

# Preventing Youth Substance Use Using Creative Problem Solving-Cognitive-Behavioural Skills Enhancement Approach

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## Abstract

## Original Research Article

**Objectives:** The purpose of this study was to assess the effectiveness of creative problem solving-cognitive-behavioural skill enhancement approach on the prevention of substance use among youth. **Study Design:** A quasi-experimental study was used. **Methods:** The study involved 327 youth (mean age  $19.1 \pm 3.4$  years) of the Catholic Archdiocese of Ibadan, Nigeria in various secondary and tertiary institutions across Nigeria who gathered for an annual programme. A self-reporting questionnaire was administered pre and post eliciting information about participants' demographics, knowledge of effects of substance on the brain, attitude towards substance usage, decision making behaviour, satisfaction about the training/resolve to share information acquired and creative problem solving skills. 327 participants completed the pre-test but 208 (mean age  $19.2 \pm 2.9$ ) completed the post-survey. This accommodated a cross-sectional analysis of the results. Results reflect a comparison of all pre-evaluations with all post-evaluations. This prevented a pre- and post-evaluation paired-test analyses. **Results:** There is a significant difference in each post assessment result of the variables among participants: knowledge of how the brain helps make decision  $p(0.001) < .05$  level of significance; attitude towards substance use  $p(0.003) < .05$  level of significance; decision-making  $p(0.005) < .05$  level of significance; satisfaction and willingness to share information and skills acquired with friends  $p(0.003) < .05$  level of significance; creative problem solving skills  $p(0.002) < .05$  level of significance. **Conclusion:** A combination of creative problem solving and cognitive-behavioural skills enhancement influenced youth's decision against substance use. The result suggests that the enhancement technique is appropriate, effective and feasible for youth deterrence from substance usage encouraging further research.

**Keywords:** Youth; Substance use; Creative problem solving; Knowledge of how the brain works; Problem Ideas Plan (PIP); Cognitive-behavioural skills; Decision making.

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## INTRODUCTION

Substance use is among the leading contributors to the global burden of diseases with the use of alcohol and illicit drugs accounting for 5.4% of the global annual disease burden (WHO, 2009). In Nigeria, the commonly misused substances are tobacco, alcohol, prescription drugs, cough syrups, cannabis and non-prescribed hypnotics (Lagundoye & Adeyefa, 2017). In 2016 the global annual prevalence of any drug use among the adult population was 5.6% (United Nations Office on Drugs and Crime, 2018a). The first comprehensive, national survey to study the pattern of drug use in Nigeria revealed a considerably high level of past-year use of psychoactive substances in Nigeria, particularly the use of cannabis, cough syrups

(containing codeine or dextromethorphan) and the non-medical use of prescription opioids such as tramadol, and to lesser extent codeine, or morphine (United Nations Office on Drugs and Crime, 2018b). The past year prevalence of any drug use in Nigeria is 14.4% or 14.3 million among people aged 15 to 64 years. This shows that drug use in Nigeria is high when compared with the global average. The non-medical use of cough syrups containing codeine or dextromethorphan ranks third among commonly misused substances in Nigeria (United Nations Office on Drugs and Crime, 2018b). Further, an estimated 376,000 or 0.4% of the population aged 15-64, were projected as high-risk drug users, and nearly 90% of the high-risk drug users had regularly been using opioids like tramadol, morphine, codeine

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while the remaining had either used amphetamines or cocaine (United Nations Office on Drugs and Crime, 2018b). A major cause of substance misuse in Nigeria is the ease at which users buy them on the street or over the counter.

Adolescents and youth are the most at-risk population in terms of alcohol and substance abuse. For instance, studies conducted in Nigeria showed that the age of initiation of alcohol and substance use in the region is between mid and late adolescence (Adewuya, Ola, Coker, Atilola, Olugbile, Ajomale, et al, 2020) and that a large proportion of adolescents and youth in the country have experimented with alcohol/substance use at some point or the other (Dumbili, 2015). The consequences of substance abuse, especially among adolescents and youth or when initiated during adolescence or early adulthood, have been severally documented (Watt, Purdie, Roche & McClure, 2006; Wu, 2010). For instance, it causes morbidity and mortality apart from the adverse socio-economic consequences. Protracted usage of some drugs can lead to both short- and long-term alterations in the brain, which can cause mental health issues such as aggression, paranoia, depression, anxiety, and hallucinations (NIDA, 2017). Psychoactive substance misuse is associated with poor academic performance, addiction, sexually transmitted diseases, teen pregnancy, job instability and other injurious activities (Adebowale, Olatona, Abiola, Oridota, Goodman & Onajole, 2013). Also, 46% of respondents in the national household survey rate their perceived health status as being very good while those who had recently used tobacco, alcohol and other drugs reported poor health status compared to non-users (United Nations Office on Drugs and Crime, 2018a). In the same survey, those who reported simultaneous practice of using more than one substance reported lower (perceived) health status than other drug consumers.

