

## A quasi experimental community intervention in primary school by Pharmacy students of the University of Costa Rica

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### Abstract

**Background:** Children are a vulnerable group of the social phenomenon of drugs. Hence, community interventions are needed to strengthen protective factors and help children to stay out of the world of drugs.

**The objective** of this work is to describe a quasi-experimental community intervention that tried to reinforce in the students of the visited schools the role they have to decide on the actions that are beneficial to their well-being and to distance themselves from the consumption of drugs, this was through an artistic work developed by the students of Pharmacy.

**Methodology:** In the first academic year 2017, a group of twenty-three students with teaching support from the Healthy Styles of Pharmacy course at the University of Costa Rica, developed a quasi-experimental community intervention through an artistic work (theater play) of the staging of a play entitled "I am who decide", which describes situations that exemplify some abilities for the life. The schools were not selected at random because their choice was facilitated by pharmacists working in the Social Security of Costa Rica, in both schools the intervention was executed and only a questionnaire was applied to know if the children had captured the messages implicit in the artistic work.

**Results:** A total of 167 children (42% male, 58% female) between 11 and 15 years old (only two adolescents older than 12 years old) from the sixth year of primary education, 128 children at the Finca Guarari school and 39 children at the Barreal school; Both located in the province of Heredia, Costa Rica. The script of the work and an instrument with eight key questions were elaborated by students with teaching support from the Faculty of Pharmacy. The work is developed in an interactive way and describes the experiences of school children who must make decisions; it is composed of six scenes and in them are evidenced the abilities for life. The response rates before and after the staging of the play were improved for all the questions, which shows that the all messages of the protective factors that prevent drug addiction through the theater play were clear.

**Conclusion:** This quasi experimental community intervention as educational project is useful as a complement to a playful way of working in schools for drug prevention.

**Keywords:** drug, prevention, students, pharmacy, school, education

### Introduction

Drugs represent a public health problem at all social levels and in all places around the world, and children are very vulnerable to initiate uncontrolled use of drugs; especially those that are legal and are more commercially available such as alcoholic beverages and nicotine cigarettes or illegal as the marijuana and cocaine <sup>[1, 21]</sup>.

The children are in the development of all their capacities and they have a cerebral immaturity that predisposes them to the harmful effects of the use of the drugs. Likewise, social environments in the home, community or through the media, encourage the consumption of alcoholic beverages or nicotine cigarettes <sup>[22, 23]</sup>. Children can access these spaces either face-to-face or with the use of technologies and because of their desire to experiment, by group pressure or by the example of people close to them, initiate drug use without knowing for sure, the results that this entails in short or long term; including biopsychosocial problems, accidents, homicide, suicide, school dropout, legal problems, violence, addiction and death <sup>[24, 33]</sup>.

The consumption of these drugs begins at an earlier age and it is for this reason that preventive programs, which are taking action at the present time to in order to reduce likelihood that

a problematic, future outcome will come to pass. Those programs are of different nature, such as education and awareness raising campaigns or skills building-psychosocial and computers based programmes; which are developed to strengthen the children's life skills and their knowledge and prepare them to decide on the actions that favor their well-being and away from problematic situations that are related to drugs <sup>[7, 20, 28, 34, 39]</sup>. In this regard, the World Health Organization has defined life skills as adaptive and positive behavioral skills that enable people to cope effectively with the demands and challenges of everyday life <sup>[40]</sup> and this can be addressed through different mechanisms in projects or programs.

Among these programs are a) the universal programs that are directed to the general population through the promotion of health, b) there are also the selective programs that are for specific risk groups because people are in harmful environments due to intrafamily violence, alcoholism parents, poverty or are children with behavioral or learning problems and c) those who are indicated, which are those programs for people who are suspected or already have drug use <sup>[6, 12, 15, 17, 38, 39, 41, 44]</sup>.

