Research Article

# Effect of an Educational Program on Stakeholders' Awareness About Risks of Cannabis Use in Sudan: A Quasi-Experimental Study

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## Abstract

**Background:** This study assesses stakeholders' awareness level of Cannabis use and the effect of an educational program on their awareness in Kabkabiya city of Sudan.

**Methods:** This quasi-experimental research was conducted using a pre- and posttest design between July and November 2018. A total of 203 stakeholders were recruited in the study using a convenience sampling technique. First, using a self-reported questionnaire, the pretest data were collected before the intervention. Then, the participants underwent an educational program intervention in the form of lectures and group discussions. At the end of the program, the participants were subjected to the posttest using the same questionnaire. Data were analyzed using descriptive and inferential statistics.

**Results:** The results showed a poor to moderate level of awareness about Cannabis use among stakeholders. A statistically significant increase in the stakeholders' awareness levels was found after the educational program intervention with a large effect size in awareness ($z = -12.299$, $P = 0.001$, $r = 0.91$). The results also showed that the participants who graduated from university had a significantly higher level of awareness than others at pre- and posttests stages ($P =< 0.001$).

**Conclusion:** The educational program intervention effectively improved stakeholders' awareness about the risks of Cannabis use. This study suggests providing ongoing health education for the public and focusing on individuals with lower educational levels to increase awareness of the risks of Cannabis use.

**Keywords:** educational program, awareness, Cannabis use, community health, Sudan

## 1. Introduction

Cannabis is one of the most commonly abused illicit drugs in a global context [1–3]. The word "Marijuana" comes from the "*Cannabis sativa"* plant [4, 5]. Cannabis products come in three main forms including the herb (Marijuana), resin (Hashish), and oil (hash oil) [6]. Hashish is the processed product of Marijuana and can be smoked or ingested [7]. For centuries, Marijuana has been used in many cultures to treat disorders that show moderate treatment such as chronic pain, spasticity, and chemotherapy-induced nausea and vomiting [8, 9]. However, recent evidence denotes that Marijuana use has several short- and long-term adverse effects on health outcomes such as neurological problems, cognitive deterioration, respiratory symptoms, and cerebrovascular and cardiovascular disorders [10]. Although evidence shows that Marijuana or Cannabis in general has side effects on human health, teenagers continually consume it for recreational purposes [11, 12]. Cannabis is the third most frequently used substance worldwide after alcohol and tobacco. Statistics show that in 2018, approximately 3.9% of the world's individuals had used Cannabis for nonmedical reasons [5, 13]. Studies report that adolescents who are marijuana users have an increased risk of other substance use, injury, violent behaviors or victimization, and sexual risk behaviors compared with nonusers [14]. Some research evidence claims that Cannabis use is associated with low socioeconomic status, the male gender, smoking, and heavy drinking [15].

In Sudan, the magnitude of substance use might be a growing problem, however, evidence about Cannabis use is still lacking [16]. Generally, the individual's perceptions of the risks associated with substance use play a critical role in making their decision to engage in it [17]. Furthermore, studies have shown that people who are aware of the high risk of substance use such as Cannabis are generally less likely to use it, and vice versa [18].

Stakeholders and stakeholder groups not only play a key role in the formulation and delivery of policy, but they are also important for knowledge and policy transfer [19]. The term stakeholders narrows the focus from the whole community to those in the community who have an interest in health concerns such as Cannabis use. This allows researchers to consider the appropriate groups and individuals that should be included in this context. Thus, researchers should investigate stakeholders' knowledge about Cannabis use and its associated risks. Stakeholders include people, groups, communities, and organizations that can have a direct and indirect influence on the decisions and activities during a policy and project life cycle [20–23]. The incentive to include stakeholders is based on the belief that stakeholders hold different types

of knowledge, which are complementary to science and public management [24]. Therefore, their awareness and perceptions of the risks associated with Cannabis use are vital in implementing awareness programs.

Although the prohibition on adult Cannabis use has decreased the prevalence of Cannabis use in young adulthood [5], there is still a paucity of data recorded in Sudan about the level of stakeholders' awareness about the risks associated with Cannabis use. Therefore, this study aimed to measure the impact of an educational program on stakeholders' awareness of the dangers of Cannabis use in Sudan, specifically in the Kabkabiya district. In addition, the study aims to find out the differences in the level of stakeholders' knowledge based on their demographic characteristics. The study findings may help health authorities to adopt awareness campaigns and programs for adolescents and raise awareness about the side effects of Cannabis use.

## 2. Materials and Methods

### 2.1. Study design, setting, and participants

The researchers utilized a quasi-experimental design on one group of participants (pre- and posttests). They conducted this study in the Kabkabiya district which is located in the Northern Darfur State, Sudan during the month of July 2018. After obtaining an Institutional Review Board (IRB), the researchers recruited the participants through a written invitation via administrators to participate in the study. This study included a variety of stakeholders from different educational and community-based service groups from the Kabkabiya district. The stakeholders included a variety of group members from the Teachers Syndicate, General Union of Sudanese Women, Sudanese Society for Drug Control, Sub-Football Association, High School Students Unions, and policemen.

The study included stakeholders who had not previously engaged in any program related to Cannabis smoking and were willing to participate in the study. Other inclusion criteria were stakeholders who were still in active positions and were aged 18 years or more. Those who refused to participate or who did not show up during the data-collection phase were excluded. Additionally, those who did not complete the program were also excluded from the study.