There are different reasons why young people engage in alcohol and substance abuse, but one of the most important reason is the lack of appropriate knowledge about the implications of substance abuse (United Nations Office on Drugs and Crime, 2018b; Adebowale *et al.*, 2013; Volkow, 2007). Aside this, in the pathway towards a more problematic pattern of alcohol and substance use, is the distortion in thinking which comes with addiction, and which then facilitates choices which sustain addictive behaviour (Adebowale *et al.*, 2013). Research demonstrates that addiction is a type of disease influencing both the brain and human behaviour (Volkow, 2007). Humans are emotional beings who, in decision-making, go through feelings. The rational approach to decision-making becomes imperative, whatever the procedure adopted. Since psychoactive substance abusers do not seem rational in their decisions, a structured way of decision making that guides people in their choices would help prevent substance abuse. It is hypothesized that the acquisition

of creative problem solving and cognitive behavioural skills by the youth will, also, aid their decision-making process against substance abuse. This approach to breaking the addiction pathway has not been well utilized. This study, investigated the effects of creative problem solving skills, knowledge and attitude on youth decision-making about substance usage. It also sought to assess the effectiveness of training to enhance the capacity of the sample to develop skills for enhanced decision making in their daily lives and especially concerning substance use.

## MATERIALS AND METHODS

### Sample

This study was conceived in the course of the youth-congress, an annual event, organised by the Catholic Archdiocese of Ibadan, Nigeria, among adolescents and youth who are usually secondary and tertiary school students. A total of 450 youth from 49 parishes of the Catholic Archdiocese of Ibadan, Nigeria studying in secondary schools, polytechnics and universities participated. The parishes are located in rural, semi-urban and urban areas of Oyo and Osun States of Nigeria. Among the participating youth in the congress, about 327 (72.7%) participated in the present intervention study. A sample of 327 students comprising 136 (41.6%) female 159 (48.6%) male and 32 (9.8%) gender-not-indicated students completed the pre-evaluation.

### Research Design

**The study was quasi-experimental.**

### Procedure

Participants were administered pre- and post-surveys. Data collection and supervision of exercises were done by the researcher and six trained research assistants. A questionnaire measuring knowledge, attitude, behaviour, satisfaction, creative behaviour, gender and age was used. The participants were first trained on the effects of psychoactive substances, especially marijuana and alcohol, on the brain and decision making of adolescents and young adults. Teaching aids such as video, markers, sticky notes, flip charts and power points were used. The second training was on the acquisition of creative problem solving skills through a tool called Problem, Ideas, Plans (PIP). This measure was adapted to fit the context of the training. Consequently, some original items were removed. While some were reworded. The PIP is a funny, creative tool for teaching creative problem solving skills for children and adults (Reilly, 2015). It was a hands-on and an interactive intervention that used questions, answers and practical exercises to reinforce the contents taught. Relaxation techniques were also taught to help participants cope with stressors. 208 students comprising 93 (44.7%) female, 98 (47.1%) male, and 17 (8.2%) gender not- indicated students completed the post-evaluation. The average age of the students who completed the pre-evaluation was  $19.1 \pm 3.4$  years, and, for the post-evaluation,  $19.2 \pm 2.9$ . Age

was not indicated on some questionnaires (ranged 13-23).

### Measures

Each of the following aspects was assessed using four questions: knowledge, attitude, decision making, satisfaction/willingness to recommend information to friends and creative problem solving. Participants responded to a five-point Likert type scale: 1 = Strongly Disagree, 2 = Somewhat Disagree, 3 = Neutral, 4 = Somewhat Agree, 5 = Strongly Agree. The

questionnaire required participants to enter the first three letters of their first and last names in order to collate results between the pre- and post-evaluations. Identification codes were missing for 22 out of 327 pre-evaluations and 29 out of 208 for the post-evaluation. The results of this study are therefore, cross-sectional. Rather than matching evaluations within participants, results reflect a comparison of all pre-evaluations with all post-evaluations. This has prevented a pre- and post-evaluation paired-test analyses.