Different methodologies are used in the programs and

appropriate techniques are implemented according to the characteristics of each population group<sup>[28]</sup>. In the Faculty of Pharmacy of the University of Costa Rica, a group of students of the Healthy Lifestyles course, who were aware of this reality, decided to carry out a community intervention in children from vulnerable schools in the greater metropolitan area through the staging of theater (artistic work), which is framed in the skills for life and conveys a message to prevent the consumption of drugs<sup>[43]</sup>.

This project complements those actions carried out in various programs in primary school in Costa Rica, such as: a) "DARE" program that began in 1991 until today to prevent drug use and violence in childhood, b) "I learn to value myself", which is a state program by Alcohol and Drug Addiction Institute of Costa Rica that promotes the teaching and practice of living skills in the school population as a strategy to prevent drug use<sup>[45, 48]</sup>.

This is why it is important, as the different educational interventions carried out at the community level, tend to reinforce protective factors in children, so as to reduce the risk factors that lead them to enter the world of the drugs. These interventions must be continued over time and must include the largest number of social actors in the communities<sup>[41, 49, 50]</sup>.

The objective of this work is to describe a quasi-experimental community intervention that tried to reinforce in the students of the visited schools the role they have to decide on the actions that are beneficial to their well-being and to distance themselves from the consumption of drugs, this was through an artistic work developed by the students of Pharmacy.

## Methodology

### a) General aspects

This educational project was developed during the first university academic cycle in 2017, within the framework of the Healthy Lifestyles course, where students must undertake community interventions in which they apply the knowledge and skills learned in the Pharmacy's Faculty at the University of Costa Rica.

### b) Bioethical aspects

All academic activities carried out within the framework of a teaching course must consider the different bioethical aspects for each particular situation but do not have to be approved by the Scientific Bioethical Committee of the University of Costa Rica for its execution.

### Population and site where community intervention was developed

The intervention was directed at 167 sixth grade children (42% male, 58% female), aged 11-15 (only two adolescents over 12 years old) from two marginal urban areas in Primary schools in the metropolitan area are intrafamily violence, drug use and lack of social opportunities<sup>[3]</sup>; Guarari Villa School and Barreal, both in Heredia, Costa Rica.

The logistical aspects in the two schools were made possible thanks to the collaboration of two pharmacists working in the Heredia Virilla Health Area and part of Costa Rica's Social Security, who obtained all the administrative permits established by the Ministry of Public Education of Costa Rica for this type of intervention (permissions of the addresses of each school, presentation of the written intervention and

permission of the parents so that their children were present in the intervention)

### Developers of the educacional intervention

A total of twenty-three Pharmacy students performed a team work to stage a theater entitled "I am who decide", this with the support and guidance of a teacher.

The group of students rehearsed the artistic work and prepared the costumes and a mobile stage. One student was a host and was asked to make a small preamble before each scene and at the end of each one made a recount of the facts and achieved that the children had an active role answering and commenting on each scene. The teacher facilitates and supervises the whole process, also takes care of the student transport and coordinates with the pharmacists of the Heredia Virilla Health Area all the logistical aspects of each school.

### Design of the community intervention

This quasi-experimental community intervention sought to strengthen the protective factors in drug prevention through an artistic work (theater play) in school children in two marginal urban areas. The selection of the schools was not controlled but in both the same intervention was performed so that the allocation was not random, for ethical reasons there was no control group without intervention.

The most common design of this type of intervention is the before-after study of a single group. Given that the data collection instrument sought only to verify the comprehension of the messages addressed in the artistic work, it is not possible to compare knowledge before and after the child's exposure to the only experimental intervention in which each child is controlled.

