to the findings of this study, participants considered the number of sessions, content, and duration to be appropriate.

The acceptability of the ALERTEENS intervention is adequate, and a high level of participant satisfaction was found in this research study. Finally, the exploratory results are promising in terms of reducing alcohol consumption in the last month. For this reason, the ALERTEENS intervention is relevant to the Mexican context, offering nursing professionals, academics, and researchers the opportunity to replicate its adaptation and implementation in specific contexts to evaluate its effectiveness in addressing the problem of alcohol consumption among adolescents.

Among the limitations, it was possible to determine that the main evaluations were based on self-reports from participants and a group of experts, which may have a social desirability bias. On the other hand, future research should evaluate the effectiveness of the program in a larger sample, in older adolescents (where there is greater alcohol consumption), and for greater control, it is suggested to have a comparison group.

BIBLIOGRAPHIC REFERENCES

1. Durán Garzón GG, Naranjo Hidalgo WT. Habilidades sociales y consumo de alcohol de Ecuador. *Revista Psicología UNEMI*. 2024; 8(014): 52-64. <https://ojs.unemi.edu.ec/index.php/faso-unemi/article/view/1833/1739>
2. Organización Mundial de la Salud (OMS). Salud mental del adolescente 2021. <https://www.who.int/es/news-room/fact-sheets/detail/adolescent-mental-health>
3. Organización Mundial de la Salud (OMS). Alcohol 2024 <https://www.who.int/es/news-room/fact-sheets/detail/alcohol>
4. Ramírez-Toscano Y, Canto-Osorio F, Colchero MA, Reynales-Shigematsu L, Barrientos-Gutiérrez T, López-Olmedo N. Patrones de consumo de alcohol en adolescentes y adultos mexicanos: Ensanut Continua 2022. *Salud Públ. Méx.* 2022; 65:s75-s83. <https://saludpublica.mx/index.php/spm/article/view/14817>
5. Molina-Quñones H, Salazar-Taquiri V. Factores asociados al consumo de alcohol en adolescentes residentes en Lima, Perú. *Haban Cienc Méd.* 2022; 21(3):e4655. <http://www.revhabanera.sld.cu/index.php/rhab/article/view/4655>
6. Riquelme Durand GS, Huamani Cahua JC, Arias Gallegos WL. Habilidades sociales y consumo de alcohol en estudiantes de dos instituciones educativas de nivel secundario de la ciudad de Arequipa. *Rev. Psicol.* 2022; 12(1): 107-133. <https://revistas.ucsp.edu.pe/index.php/psicologia/article/view/1475>
7. Jiménez Padilla BI, Alonso Castillo MM. Revisión sistemática de intervenciones preventivas en ambiente escolar para el consumo de alcohol y tabaco en adolescentes. *HAAJ.* 2022; 22(1): 108-121. <https://doi.org/10.21134/haaj.v22i1.626>
8. López Saucedo MDR, Marsiglia FF, González Lizárraga MG, Arreola Romero FG. Factibilidad de un programa de preventivo del consumo de sustancia adictivas en estudiantes de secundaria de Sonora. *Reg. y Soc.* 2024; 36: e1878. <https://doi.org/10.22198/rys2024/36/1878>
9. Jander A, Crutzen R, Mercken L, de Vries H. A Web-based computer-tailored game to reduce binge drinking among 16 to 18 year old Dutch adolescents: development and study protocol. *BMC Public Health.* 2014; 14: 1054. <https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-14-1054>
10. Lima-Serrano M, Martínez-Montilla JM, Lima-Rodríguez JS, Mercken L, De Vries H. Design, implementation and evaluation of a web-based computer-tailored intervention to prevent binge drinking in adolescents: study protocol. *BioMed Central Public Health.* 2018; 18(449): 2-11. <https://doi.org/10.1186/s12889-018-5346-4>

