

Educational intervention to increase risk perception of alcohol and tobacco use among adolescents in Zaruma

Intervención educativa para incrementar la percepción de riesgo sobre el consumo de alcohol y tabaco en adolescentes de Zaruma

Intervenção educacional para aumentar a percepção de risco em relação ao uso de álcool e tabaco entre adolescentes em Zaruma

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Abstract

Introduction: Inhabitants of the canton of Zaruma, Ecuador, report excessive psychoactive substance use among adolescents, which is also reflected in local health statistics. **Objective:** To implement an educational intervention to increase the adolescents' risk perception of alcohol and tobacco use in a school in the canton of Zaruma. **Methodology:** The present research is an explanatory quasi-experimental pretest-post-test study conducted between October 2023 and March 2024 in Villa Real de San Antonio del Cerro de Oro de Zaruma, Ecuador. The intervention was implemented in two subgroups (40 and 50 students), respectively. **Results:** Sixty percent of adolescents reported consuming alcoholic beverages, and 57.8% reported having smoked. Before the intervention, the risk perception was 61.09%. After the implementation of the educational strategy, it was 70.47%. **Conclusions:** Adolescents were predominantly male, with a mean age of 15.7 years and living with both parents; more than half reported alcohol and tobacco use. The educational strategy was effective as it significantly increased risk perception, especially in recognizing the negative consequences of alcohol and in the critical attitudes toward legal substance use, supporting its use as a viable preventive tool in the school setting.

Keywords: Educational Intervention; Adolescents; Alcohol; Tobacco

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Resumen

Introducción: Los habitantes del cantón de Zaruma, Ecuador, reportan un consumo excesivo de sustancias psicoactivas en los adolescentes que además se refleja en las estadísticas de salud territorial. **Objetivo:** Implementar una intervención educativa para incrementar la percepción de riesgo del consumo de alcohol y tabaco en los adolescentes de un colegio del cantón de Zaruma. **Metodología:** La presente investigación corresponde a un estudio explicativo cuasiexperimental, con pre y post prueba, desarrollado entre los meses de octubre de 2023 y marzo de 2024, en la Villa Real de San Antonio del Cerro de Oro de Zaruma, Ecuador. La intervención se implementó en dos subgrupos (40 y 50 estudiantes) respectivamente. **Resultados:** El 60 % de adolescentes reportó haber consumido bebidas alcohólicas y el 57,8% haber fumado. Antes de la intervención, la percepción de riesgo era de 61,09%. Después de la intervención, la percepción de riesgo fue del 70,47%. **Conclusiones:** Los adolescentes eran mayoritariamente varones, con una edad promedio de 15,7 años y convivencia con ambos padres. Más de la mitad refirió haber consumido alcohol y tabaco. La estrategia educativa implementada demostró efectividad al incrementar de manera significativa la percepción de riesgo, especialmente en el reconocimiento de las consecuencias negativas del alcohol y en la actitud crítica hacia el consumo de sustancias lícitas, y se consolida como una herramienta preventiva viable en el ámbito escolar.

Palabras claves: Intervención Educativa; Adolescentes; Alcohol; Tabaco

Resumo

Introdução: Os habitantes do cantão de Zaruma, Equador, relatam consumo excessivo de substâncias psicoativas entre adolescentes, o que também se reflete nas estatísticas territoriais de saúde. **Objetivo:** Implementar uma intervenção educativa para aumentar a percepção de risco do consumo de álcool e tabaco entre adolescentes de uma escola do cantão de Zaruma. **Metodologia:** A presente investigação responde a um tipo de estudo explicativo e quase experimental com pré e pós-teste, desenvolvido entre os meses de outubro de 2023 e março de 2024. O contexto do estudo foi a Villa Real de San Antonio del Cerro de Oro de Zaruma, Equador. Foram trabalhados dois subgrupos (40 e 50 alunos), respectivamente. **Resultados:** 60% dos adolescentes admitiram ter consumido bebidas alcoólicas e 57,8% responderam ter fumado; antes da intervenção, a percepção de risco era de 61,09%. Após a implementação da estratégia educativa, o percentual de percepção de risco foi de 70,47%. **Conclusões:** Os adolescentes eram predominantemente do sexo masculino, com média de idade de 15,7 anos e residiam com ambos os pais. Mais da metade relatou ter consumido álcool e tabaco. A estratégia educativa implementada mostrou-se eficaz em aumentar significativamente a percepção de risco, especialmente no reconhecimento das consequências negativas do álcool e na atitude crítica em relação ao uso de drogas lícitas, consolidando-se como uma ferramenta preventiva viável no ambiente escolar.