### The theater play (community intervention)

The artistic work (theater play) is divided into six scenes and in each of them is highlighted in the script that interpret the characters, at least two skills for life. In total, the theatre play has a duration ranging from thirty to forty-five minutes. The artistic work tells the story of two young people who are involved in the drug phenomenon by the consumption of alcohol and tobacco, where they must test their abilities to live, make decisions and take actions. There is a very significant contrast between the families of both main characters and this is a way of highlighting the importance of communication among family members. During the first scene the main characters are presented and the skills of handling of feelings and self-control are evidenced. In the second scene two contrasting scenarios are presented, the first family where there is empathy and effective communication, in the other family that is dysfunctional there are risk factors that predispose a child to drug use since parents are consumers of drugs and they also have partner problems. During the third scene appears a group of children arguing because they want to make the decision to escape from school to go to use drugs, here one of the main character gives in to the pressure of the group and the other uses critical thinking to assess the consequences of this act. At that moment, the teacher of the school intervenes and discover the plans of the group of children and decides to act to avoid possible problems. In the fourth scene, the teacher talks to the parents of the children who wanted to escape to use drugs, the teacher informs them that the school has taken action in the

matter but needs their support. Here it shows the important role of the support network in the family and in the educational center. In the fifth scene, the two main characters are found in the house of the dysfunctional family and discuss the differences in the customs of both families, this shows that family values and examples are relevant for children. During this scene appear two other fictional characters that are the cigar and the beer, who show the consequences that they cause in the people who use them and explain how the addiction process happens. In the last scene, the two main characters recognize the mistakes they made and project their new future without the use of drugs because the cigar and the beer is gradually diminished in the scene. The script of the play and the questionnaire of key questions was elaborated by students with professor support of the Faculty of Pharmacy of the University of Costa Rica.

**Opinions of school students**

The scenes of the artistic work were presented in each school, before and after that, a questionnaire was applied to know the opinion of the students regarding the main subjects. In this sense, this questionnaire only captures the opinions of the school students of each school, before and after the performance of the theater play.

**Instrument for collecting school opinions**

The key questions of the questionnaire were:

1. Do you think that boys can in the same way as girls, express their emotions (laughing, crying, shouting) in any situation.
2. Do you think girls and boys should help with chores at home (washing plaster, bedding, sweeping, cleaning, picking).
3. Do you think it is important to tell parents what you do with your friends.
4. Do you think beer and cigarette help you to get friends.
5. Are you agree to stop going to class for other activities (play, talk, eat ice cream, go to the movies, be with your friends).
6. When you do something wrong, you expect a call for attention (verbal) or punishment (not play, blows, shouts, others) from your parents.
7. Do you know that cigarette and beer cause damages in people who consume them or those who are close to them.
8. Do you know that all decisions you can make have positive or negative effects on your life.

For each question the child answers yes or no and had a space to make voluntarily comments to each question.

**Results presentation**

The results of student opinions are presented in percentages for each key question and the most relevant textual comments given by some students are presented for each key question.

**Statistical Analysis**

Given the nature of the educational intervention of the community, only a specific and comparative descriptive analysis of the percentages of answers obtained was carried out. The main results of this intervention are described below.

**Results**

Tables 1 and 2 show the percentages of students' responses to

each of the key questions on aspects of drug prevention before and after artistic work.

**Table 1:** Percentage answers for each question before and after the artistic work at Guarari Villa School

Question number	N=128		After	
	Before	yes	no	yes
1	72	28	97	03
2	80	20	90	10
3	79	21	93	07
4	16	86	07	93
5	8	92	02	98
6	65	35	90	10
7	84	16	98	02
8	88	12	97	03

**Table 2:** Percentage answers for each question before and after the artistic work at Barreal Elementary School

Question number	N=39		After	
	Before	yes	no	yes
1	95	5	98	02
2	100	0	100	0
3	97	3	100	0
4	3	97	0	100
5	3	97	0	100
6	69	31	90	10
7	84	16	96	04
8	97	9	100	0

**Descriptive analysis of the data**

**a) Guarari Villa School**

72% of the students of the Guarari Villa School before the play, considered that children as well as girls can express their emotions; that percentage increased to 97% after the artistic work, where it was mentioned that children can cry when they suffer a loss of a loved one.

80% of the students of the Guarari Villa School before the play said that the children should help with the chores of the home, this after observing the characters perform sexually those tasks; the percentage increase to 90% after the artwork.