11. Martínez-Montilla JM, Mercken L, de Vries H, Candel M, Lima-Rodríguez JS, Lima-Serrano M. A Web-Based, Computer-Tailored Intervention to Reduce Alcohol Consumption and Binge Drinking Among Spanish Adolescents: Cluster Randomized Controlled Trial. *J Med Internet Res*. 2020; 22(1): 1-23. <https://doi.org/10.2196/15438>
12. Lima-Serrano M, Barrera- Villalba C, Mac-Fadden I, Mesters I, de Vries H. Alerta Cannabis: A Tailored-Computer Web-Based Program for the Prevention of Cannabis Use in Adolescents: A Cluster-Randomized Controlled Trial Protocol. *BMC Nursing*. 2024; 23: 239. <https://doi.org/10.1186/s12912-024-01889-x>
13. Libuy N, Ibáñez C, Guajardo V, Araneda AM, Contreras L, Donoso P, Mundt AP. Adaptación e implementación del modelo de prevención de consumo de sustancias Planet Youth en Chile. *Rev. niño. neuro-psiquiatr*. 2021; 59(1): 38-48. <http://dx.doi.org/10.4067/S0717-92272021000100038>
14. Gitlin LN, Czaja SJ, Behavioral intervention research: designing, evaluating, and implementing. New York: Springer Publishing Company, 2016. <http://absysnetweb.bbtk.ull.es/cgi-bin/abnetopac01?TITN=547824>
15. McKleroy VS, Galbraith JS, Cummings B, Jones P, Harshbarger C, Collins C, Gelaude D, Carey JW. Adapting Evidence Based Behavioral Interventions for New Settings and Target Populations. *AIDS Educ and Prev*. 2006; 18 (4 Suplemento A): 59-73. <https://doi.org/10.1521/aeap.2006.18.sup.59>
16. Grove SK, Gray JR. Investigación en enfermería: Desarrollo de la práctica enfermera basada en la evidencia. (7ª ed.). 2019. México: McGraw-Hill Interamericana. <https://inspectioncopy.elsevier.com/2/es/book/details/9788491135111>
17. Pulido-Trujillo S, Jorge-Cárdenas X, Morales-Contreras NI, Peregrina-Martínez M. Consumo de drogas: percepción de padres y adolescentes. *Rev. Horiz. Sanit*. 2024; 23(1): 57-65. <https://doi.org/10.19136/hs.a23n1.5644>
18. Jander A, Crutzen R, Mercken L, Candel M, de Vries H. Effects of a Web-Based Computer-Tailored Game to Reduce Binge Drinking Among Dutch Adolescents: A Cluster Randomized Controlled Trial. *J Med Internet Res*. 2016; 18(2): e29. <https://doi.org/10.2196/jmir.4708>
19. Conde K, Brandariz RA, Lichtenberger A, Cremonte M. The Effectiveness of a Brief Intervention for Reducing Adolescent Alcohol Consumption. *Rev Cienc Salud*. 2018;16(3):409-423. <http://dx.doi.org/10.12804/revistas.urosario.edu.co/revsalud/a.7261>
20. Cutrín O, Kulis S, Maneiro L, MacFadden I, Navas MP, Alarcón D, Gómez-Fraguela JA, Villalba C, Marsiglia F. Effectiveness of the Mantente REAL Program for Preventing Alcohol Use in Spanish Adolescents. *Psychosocial Intervention*. 2021; 30(3): 113-122. . <https://doi.org/10.5093/pi2020a19>
21. Secretaría de Salud. Reglamento de la Ley General de Salud en Materia de Investigación para la Salud, México. 2014 http://www.diputados.gob.mx/LeyesBiblio/regley/Reg_LGS_MIS.pdf
22. Magallanes Palomino YV, Donayre Vega JA, Gallegos WH, Maldonado Espinoza HE. El lenguaje en el contexto socio cultural desde la perspectiva de Lev Vygotsky. *REVENCYT*. 2021; 54: 25-35. <https://revista.grupociieg.org/wp-content/uploads/2021/11/Ed.5125-35-Magallanes-Veronica-et-al.pdf>
23. Guerra E, Machado AM, González YA, Mesa M, Carrazana I. Percepción de riesgo del uso nocivo del alcohol y sus consecuencias en adolescentes. *Rev Multimed*. 2019; 23(4): 744-757. <http://scielo.sld.cu/pdf/mmed/v23n4/1028-4818-mmed-23-04-744.pdf>
24. Telumbre-Terrero JY, López-Cisneros MA, Castillos-Arcos L, Sánchez Becerra A, Sánchez-Domínguez JP. Historia familiar y consumo de alcohol en adolescentes. *Rev. Sal. Unin*. 2019; 35(1): 72-83. <http://www.scielo.org.co/pdf/sun/v35n1/2011-7531-sun-35-01-72.pdf>
25. Oneto P. Las Adaptaciones Culturales de un Programa de Intervención Familiar Basado en Evidencia con Población Latina. *EUREKA*. 2021;18(1):26-42. <https://ojs.psicoeureka.com.py/index.php/eureka/article/view/47/49>
26. Espinoza-Salgado FS, Robles García R, Wakefield CE, Kelada L, Sansom-Daly UM, McGill BC, Zentella Tusie A, Juárez García FL, Cárdenas Cardos RDS, Zapata-Tarrés M. Adaptación cultural mexicana del programa

de intervención CASCAdE para padres de supervivientes de cáncer infantil. *Psicooncología*. 2022;19(1):63-80. <https://dx.doi.org/10.5209/psic.80798>