**Table 1: Respondents' Variable Comparisons for the Evaluation Questions**

	Pre-Evaluation	Post-Evaluation	Difference	p-value
<b>Knowledge</b>				
I know the process of how the brain helps me make decisions.	3.9 ± 1.2	4.4 ± 1.1	0.5	< .0001
I know how alcohol use can affect how the brain works.	3.8 ± 1.5	4.3 ± 1.2	0.6	< .0001
I know how drug use, such as marijuana, affects how the brain works.	3.6 ± 1.6	4.3 ± 1.3	0.7	< .0001
I know how different quantities of alcohol and drugs affect the brain.	3.6 ± 1.4	4.0 ± 1.4	0.4	.001
<b>Attitude</b>				
Experimenting with alcohol and drugs is part of growing up for teenagers.	1.9 ± 1.3	2.3 ± 1.6	0.4	.003
Programs that teach about substance use are not really helpful for teenagers.	2.5 ± 1.6	2.4 ± 1.6	-0.1	ns, .55
Occasional drinking is okay for teenagers, as long as they do not do it every day.	2.5 ± 1.5	2.3 ± 1.6	-0.2	ns, .29
Drinking is not as bad for you as using other drugs.	2.3 ± 1.4	2.3 ± 1.5	0.0	ns, .69
<b>Decision to act better</b>				
I will always strive to make good decisions about everyday things.	3.7 ± 1.2	4.0 ± 1.1	0.3	.005
I am now better informed to make good decisions about not using alcohol or drugs.	4.1 ± 1.3	4.3 ± 1.2	0.2	ns, .14
I would like to learn tips for making better decisions.	4.4 ± 1.1	4.4 ± 1.2	0.0	ns, .68
My friends influence the choices I make about using alcohol or drugs.	2.1 ± 1.4	2.2 ± 1.5	0.1	ns, .37
<b>Satisfaction/Willingness to Recommend to Friends</b>				
I believe the information presented was helpful, and I would likely recommend it to a friend.	4.1 ± 1.3	4.3 ± 1.2	0.2	.03
<b>Creative Problem Solving</b>				
I now know that when facing a challenge, I can use a system to generate lots of possible solution.	3.4 ± 1.3	3.8 ± 1.3	0.4	.0002
I understand and know how to use creative problem solving.	3.5 ± 1.2	4.1 ± 1.2	0.6	< .0001
I learned a new problem solving approach using divergent and convergent thinking skills.	3.2 ± 1.3	3.9 ± 1.2	0.8	< .0001
I learned how problem-solving skills are related to mental health and wellness.	3.5 ± 1.4	4.2 ± 1.1	0.7	< .0001

## RESULTS

Table 1 shows independent sample t-tests conducted to examine differences between pre- (n=327) and post-evaluation (n=208) results for knowledge, attitude, decision making, and satisfaction/willingness to recommend information to friends. It also presents the results of creative problem solving skill at (p<.05) significant difference.

### Knowledge

Pre- versus post-evaluation scores revealed a significant improvement in knowledge after the intervention (p<.05) on how the brain makes decisions, how alcohol and marijuana and different quantities of both can affect the brain.

### Attitude

Other than a higher tendency to concur that experimenting with alcohol and drugs may be part of growing up for teenagers, there was no significant change in attitude towards substance use. The group that completed the pre-evaluation had significantly lower scores (strongly disagree) than those who completed the post-evaluation (somewhat disagree) regarding attitude to experimenting with drugs and alcohol as part of growing up. This difference reflects the discrepancy between the numbers of participants that completed pre- versus post-evaluations. There were no differences between pre- or post-evaluations. All indicated 'somewhat disagree' that programmes are not helpful, that occasional drinking is all right and that drinking is not as harmful as other drugs.

### Decision Making

The post-evaluation showed significantly higher scores; 'somewhat agree' compared with 'neutral' for pre-evaluation and for how well they think they make decisions after the presentation. There were no differences. All indicated 'somewhat agreed', meaning that they always make the right decisions about drug and alcohol use. However, they would like to learn tips for better decision-making but somewhat disagreed that friends influenced their alcohol and drug use, regardless of pre- or post-evaluation.

#### ***Satisfaction and willingness to share information received with friends and peers:***

There was a significant increase in scores from pre- to post-evaluation for satisfaction with the training. The change reflects the fact that the students thought the intervention was beneficial and that they would recommend the information to friends. The idea behind surveying the expected satisfaction level before the intervention could be explained because mental issues are still frowned at or unspoken about in many countries. As such, acceptance is low. Interventions like this study demand that participants with a negative attitude need their expected satisfaction with the training assessed before and afterwards.

## **DISCUSSION**

Learning as a consequence of exposure to any form of training has continued to encourage different kinds of teaching in various areas of life. This study has proved that creative problem solving training is effective in the prevention of substance abuse among youth. The global efforts geared towards preventing substance abuse with evidence-based approach finds support in the outcome of this study. The fact that the participants were students proves that school-based substance abuse prevention programmes will not only succeed at different levels of secondary education but also at the tertiary levels (Botvin, Griffin & Williams, 2015).