79% of the students of the Guarari Villa School before the play, considered it necessary to communicate to their parents about their friends; this percentage then increased to 93%.

14% of the students at the Guarari Villa School before the theater thought that beer and cigarettes help them to have friends, the percentage dropped to 7% after observing the interpretation of these characters in the artistic work.

8% of the students of the Guarari Villa School before the play think that they can leave school for other activities, the percentage decreased to 2% after the situations presented in the artistic work.

65% of the students at the Guarari Villa School prior to the theater play considered that parents should use corrective measures when they do something wrong, the percentage increase to 90% when observing the contrasts of the parents who act in the artistic work.

84% of the students of the Guarari Villa School before the play expressed the damages that cigarette and beer can cause, after the artistic work the percentage increased to 98% due to the explanations given during the staging of the actors.

88% of the students of the Guarari Villa School before the theater play know that the acts have consequences, that percentage increased to 97% with the situations that the

characters live in the artistic work.

#### b) Barreal Elementary School

95% of the students at Barreal Elementary School prior to the theater play, considered that children as well as girls can express their emotions; that percentage increased to 97% after the artistic work where it was mentioned that children can cry when they suffer a loss of a loved one.

100% of the students at the Barreal Elementary School prior to the theater play said that children should help with household chores, so the artistic work did not influence this aspect.

97% of the students of the Barreal Elementary School before the theater play, considered it necessary to communicate to their parents about their friends; this percentage then increased to 93%.

3% of the students at the Barreal Elementary School prior to the theater play thought that beer and cigarettes help them to have friends, the percentage decreased to 7% after observing the interpretation of these characters in the artistic work.

3% of the students of the Barreal Elementary School before the theater play think that they can leave school for other activities, the percentage decreased to 2% after the situations that appear in the artistic work.

69% of the students at Barreal Elementary School prior to the play considered that parents should use corrective measures when they do something wrong, the percentage increase to 90% by observing the contrasts of the parents who act in the artistic work.

84% of the students of the Barreal Primary School before the play expressed the damages that cigarette and beer can cause, after the artistic work the percentage increased to 98% due to explanations given during the staging of the actors.

97% of the students of the Barreal Primary School before the theater play know that the acts have consequences, that percentage increased to 97% with the situations that the characters live in the artistic work.

The children of both schools have previous knowledge regarding the topics covered in the artistic work, this is deduced when observing that the percentages of answers are superior, in all cases, to fifty percent. This is probably due to the fact that these issues addressed in the artistic work are considered as a preliminary during the permanent program developed by the Costa Rican Institute for Drug Dependence and Alcoholism in the children of these schools.

The response rates of Barreal elementary school children are, in almost all cases, better than the children's response rates Guarari Villa School; this is possibly because they are developed in a social environment that has fewer risk factors or that have more strengthened the protective factors and that contributes to the children's learning in school is complemented with the external environment where they develop. Only with respect to the consequences of cigarette and beer, in both schools the percentages were the same; while the percentages are similar in the role of parents when children do something wrong.

The following are the most representative general comments to the life skills or values that the children made to each key question in every school, including comments before and after the artistic work, it is presents in this way because there was no differences between those moments.

#### a) Villa Guarari School

- The following comments show the rights, equality, autonomy, self-knowledge and empathy.  
"It is right", "We are the same", "We have different thoughts", "The boy or girl can do what he/she wants", "Boys believe stronger than girls", "We have the same feelings", "We have the same emotions"
- The following comments show the duties to be fulfilled, solidarity, order and cleanliness.  
"It is important to help", "It is a job for all", "It is a duty", "It is an obligation", "It is important to have health"
- The following comments refer to reporting, trust, counseling, experience and communication.  
"If they have friends who use drugs", "If they miss classes or use drugs", "We have to prevent something from happening to us", "Choose friends", "Who can help us", "Do not stay silent if they make me bullying"
- The following comments show self-knowledge, decision-making and self-criticism analysis.  
"They accept me as I am" "Friends advise us badly" "They are addictive" "They are bad" "We do not need them"
- The following comments show self-knowledge, critical analysis and decision-making.  
"Study is important" "Avoid losing subjects" "To be someone in life" "To have a better future"
- In the following comments notice decision-making, self-criticism, interpersonal relationships, rights, communication.  
"Not to receive aggression", "To receive correction", "To talk", "Converse is better", "To have confidence"
- In the following comments critical and cause-effect reasoning is observed.  
"Physical and mental" "Violence"
- In the following comments is considered cause-effect reasoning and decision making.  
"By experience lived", "Everything that is done is received something", "According to what is done" "You have to know what is done"