Palavras-chaves: Intervenção Educativa; Adolescentes; Álcool; Tabaco

Introduction

Adolescence is characterized by anatomical, physiological, and psychological changes that affect the adolescent's health, as well as by the adoption of risky behaviors that may persist into adulthood¹. Psychoactive substance use during adolescence is a global public health concern due to its negative physical, psychological, and social consequences. For example, tobacco and alcohol use has been associated with a higher risk of behavioral problems and social maladjustment. Furthermore, alcohol consumption may impair neurocognitive functioning².

The World Health Organization³ provides a comprehensive overview of alcohol consumption and the burden of disease attributable to this substance worldwide. It reports that more than one quarter (27%) of adolescents aged 15-19 are current drinkers. The Pan American Health Organization⁴ reported that 2.6 million deaths each year are attributable to alcohol use (representing 4.7% of all deaths).

Among university students in Quito, the most commonly consumed substances are alcohol, cigarettes, marijuana, and cocaine. This predominates among males⁵. In recent years, alcohol and other psychoactive substance use in the Ecuadorian population has increased. Prevention and treatment of psychoactive substance use in Ecuador have not demonstrated effectiveness⁶.

Cigarette and alcohol use among adolescents is a major health risk factor and remains highly prevalent during this stage of life. Identifying how these health-related behaviors change throughout adolescence, as well as the factors associated with such changes, is important for the development of psychosocial interventions.

Alcohol, tobacco, and other substance use constitutes a social, family, and public health concern in Ecuador. These substances are consumed in educational institutions, making it crucial to find a solution. To this end, clear, up-to-date, systematically collected, and reliable information is required to serve as a tool for making preventative decisions.

In the canton of Zaruma, residents consider this situation a worrying problem in the community, and it is reflected in local health statistics. Therefore, this study aimed to implement an educational intervention to increase adolescents' perception of alcohol and tobacco use in a school in the canton of Zaruma.

Methodology

This study employed an explanatory, quasi-experimental, pretest-post-test design and was conducted between October 2023 and March 2024. The study took place in Villa Real de San Antonio del Cerro de Oro, Zaruma, Ecuador. Specifically, the research was conducted in a school with 64 teachers, 9 administrative staff, and 1103 students, of whom 763 are in high school.

Universe and sample

The universe consisted of the 763 students enrolled in the high school level in the aforementioned school. A non-probability purposive sample was selected based on the inclusion criteria, forming two subgroups of 40 and 50 students, respectively. The final sample comprised 90 students aged 15-18 years.

Inclusion Criteria

- Students with reported psychoactive substance use.
- Students aged 15 to 18 years.
- Adolescents residing in the health service catchment area during the study period.
- Students who agreed to participate in the educational intervention.
- Written authorization from parents or a legal guardian.

Instrument

The Risk Perception Questionnaire for Legal Substance Use⁷ was administered. The instrument consists of 38 items organized into five subscales:

- 1) Negative consequences of alcohol use (items 8, 10, 11, 12, 13, 14, 19, 20, and 34)
- 2) Negative attitudes toward legal substance use (items 27, 28, 29, 30, 35, 36, 37, and 38)
- 3) Legal substance use to make friends and experience new sensations (items 22, 23, 24, 25, 26, 31, and 32)
- 4) Legal substance use for coping and belonging (items 1, 2, 3, 4, 5, 6, 7, 15, 16, 17, and 18)
- 5) Negative consequences of tobacco use (items 9, 21, and 33)

The intervention strategy was developed based on the educational needs identified through group activities and key informant interviews.

