Development and pilot-testing of a skill-based intervention to prevent psychoactive substance use among college students: A study from Bangalore, India

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Abstract

Background: Psychoactive substance use among college youth is increasing in low- and middle-income countries like India. However, there are few systematically developed interventions for this vulnerable group. Aim: The aim of this study was to develop a skill-based intervention to prevent substance use among college students (or enable them to quit, if already initiated use). Method: The skill-based intervention was informed by focus group discussions with college students regarding the kind of help they perceived would be useful. The intervention was pilot-tested for its appropriateness and acceptability in this population, and revised based on their inputs. Results: The feedback received from the students was incorporated and the intervention was suitably revised. The final intervention adopted a disease prevention and health promotion approach, by addressing psychoactive substance use as a risk factor for several major illnesses, and providing practical guidance on how to overcome use. The intervention consisted of four sections: (i) Health effects of substances, with realistic depictions through computer graphics (e.g., to illustrate arterial blockage, brain shrinkage, lung damage, erosion of gastric mucosa, impaired sexual performance, premature aging); Clarification of Myths, Providing Medical Facts, (ii) How to Overcome Substance Use, with practical strategies for quitting, (iii) Quitting Substance Use as part of a Healthy Lifestyle, (iv) Conclusion, portraying life after quitting substances, with motivational messages. Conclusion: The skill-based intervention received positive feedback regarding its applicability and acceptance among college students. An experimental trial can be planned to examine the efficacy of the intervention in bringing about improvement in specific outcomes.

Keywords: College students, pilot study, psychoactive substance use, skill-based intervention

Introduction

Adolescence and early adulthood are critical phases of life, with tremendous physical, psychological, and emotional changes. In addition to the internal changes, young people are often subjected to various external forces (e.g., high parental expectations), which can drive them to make the wrong choices or decisions to cope, including the use of psychoactive substances.¹ Prior studies among urban college youth in India indicate that many use substances due to peer influence or to obtain stress relief.²,³ Easy availability of drugs further fuels use. Thus, there is an urgent need for substance use prevention programs targeting youth, as substance use early in life can put the youth at higher risk for long-term complications.⁴ Several youth-based interventions have been designed and implemented in developed countries.⁵-⁷ However, there is scarce

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evidence from low- and middle-income countries (LMICs) about suitable interventions and their evaluation in this population. Against this background, the current work describes the development of a multi-component skill-based intervention for college youth, which was pilot-tested among college students in Bangalore, South India. Many young people migrate to this city for education and job opportunities. Bangalore has large liquor distilleries and volume of sales, and thus, there is greater access and opportunities to use alcohol and other substances.[9]

We developed the skill-based intervention following focus group discussions with college students to assess their needs,[9] and pilot-tested the intervention among the students. The aim of the skill-based intervention was to provide established medical facts, along with required strategies to prevent or quit use, so that college youth have the right information to make informed decisions which support their health, safety, and well-being. Since the approach used in this intervention is based on primary prevention and health promotion, it can particularly be of value to primary care providers in community level settings. Further, health professionals involved in family care can use this intervention to educate family members, who can in turn support young people, so that they do not drift toward substances.

### Materials and Methods

The study was approved by the Institute Ethics Committee (No.NIMH/DO/IEC (BEH. Sc. DIV)/2017)).

### Development of the skill-based intervention for college students

This was informed by the following:

(a) **Review of existing literature** on interventions to prevent/reduce psychoactive substance use among youth, which focused on diverse approaches, that is, computerized/digital skills training,[10] family-based interventions,[7,11] others.[5,6,2,18] This literature is from high-income countries; there is acute scarcity of interventions from LMICs, despite increasing use of substances. In India, only three studies could be identified: effectiveness of an intervention for high school students to reduce tobacco use and teach life skills,[14] smoking cessation advice for 8th–10th graders for quitting smoking,[16] nurse-led on-campus brief intervention for college students to reduce hazardous alcohol use.[18]

The literature led us to focus on the following: (a) development of an intervention which emphasizes on important facets of a youngster’s life, that in turn have an overall bearing on health, (b) preventive care, which continues to be the best recommended practice.