#### b) Barreal Elementary School

- The following comments show the right, self-knowledge and empathy.  
"It's our right", "it's important", "we're the same", "We are equal", "We need to express emotions"
- The following comments show solidarity, awareness and responsibility.  
"It is a duty", "To be responsible", "You have to help", "To help", "clean up what we dirty"
- The importance of trust, counseling, interpersonal relationships and safety are indicated.  
"To have confidence", "To know everything", "Advise us", "For our safety", "Help us"
- The following comments show self-knowledge, self-criticism, cause-effect and decision-making.  
"Do not benefit", "They hurts us", "It is bad", "they do not benefit at all"
- The following comments show responsibility, decision making and self-criticism.  
"To be learned", "To have a better future", "To be responsible"



6. In the following comments notice decision-making, self-criticism.  
"Non-violence" "Not child abuse"
7. In the following comments critical and cause-effect reasoning is observed.  
"Cause illness", "Those are harmful"
8. In the following comments is considered cause-effect reasoning and decision-making.  
"Decisions have consequences", "Everything influences",  
"Every effect corresponds to an action"

### Discussion

The problematic situation of drugs is a complex social phenomenon that "is the result of a combination of cognitive, social, biological, personality, pharmacological and development factors" [38]. Therefore, the results of this educational experience reveal that it is important to promote in children in different domains the protective factors that help prevent drug-related risk behaviors [4, 13, 27, 38]. Because the intervention becomes a contribution in building experimental experiences that help children visualize the need to develop life skills [40].

The students of the primary schools visited show that they know important aspects related to the subject of drug prevention, so that with the artistic work developed by the students of Pharmacy, only the percentages of answers of the students of both schools were improved, observing the answers given before and after the artistic work "I am who decides". In addition, these findings agree with some results reported in other studies conducted in elementary school students in Costa Rica [19, 45, 48].

Children are a really vulnerable group to the social phenomenon of drugs [33] and some are more likely to use substances (cigarettes, alcohol, marijuana) when they engage in risky behaviors. Hence, any intervention should be embedded in an early prevention program aimed at such risk behaviors [5]. Although primary school pupils from the visited schools have knowledge about drugs, they have a greater number of individual, familial and social risk factors due to the socialization environment in which they live [51] and where economic limitations and job opportunities in the community [19]; which contrasts with the theoretical learning that children receive within the school. Therefore, it is very important to increase the ability of these children to withstand social pressure to use drugs out of school in many places, such as face-to-face on their neighbor or on social networks [22, 25]. In this way, life skills training is a very useful tool that helps people at other ages [18, 24, 40] on skills such as self-control, self-awareness, interpersonal relationships, empathy, emotional and stress management, conflict resolution and others; in the same that they are necessary to make better decisions in life [20, 25, 38, 43].

In this sense, it is said that in those highly vulnerable to the drug phenomenon, preventive educational programs [7-10, 12, 15, 17, 19, 21, 26, 31, 32] play a predominant role in the struggle to mitigate children's contact or drug damage at an early age [6, 42], hence attempting to delay such contact [4, 20, 28] even though they may be in hostile environments or adverse events where risk factors predominate. Spaces of socialization, where children can easily access various drugs, including alcohol and cigarettes that are legal in Costa Rica. It has been seen that the legality of these products can have a very subtle

influence on the consumption of some drugs [8], especially when in their families, neighborhoods and communities or through technology, they promote images and commercials that sell ideal illusions about the use of drugs and that these provide easier ways to solve problems in life [52] or what to expect, when they are given direct access to drugs [3, 20, 25, 44].