The educational process was conducted through group discussions. The content was simple and delivered using appropriate educational training techniques. Educational work was conducted with the adolescents to promote health self-care. Follow-up of adolescents participating in the intervention through in-person, motivational meetings to complement the training, provide follow-up, and share experiences among participants.

The educational intervention included the following sessions and topics, as shown in **Table 1**.

Table 1. Summary of the educational intervention strategy on adolescents' risk perception of alcohol and tobacco use.

Session	Topic	Objective
1	Self-knowledge and psychosocial characteristics of adolescence	Provide adolescents with the opportunity for self-knowledge.
2	Vulnerability and causes of alcohol and tobacco use	Share knowledge about the main causes leading adolescents to consume legal substances such as alcohol and tobacco.
3	Risk factors for tobacco and alcohol use.	Explain risk factors and their relevance in preventing substance use.
4	Analysis of risk behaviors	Identify risky behaviors, their possible consequences in different situations, and reflect on the negative consequences of use.
5	Normative beliefs about alcohol and tobacco	Raise awareness of how beliefs directly influence decision-making.
6	Legal substance use as coping and belonging.	Explain the mechanism of action of alcohol on mood and the perception of "functioning well."
7	Legal substance use to make friends and have new experiences	Understand social pressure where "friends" are key in the initiation and maintenance of use.
8	Assertiveness and communication skills	Learn when to say NO effectively, politely, and assertively.
9	Decision-making	Learn to define personal goals as guidance for problem-solving.
10	Physical activity (dance therapy and/or walking)	Avoid negative thoughts through recreational activities.

Ethical Aspects of the Research

This study was conducted in strict compliance with the principles of beneficence, non-maleficence, autonomy, and respect for participants' dignity. To safeguard confidentiality, the actual name of the educational institution is not disclosed in order to protect adolescents' privacy. All participants, along with their parents or legal guardians, received clear information about the study objectives and procedures and provided written informed consent. The educational institution formally authorized the research. Additionally, the data collected were used exclusively for academic and scientific purposes, ensuring confidential and anonymous handling throughout all stages of the research process.

Results

Table 2 shows that 60% of adolescents reported consuming alcoholic beverages and 57.8% reported having smoked; thus, more than half of the studied population had contact with harmful substances.

Table 2. Adolescents reporting substance use

Substance use	% (n) (n=90)
Alcohol	
Yes	60.00 (54)
No	40.00 (36)
Tobacco	
Yes	57.77 (52)
No	42.02 (38)

As shown in **Table 3**, there was a slight predominance of males (52.2%). Regarding occupation, 91.1% of adolescents were students. In terms of living arrangements, the largest proportion of adolescents (58.9%) reported living with both parents. The mean age of the study participants was 15.7 years (ranging from 14 to 18 years). The most frequent age was 15 years, representing 38.9% of the population.

Table 3. Sociodemographic description of adolescents

Sociodemographic variable	%(n)
Sex	
Male	52.02 (47)
Female	47.08 (43)
Occupation	
Student	91.01 (82)
Student and working	8.09 (8)
Living arrangement	
Both parents	58.09 (53)
Mother and her partner	14.04 (13)
Mother only	17.08 (16)
Father and his partner	2.02 (2)
Grandparents or uncles	6.07 (6)
Age ($\bar{X}$ =15.73)	
14 years	11.01 (10)
15 years	38.09 (35)
16 years	23.03 (21)
17 years	18.09 (17)
18 years	7.08 (7)

Table 4 shows that risk perception was 61.09% before the intervention and 70.47% after the implementation of the educational strategy, representing an increase of 9.65 percentage points. This increase was statistically significant ($p=0.000$). The change was positive across all instrument subscales.

Table 4. Percentage of adolescents showing risk perception of legal substance use by subscale and overall.