(b) **Focus group discussions (FGDs) with college students:** The development of the skill-based intervention was heavily informed by the results of FGDs which we conducted earlier with college students.[9]

(c) **Inputs of subject experts** through detailed discussions; they suggested that the following content should be included in the intervention:

- Information on health impact of substance use, including cannabis; clarification of myths related to substance use.
- Skill-building strategies (e.g., assertive communication, stress management).
- Promotion of self-esteem.

### Pilot-testing of the skill-based intervention

The college students who participated in the FGDs[9] were invited to participate in the pilot-testing of the intervention, since their inputs had been instrumental in its development. Twenty-three of the original 38 college students agreed. Due to coronavirus pandemic 2019 (COVID-19) restrictions, the pilot-testing was conducted through Google Meet, after obtaining electronic consent. The intervention was presented to the students in six sessions, each lasting for 45–60 min. After the 23 students had provided their inputs (via Google Forms), additional students were invited to participate, until a total of 50 students had evaluated the intervention. One incomplete Form was discarded; thus, the inputs of 49 participants were available for analysis.

### Evaluating the intervention

**Quantitative evaluation:** Criteria to rate each section of the intervention were developed, validated by experts, and presented to five of the students for inputs. We then proceeded with the pilot-testing after making minor changes in the wording of some items [Tables 1-4]. At the end of each session, the students were required to record their responses to the criteria in a Likert-format (Strongly disagree-0, Disagree-1, Neutral-2, Agree-3, Strongly Agree-4).

**Qualitative evaluation:** To gather more detailed feedback from the students on the intervention, a semi-structured guide was developed and content-validated by subject experts. It was then pretested on 10 college students and finalized. The questions focused on the relevance, practical usefulness of the content in the intervention for college students, suggestions for improvement.

### Table 1: Students’ feedback regarding Section 1 of the intervention (Health impact, clarification of misconceptions and providing medical facts) (n=49)

| Evaluation statements | Agree (%) | Strongly agree (%) |
|-----------------------|-----------|--------------------|
| Content covered what I wanted to know about health impact of substances | 15 | 85 |
| Content is relevant and important to college students | 10 | 90 |
| Clarity has been provided on the misconceptions about substances commonly used by college students | 18 | 82 |
| Language is simple and understandable | 20 | 80 |
| Visuals are clear | 18 | 82 |
| Visuals are aesthetically pleasing | 12 | 88 |
| Length of the content is appropriate, so that it sustains the interest of the students | 10 | 90 |
Analysis

Data from the students’ responses to the evaluation criteria were checked, entered, and verified again for accuracy. Summary statistics were computed using SPSS 24. Students’ responses to the semi-structured questions were analyzed as follows: the first and second authors listened carefully to the Google Meet video recordings and transcribed the responses verbatim. Then they read through the printed transcripts thoroughly without attempting any categorization of responses at this stage. Next, the semi-structured guide questions were used to manually code and group the students’ responses across the six sessions to identify main themes. All the authors went through the codes and reached a consensus. The findings were then synthesized, interpreted and reported, using verbatim narratives whenever possible.

Results

(A) Content of the skill-based intervention: The skill-based intervention adopted a health promotion approach, by addressing psychoactive substance use as an important risk factor for several major diseases, and how substance use can be prevented or overcome.

The intervention consisted of four sections:

(i) Adverse health effects of substances, with focus on Alcohol, Tobacco, Cannabis: These were illustrated through realistic computer graphical depictions (e.g., arterial blockage, brain shrinkage, lung damage, erosion of gastric mucosa, impaired sexual performance, premature aging). The impact of drunken driving was illustrated with examples and images.