Students may be exposed to advertisements in malls, online, cable television, movies, newspapers and magazines; although it seeks to limit children's access to these environments [53, 54]. However, the main challenges facing children are very close to their living environment, this implies patterns of drug use habits that go unnoticed as socialization events, such as family celebrations or friends' products of various celebrations (birthdays, anniversaries, deaths, among others) and although social pressure can have a positive or negative effect on children, this phenomenon of socialization allows children to learn what other people do [7, 13, 17, 29]. That is why children need protective factors to help in this struggle and this includes the role of schools, support, communication and trust with parents, spaces where physical and social skills must be developed through sport, art and culture.

Children are placed in a dilemma, since in the educational field they learn values, rights, various forms of expression of emotions, knowledge, abilities, skills and that drugs can cause harm to some people [19]; but children observe that in most cases, in these celebrations, their relatives or friends enjoy these events with legal drugs such as alcohol and cigarette, without suffering physical damage at the time and without having the ability to project future damages [17, 19]. It is fundamental to position and guarantee values related to lifestyles health, as well as provide educational, recreational and family tools that allow young people to get away from this global problem [3, 20, 25, 44].

For example, self-control reduces drug use by helping young people to make better decisions [35], but this should be through programs that use interactive strategies such as recreational and playful activities, sports programs and computer programs [28, 37], those who seek to integrate prevention considering the various risks. When programs or interventions act on a certain range of risk behaviors in young people, this may trigger effects on other risk behaviors [12, 40], therefore there must be a diversity of factors towards different drugs [7], since it has been seen that promoting the use of these life skills programs turn out to be more effective than programs that do not use such approaches [43].

People who are at higher risk for drug-related outcome problems in general may receive more benefits from these interventions than children who are at lower risk [43]. School interventions based on the use of preventive cigarettes-alcohol have small results, especially when it comes to universal preventive interventions [34, 39, 55]; however, the school environment could be a good place for this, because it has been considered an ideal place to offer programs for the prevention of smoking and other drugs, since they universally involve young people of a wide range of age, including the ages in the that most young people start smoking. But school programs show relatively weak effects on the reduction of youth smoking, and these modest results have been explained by the strong effect of social influence in favor of smoking on and off school premises [2, 7, 17]. Because the social phenomenon of drugs is so complex, this requires the

continuous study of the range of factors that affect people of all ages and in all social settings.

The limitations of this educational project include that the instrument of the eight key questions only captures the student's opinion and does not measure students' knowledge about aspects of drug prevention, so it becomes a mechanism of assessment of the usefulness of the play, also allows to capture the comments that the students make but it cannot be verified that they are real facts. Due to the insecurity of the social context (drug trafficking) surrounding the schools where this quasi-experimental educational intervention was carried out, only parents were asked for permission to ask children's opinion questions, not knowledge or behaviors; therefore it was not possible to compare the answers of the students of each school by sex or age.

### Conclusions

This quasi-experimental community intervention through an educational project contributed in an interactive way through an artistic work carried out by university students of Pharmacy, so that the students of two marginal urban schools and of high risk for the drug phenomenon improve their learning experiences with a playful and experiential approach in aspects related to some life skills, as a complementary mechanism to current drug prevention programs in Costa Rica in primary schools. The educational project became a selective intervention in drug prevention for students at high risk of the drug phenomenon due to the social environment in which they develop, so they were shown the decision-making process and the consequences that can have in their lives the actions carried out.

### Acknowledgement

We thank the students of Pharmacy who made this community intervention, the students and staff of the schools visited

### Consent

The guidelines established by the Ministry of Public Education of Costa Rica were complied with.

### Ethical Approval

All bioethical aspects required by the Ministry of Public Education and the Social Security of Costa Rica for this type of intervention were fulfilled.

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