Subscale	Before (%)	After (%)	Difference	p value
1. Negative consequences of alcohol use	70.79	84.30	13.28	<0.001
2. Negative attitudes toward legal substance use	69.19	80.11	10.92	<0.001
3. Legal substance use to make friends and experience new sensations	53.59	59.78	6.19	<0.001
4. Legal substance use for coping and belonging	48.99	56.28	7.29	0.001
5. Negative consequences of tobacco use	72.22	80.30	8.07	<0.001
Overall	61.09	70.47	9.65	<0.001

P value: paired t-test

Discussion

The percentage of alcohol consumption found in this study is similar to that reported worldwide, as approximately 40% of adolescents in Europe consume alcohol, consistent with the findings of Macías et al.⁸. In contrast, the percentage of adolescents who reported having smoked at some point in their lives was higher than that reported

by Galbe Sánchez-Ventura et al.⁹, where 41.3% of young people reported smoking, whereas Correa-López et al.¹⁰ reported a prevalence of only 30%. These differences may be explained by sociocultural factors, the school environment, and substance availability; however, the sample size and participants' age should be considered. It is clear that both alcohol and tobacco use are current problems with a global impact and should be addressed.

Regarding the sociodemographic profile, a predominance of males was observed, consistent with the findings of Pérez-Milena et al.¹¹, but in contrast to Rodríguez de la Cruz et al.¹², where participants were predominantly female. In terms of occupation, most adolescents were exclusively students, consistent with the findings of Angulo et al.¹³. Regarding family living arrangements, the fact that most adolescents live with both parents indicates a family configuration that remains common in Ecuador. This finding provides a local perspective on the structure of the family unit; that is, the predominance of two-parent nuclear families among adolescents. Although the sociodemographic context has changed, two-parent nuclear families continue to be the most common, according to Barzallo¹⁴. For example, in Quito, 28.04% of households with children and adolescents have this structure, according to the Local Governments for Children¹⁵. However, ongoing social transformations may modify these dynamics in the future.

Finally, the mean age of the study participants was 15.73 years, which differs slightly from the mean age of 16.19 years reported by Delgadillo et al.¹⁶. Similarly, several studies on risk perception related to alcohol and tobacco use have been conducted among university students, in contrast to the studies by Rodríguez de la Cruz et al.¹² and Angulo et al.¹³, in which the mean age of participants was 19 years. This difference is relevant because the earlier the substance exposure, the greater the risk of dependence and long-term neurocognitive damage.

One of the most important findings was the increase in risk perception after the educational intervention, which rose from 61.09% to 70.47%. This change was statistically significant ($p < 0.001$) and is consistent with the findings of Rodríguez de la Cruz et al.¹², Angulo et al.¹³, Delgadillo et al.¹⁶, and González-Roz et al.¹⁷. Higher risk perception was associated with a lower incidence of psychoactive substance use. These results support the idea that educational strategies based on dialogue, reflection, and active learning are effective in preventing risky behaviors.

Evidence also indicates that educational interventions, both face-to-face and digital, have a positive impact on preventing substance use^{18,19}. However, access to information alone does not guarantee behavioral change. Therefore, these programs should be accompanied by follow-up and reinforcement strategies, with the active participation of families, teachers, and the community.

Conclusions

The results allow several improvement actions to be proposed to strengthen the impact of these types of interventions. These include expanding educational strategies to other institutions in the province using an intersectoral approach; actively including parents and caregivers in training processes that reinforce preventive messages at home; implementing ongoing recreational and sports activities as healthy alternatives; strengthening the teaching role through specific training in prevention; and designing longitudinal monitoring mechanisms to evaluate sustained effects over time.

In summary, the strategy implemented in Villa Real de San Antonio del Cerro de Oro in Zaruma was effective in increasing adolescents' risk perception of alcohol and tobacco use. Furthermore, it provides a replicable model at the community and regional levels, with the potential to contribute significantly to the reduction of these risky behaviors during adolescence.

Authors' contributions

LKTC: conception. SIM: manuscript writing. TRQ: data analysis. JRFR: critical review. YAB: final approval of the version to be published.

Conflict of interest

The authors of this study declare no conflicts of interest.

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