| Table 2: Students’ feedback regarding Section 2 of the intervention (How to overcome substance use) (n=49) |
|-------------------------------------------------|---------------|---------------|
| Evaluation statements                          | Agree (%)     | Strongly agree (%) |
| The content will help to motivate college students to reduce or quit substances. | 26             | 74             |
| The content is practical, logical, and relevant to college students. | 24             | 76             |
| The content will enable college students to understand how they can reduce or quit substance use. | 22             | 78             |
| The content will enable students to communicate their desires and wants in such a manner that they don't let others hurt them, and they don't hurt others as well. | 30             | 70             |
| Language is simple and understandable.         | 12             | 88             |
| Visuals are clear.                             | 16             | 84             |
| Visuals are aesthetically pleasing.            | 10             | 90             |
| Length of the content is appropriate, so that it sustains the interest of the students. | 20             | 80             |

| Table 3: Students’ feedback regarding Section 3 of the intervention (Healthy lifestyle) (n=49) |
|-------------------------------------------------|---------------|---------------|
| Evaluation statements                          | Agree (%)     | Strongly agree (%) |
| The content will enable college students to comprehend that quitting substance use is part of a healthy lifestyle, which can help to prevent various illnesses. | 6              | 94             |
| The content will enable students to learn and practice how stress can be managed in a constructive manner, without using substances. | 20             | 80             |
| The video portraying problem-solving strategies will enhance students’ comprehension of problem-solving skills | 5              | 95             |
| The content will enable students to learn how to solve problems in a step-wise manner, rather than turning to substances to avoid facing them. | 15             | 85             |
| The students will be able to understand that making productive use of time is important to avoid substance use. | 8              | 92             |
| Based on the content presented, students will be better able to plan and organize their time. | 16             | 84             |
| The content will help students to understand the importance of healthy eating for overall physical and mental health, including for reducing the craving for substances. | 5              | 95             |
| The content will enable students to adopt healthier eating patterns as part of leading a healthy lifestyle. | 14             | 86             |
| Language is simple and understandable.         | 5              | 95             |
| Visuals are clear.                             | 5              | 95             |
| Visuals are aesthetically pleasing.            | 5              | 95             |
| Length of the content is appropriate, so that it sustains the interest of the students. | 10             | 90             |

| Table 4: Students’ feedback regarding Section 4 of the intervention (Conclusion) (n=49) |
|-------------------------------------------------|---------------|---------------|
| Evaluation statements                          | Agree (%)     | Strongly agree (%) |
| The content will motivate college students to pass on the message and share with others what they have learnt through this intervention. | -              | 100            |
| The video portraying life after quitting substances will help students to: | |               |
| Have a realistic view of self, based on their strengths and weaknesses | 12             | 88             |
| Value themselves the way they are, without comparing themselves with anyone else | 16             | 84             |
| Understand that success just means giving their best in all that they do | 10             | 90             |
| Language is simple and understandable.         | 8              | 92             |
| Visuals are clear.                             | 12             | 88             |
| Visuals are aesthetically pleasing.            | 10             | 90             |
| Length of the content is appropriate, so that it sustains the interest of the students. | 4              | 96             |
(ii) How to Overcome Substance Use: Based on the inputs of the focus group participants,\textsuperscript{9} as well as subject experts, that the intervention should be skill-based, this section comprised of practical strategies for quitting use, with the help of scenarios identified during the focus groups, managing craving using individually tailored recovery calendars, recognizing and managing red-flag signs, dealing with peer pressures by communicating one’s needs assertively.

(iii) Quitting Substance Use as part of a Healthy Lifestyle: Given that quitting substance use is closely linked to how one responds to life’s challenges, this section focused on cultivation of a healthy lifestyle, including how to deal with stress and solve problems constructively, manage time, and inculcate healthy eating habits. The lifestyle approach is supported by prior literature from overseas\textsuperscript{14,19} and from India, where there is increasing emphasis on addressing risk factors – including psychoactive substance use – in an integrated manner, for non-communicable disease prevention.\textsuperscript{20,21}

(iv) Conclusion: This section consisted of a video portraying life after quitting substances. The aim was to help young people develop a realistic concept of what success means, have realistic expectations, and appreciate themselves for what they are.

The above four sections were presented through animated PowerPoints in video format with supporting images and illustrations. Videos were used to demonstrate specific skills (e.g., problem-solving).

(B) Findings of pilot-testing of the intervention: Mean age of the students who participated in the pilot-testing (N = 49) was 19.71 years (SD=1.90 years), and 55% were females.