27. Flores-Garza PL, López-García KS, Jiménez-Padilla BI, Alonso Castillo MM, Guzmán Facundo FR. Adaptación y modificación del programa preventivo del consumo de drogas “Tú Decides”. *Rev. RIIAD* 2021;7(1):33-42. <https://riiad.org/index.php/riiad/article/view/riiad.2021.1.05/332>

28. Galindo-Huertas MS, Galvis-López MA, Algarra-López LS, Sandoval-Puentes NA, Rodríguez-Ramírez KS. Intervenciones y estrategias para prevenir y reducir el consumo de alcohol en los jóvenes universitarios. *Index Enferm*, 2022;31(2):96-99. <https://scielo.isciii.es/pdf/index/v31n2/1132-1296-index-31-02-96.pdf>

29. Salgado G, Gaete J, Gana S, Valenzuela D, Araya R. Acceptability, feasibility and fidelity of the culturally adapted version of Unplugged (“Yo Se Lo Que Quiero”), a substance use preventive program among adolescents in Chile: a pilot randomized controlled study. *BMC Public Health*. 2024;24(2026):1-14. <https://doi.org/10.1186/s12889-024-19499-2>

30. Sanday J, Scappatura ML, Banasco Falivelli MB, Rutsztein G. Factibilidad y aceptabilidad de un programa virtual de prevención integrada de problemas relacionados con la alimentación, el peso y la imagen corporal (programa PIA- 2 virtual). *Experiencia del usuario. Rev. Puertorriq. Psicol.* 2023;34(2):248-260. <https://doi.org/10.55611/revps.3402.09>

31. Zamorano-Espero JA, Herrera-Paredes JM. Life Skills in Adolescent Alcohol Use: A Literature Review. *Salud Cienc. Tecnol.* 2023; 3:600. <https://doi.org/10.56294/saludcyt2023600>

32. Ho, FK, Tung K, Wong RS, Chan KL, Wong W, Ho SY, Lam TH, Mirpuri S, Van Voorhees B, Wa Fu K, Bong Chow C, Chua G, Tso W, Jiang F, Rich M, Ip P. An Internet Quiz Game Intervention for Adolescent Alcohol Drinking: A Clustered RCT. *Pediatrics*. 2021;148(6):e2021051005. <https://doi.org/10.1542/peds.2021-051005>

33. Noh-Moo PM, Castillo-Arcos LC, Telumbre-Terrero JY, Maas-Góngora L, Ramírez-Sánchez SC, Tirado-Reyes RJ. Alcohol use as a predictor of child-to-parent violence in adolescents from southern México. *Rev Esc Enferm USP*. 2024;58:e20240016. <https://doi.org/10.1590/1980-220X-REEUSP-2024-0016en>

FINANCING

The authors did not receive funding for the development of this research.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Jesús Antonio Zamorano Espero, José Manuel Herrera Paredes.

Data curation: Jesús Antonio Zamorano Espero, José Manuel Herrera Paredes, Enrique Blancarte Fuentes.

Formal analysis: Jesús Antonio Zamorano Espero, José Manuel Herrera Paredes, Luz Angela Reyes Ríos.

Research: Jesús Antonio Zamorano Espero, José Manuel Herrera Paredes, Enrique Blancarte Fuentes, Dorian Esperanza Camacho Rodríguez.

Methodology: Jesús Antonio Zamorano Espero, José Manuel Herrera Paredes, Luz Angela Reyes Ríos, Yadira Mateo Crisóstomo.

Project management: Jesús Antonio Zamorano Espero, José Manuel Herrera Paredes, Luz Angela Reyes Ríos.

Supervision: José Manuel Herrera Paredes, Enrique Blancarte Fuentes, Luz Angela Reyes Ríos.

Validation: José Manuel Herrera Paredes, Luz Angela Reyes Ríos, Dorian Esperanza Camacho Rodríguez.

Writing - original draft: José Manuel Herrera Paredes, Yadira Mateo.

Writing - review and editing: Jesús Antonio Zamorano Espero, José Manuel Herrera Paredes, Luz Angela Reyes Ríos, Enrique Blancarte Fuentes, Dorian Esperanza Camacho Rodríguez, Yadira Mateo Crisóstomo.