This study tested the effectiveness of a substance abuse prevention programme for deterring substance use among youth in secondary and tertiary institutions of learning. The preventive intervention programme and the self-reporting measures used were designed to be developmentally appropriate for the group. One of the goals of the intervention was the acquisition of creative problem solving skills by the participants. Problem solving is an essential strategy in the treatment and prevention of mental health as well as a coping skill to promote wellness. For instance, the PIP (Problem, Ideas, Plan) is a development from the creative problem solving (CPS) process which otherwise might have been difficult to teach within the context and timeframe allowed for the intervention (Reilly, 2015; Puccio, Mance, Switalski & Reali, 2012). The use of PIP became fun and made it easier to break down the more complicated CPS structure to positively influence the decision of the participants to

creatively decide against substance abuse. PIP also promotes the decision-making skills of social, emotional learning by facilitating the creative (divergent) and critical (convergent) thinking skills needed for survival in the 21st Century (Reilly, 2015). Furthermore, many factors which becloud the sense of judgement affect an individual in their decision to use or abuse drugs. Consequently, conscious decision-making can effectively function when one is dealing with only few alternatives as it would be possible to concentrate on one thing at a time using some rational approaches (Vaezipour, 2013). This rational approach to decision making is what PIP provides.

The recent UN report (UNODC, 2018) revealing that majority of young Nigerian drug users learn about psychoactive substances from peers makes this study timely. Learning, as a result of exposure to a body of information, contributes to outcomes. This study enabled the participants to increase their knowledge of the harm that can result from psychoactive substance misuse. The knowledge also facilitated a better attitude towards the habit of drug use. Such an attitude becomes imperative in the context of reported cases of substance abuse by youth in Nigeria and globally (Botvin, Griffin & Williams, 2015; Danjuma, Ibrahim & Omoniyi, 2015). It means that concerted efforts should be made by all stakeholders to engage in more enlightenment campaigns to teach the youth the consequences of substance usage and misuse. For instance, the decision to take drugs is initially voluntary. However, an individual's self-control becomes impeded when drug abuse takes over. Brain imaging studies from drug-addicts show physical alterations in the areas of the brain that are critical to decision-making, judgement, memory, learning and behaviour control. This led scientists to conclude that the changes alter the functions of the brain and may elucidate the compulsive and destructive behaviours of addiction (Volkow, 2007). Such pieces of training will increase knowledge and engender the right attitude towards substance misuse among the youth.

Substance abuse remains a critical issue in Nigeria and across the world. It begins during the adolescent years and progresses into adulthood. Preventive studies must concentrate on stopping the onset and early stages of usage and abuse. For a country like Nigeria, with limitations in the number of mental health experts and financial resources, the study poses a challenge to stakeholders in the health industry to collaborate using affordable preventive methods like this study (Abdumalik & Gureje, 2017). The present study has its limitations, in spite of its strengths. The first is the inability to do individual t-test analysis of the participants due to the absence of complete ID codes and other demographics on some questionnaires. The fact that not all who filled the pre-survey completed the post-survey was a limitation that prevented a more

detailed analysis of the potential data. It was impossible to test for variations by gender, age or specific substances. There is no follow-up data to draw conclusions about the durability of the prevention effects on the population. Grouping secondary school students with students of tertiary institutions for the same programme might have affected the outcome due to cultural considerations about age. Obialo (2018) reported emic dimensions when considering student outcomes in Nigeria. Age differences should, therefore, be factored into future researches that might replicate the present study. These limitations call for future studies to reveal more data about the strengths of the intervention.

## CONCLUSION

This work demonstrates the effectiveness of a prevention approach to substance use. The intervention included knowledge and creative skills for deciding on repelling attraction for substance usage among youth. The outcomes reveal the effectiveness of the intervention in instilling other psychosocial skills in the participants. What this implies is that the study is replicable. The participants who expressed willingness to share the information learnt and skills acquired became potential trainers among peers. This study is an approach aimed at enhancing prevention methodologies in substance usage and abuse because an improvement in the comprehension of the fundamentals of drug addiction will enable people to make informed choices that will impact their lives positively. Moreover, it will enhance the pursuit of strategies that will eliminate or reduce drug abuse or addiction and improve people's wellbeing all over the world, thus reducing the global burden of disease. Stakeholders are thus advised to explore the outcomes of this study.

## Author Statements

This study was approved by the appropriate ethics committee of the Catholic Archdiocese of Ibadan, Nigeria, through the Directorate of the Archdiocesan Youth Apostolate. The participants who were youth of the Catholic Archdiocese of Ibadan were well informed of the study ahead of time and gave their informed consent witnessed by each participant's parish priest. The participants' parents also gave prior authorization before the participants were finally granted the endorsement to attend the programme by the participants' respective parish priests.

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**Competing Interests:** None declared

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