Students’ evaluation of the intervention on the criteria: None rated the criteria as ‘strongly disagree’ or ‘disagree’. Hence, the percentage of students who rated as ‘Agree’ or ‘Strongly agree’ are presented in Tables 1–4.

Students’ inputs and feedback on the intervention: We organized and compiled the students’ inputs and feedback as follows:

Section 1 of the intervention (Health impact, clarification of misconceptions, providing medical facts):

- Importance and relevance of the content: The students mentioned that the content is highly relevant to today’s youth, and that several of the effects of alcohol, including drunken driving, are an “eye-opener”:

20-year-old, male: “Most young people do not know these facts, except to generally have heard that alcohol and tobacco are harmful. We have seen traffic notices saying ‘Drunken driving is dangerous’, but I do not think we took it seriously, until today.

The content on myths and misconceptions was considered by the students as valuable, as they said that several of their friends use substances to forget problems, socialize better, express love to a girl/boyfriend, build muscles, look better, etc. They noted that this section provided important clarifications to these popular misconceptions in a realistic manner.

- Clarity of content and presentation style: The students generally opined that the language is simple, the slides have visual appeal with clear illustrations, which conveys the message with clarity.

- Suggestions provided by the students to improve Section 1:

“Content on other drugs could be added, like cocaine, injecting drugs” (37%).

“How to handle internet (including pornography) addiction could be included” (25%).

“Soften the graphics a bit, so that students don’t get too scared by the health effects of substances” (6%).

Section 2 of the intervention (How to Overcome Substance Use):

- Relevance and practical usefulness of the content: All the students said that the content realistically portrayed situations that students usually face, and ways to address them. They felt that the content can be used as self-help material by the students to quit substance use.

22-year-old, male: “Most of us know several students/classmates, who wanted to quit smoking or drinking, but did not know how. The content presented to us today will help them learn some practical ways in which they can try quitting use again, and this time they are more likely to succeed”.

- Clarity and presentation style: The students commented that the content is supported by illustrations which reiterate the message strongly, besides sustaining interest.

- Suggestions provided by the students to improve Section 2: “Add a success story of someone who has quit alcohol or tobacco, that will be really inspiring” (71%).

Section 3 of the intervention (Quitting substance use as part of a Healthy Lifestyle):

- Importance and relevance of the content: All the students felt that this section will be especially motivating for students, as it will help them to understand that quitting substances is about health; it’s a reward, not punishment. The students also emphasized that the content on stress management and problem-solving will provide a clear understanding on how to deal with life issues without substances, since substances only compound problems. They noted that the video demonstration is a valuable addition, as it explains the steps of problem-solving clearly.
The content on healthy eating was appreciated by the students. In the words of a 19-year-old girl, “From this session, young people will understand the numerous health food options available, and that eating right can be real fun”. The students also commented, “If youngsters plan their eating as specified in this session, it will be easier not to think of alcohol”.

The students’ overall impression was that this section will help young people realize that life can be exciting without alcohol or drugs.

- Clarity of content and presentation style: The students said that the content has plenty of visual appeal, and will help young people to practise a healthy lifestyle.

- Suggestions provided by the students to improve this section:

  “The actors’ dialogues aren’t very audible, the sound should be worked on” (100%).

  “The problem-solving video length should be reduced” (41%).

  “Provide sub-titles to the problem-solving video” (31%).

Section 4 of the intervention (Conclusion): This section was considered by the students as a fitting culmination to the intervention. As told by a 21-year-old boy, “It will help young people to run the race well, by giving their best, and not by comparing with others”.

Overall feedback: The students expressed that they have been personally benefitted from viewing the intervention, and that they will also be able to help others, as many of their friends are struggling to give up substances. The following is a verbatim quote from the twenty-three students who had participated in the focus group discussions: “At that time we thought this is just like another lecture or program we get to see in the college. But now we see that the content is very different, compelling. We are glad we took part in the focus groups last year, and we are fortunate to have been included in this group to give our feedback on the intervention”.

All the students asserted that the intervention is the need of the hour, and that “it should be made available to college students at the earliest, as it will truly benefit them”.

Suggestions by the students which were common to all the Sections:

“Add a background voice which can explain the content, and convey a more meaningful and powerful message”.

“Present the power-point slides as videos with background music, to make it more appealing”.

“Increase the slide duration, giving time to grasp the content”.

(C) Finalization of the intervention:

The following changes were made to the intervention after the pilot-testing:

- The content in each section was made crisper.
- Voice over was added to the PowerPoint presentations.
- All the presentations were converted to video format after increasing the slide duration.
- Sub-titles were added to the problem-solving video, and its length was reduced.
- Sound was enhanced by dubbing separately.
- Success story of a client availing the weekly substance use management services we conduct in the community was included (the client provided written informed consent if his face was blurred to maintain anonymity).

What was not incorporated:

- Content on other addictive drugs and internet addiction was not included, as it is beyond the scope of this study.
- Depictions of adverse effects of substances were not altered as they presented the medical facts, and the objective was not to “scare” the students.

At this stage, the finalized skill-based intervention, which is a digital learning resource, was named as the LiFE, an acronym for “Lives Fulfilled, Empowered”.

Discussion

Existing literature in India related to psychoactive substance use among college students has largely been in the form of epidemiological surveys and cross-sectional studies in educational campuses and the community. However, literature reporting the development and testing of structured interventions among college students is scanty. The present study has reported the development of a comprehensive intervention, viz. LiFE, a digital resource to empower college students to not start substances in the first place, or quit/reduce use, if already using. The aim was that, after being exposed to the LiFE, the students would make informed choices or decisions, and be able to implement them in their lives, based on authentic information that best supports their health and well-being.

The LiFE is currently being distributed to colleges in Bangalore. We are beginning to receive very positive feedback, with the college administrators letting us know that the LiFE will be made part of the student development program. Further, all the four sections in the LiFE have been placed in different labelled folders, with each folder containing further clearly labelled digital files. The colleges are finding this feature particularly useful, as the college teachers are conveying that they are able to pick and play/replay specific files to some students/student groups, based on their knowledge of the students’ emotional states or life situations.

The LiFE was developed in English and was pilot-tested among college students only in Bangalore, which may restrict
the generalizability of the study’s findings. However, the key strengths of the LiFE include its development based on in-depth exploration of college students’ perspectives about the kind of help they need to prevent or quit substance use, subsequent pilot-testing among the students, and further refinement, to ensure that the LiFE is culturally relevant and applicable to this population. Therefore, given the rising use of psychoactive substances among college students in India and the paucity of interventions, the LiFE can be considered a useful resource at this stage.

The current findings also highlight the scope for carrying out longitudinal research to test the efficacy of the LiFE in terms of specific outcomes among the students, that is, increasing knowledge, shaping attitudes, increasing motivation, and self-efficacy to quit substances, reducing quantity, and frequency of substance use. Future work should also explore the applicability of the LiFE to college students in semi-urban and rural areas, with translation into other languages (or adding sub-titles).

In summary, a skill-based intervention to prevent psychoactive substance use among college students was developed, pilot-tested and finalized. Feasibility studies involving substance use interventions for adolescents have been conducted overseas. However, for India, the present study is the first known study reporting the development of the skill-based intervention based on the college students’ felt needs, and subsequent pilot-testing to evaluate its appropriateness, feasibility and acceptability.

The LiFE can be specifically useful to primary care personnel, as they can use it to provide primary prevention interventions through community youth outreach programs. This can be possible after suitable training of the primary health care providers, who can in turn train multiple stakeholders in the community (e.g., teachers, college peer volunteers). Their services can be enlisted to conduct workshops and training programs periodically in schools and colleges. Furthermore, in our earlier work with college students, unrealistic expectations from parents, poor familial role models, distrust of family members, cultural gender insensitivity, were cited as important reasons for substance use among college youth. The students had also stressed the need for involving parents in the intervention. In light of this, family health care professionals can use the LiFe to provide psychoeducation to family members, so that they build an appropriate home environment for youngsters, which can prevent them from using substances. Such measures can raise awareness and prevent severe adverse effects and long-lasting complications associated with psychoactive substance use among young people in the community.

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Conflicts of interest
There are no conflicts of interest.

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