## 2.2. Sample size and technique

The study sample was selected using a convenience sample technique. A power analysis was conducted using G*Power 3.1 to determine a sufficient sample size using an alpha ($\alpha$) of 0.05, a confidence level of 95%, a power of 0.80, and a medium effect size (Cohen's $f^2$) of 0.25. Based on the aforementioned parameters, the minimum desired sample size for this study was 240 participants. Thus, the researchers invited 250 participants as they were aware that some invited participants may not fulfill the requirements or may drop out of the study.

## 2.3. Measurements

### 2.3.1. Development of the questionnaire

To measure the impact of an educational program on stakeholders' awareness of the risks of Cannabis use, a self-administered questionnaire was developed in the English language based on the literature review. Then, the questionnaire was translated into Arabic language because it is the country's primary language. Three experts verified the questionnaire's content. The researchers made minor changes to the original questionnaire according to the experts' comments. Then, the instrument was piloted on 30 participants to check the feasibility and the time required to complete the questionnaire for each respondent. According to the pretest findings, the researchers made necessary corrections for feasibility. The researchers excluded the participants enrolled in the pilot test from this study.

In this study, the questionnaire had an adequate internal consistency of reliability with a Cronbach's Alpha ($\alpha$) of 0.77.

### 2.3.2. The components of the questionnaire

The questionnaire consisted of three parts. The first part consisted of four items to collect data about the demographics of the participants, such as age, gender, education, and marital status. The second part was designed to measure the level of knowledge about Cannabis use among stakeholders. This part consisted of seven items on a five point-Likert scale where the points were interpreted as 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, and 1 = strongly disagree. The total mean scores for knowledge were calculated before and after the education program to evaluate the difference and effects of the program.

### 2.3.3. Development of the educational program

Following an in-depth literature review and a validation of five experts in the fields of community and public health, the researchers developed an educational program. The program included a background on Cannabis, the acute effects of Cannabis use, the chronic effects of Cannabis use, Cannabis dependence, withdrawal symptoms of Cannabis, somatic effects and associated health risks of Cannabis, social effects of Cannabis, and the prevention of Cannabis use. The researchers implemented the developed educational program through various teaching methods such as lectures, group discussions, demonstrations and audio-visual materials, booklets, posters, and handbooks.

## 2.4. Data collection

The researchers distributed printed hard copies of the self-administered questionnaire to stakeholders to assess their knowledge about Cannabis use (pretest). After the pretest phase was completed, the researchers began the educational program. Participants were divided into three groups because of the large number and because the researchers wanted to guarantee the effective and efficient delivery of the program. Each group received eight lectures over four days (two sessions per day). Each lecture lasted for 90 min. The program was conducted in multiple sittings; however, the researchers provided the same lectures for all groups to ensure homogeneity. The educational materials included booklets, posters, and handbooks. The researchers then disseminated the same questionnaire to assess stakeholders' knowledge about Cannabis use (posttest). The posttest was conducted eight weeks after implementing the educational program. The researchers aimed to compare the differences between pre- and post-intervention and to evaluate the effectiveness of a structured educational program on the level of stakeholders' knowledge regarding Cannabis use.

## 2.5. Data analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were calculated for categorical data using frequencies and percentages, and for continuous data using means and standard deviations. The normal distribution of the data was analyzed using the Kolmogorov–Smirnova test which showed that the data was not normally distributed. Thus, the researchers utilized the

Wilcoxon signed-rank test to compare median differences with the interquartile range of the pre- and posttests to assess the effect of the educational program on stakeholders' knowledge about Cannabis use. Furthermore, Cohen's effect size was calculated and interpreted as a minor effect (d = 0.20 or $r$ = 0.10), a medium effect (d = 0.50 or $r$ = 0.30), or a large effect (d = 0.80 or $r$ = 0.50) [25, 26]. Finally, the Kruskal–Wallis H test and the Mann–Whitney U test were performed to determine the differences between stakeholders' knowledge about Cannabis use and demographic variables. All findings were considered statistically significant at a $P$-value of ≤0.05.

# 3. Results

## 3.1. Sample description

A total of 203 participants who were enrolled in the study completed the pre- and posttests questionnaire. The majority of the participants were males 152 (74.9%), aged between 26–35 years 74 (36.5%), single 120 (59.1%), and nearly half of them had completed secondary school 100 (49.3%) (Table 1).

## 3.2. Stakeholders' awareness regarding the risk of Cannabis use at pre- and posttests

The results showed that the stakeholders' level of awareness regarding the risk of Cannabis use was higher in the posttest compared to the pretest. The highest mean scores were for items "Using Hashish is not a problem if you are over 18 years of age" followed by "The benefits of Cannabis use are less than damage and risk" and "Using Hashish makes a person socially isolated." They were also similar pre- and post-test. However, the lowest item mean scores were different at the pre- and posttests. At the pretest, "The availability of Hashish poses a significant risk to young people" had the lowest mean score, followed by "All drugs have the same harm to the user." While at the posttest, "If you try Hashish once, you will be unable to stop it" had the lowest mean score, followed by "The transient use of Hashish is dangerous" (Table 2).

Since the data deviated from the normal distribution, the researchers used the Wilcoxon signed-rank test (nonparametric tests) to compare the differences in the median (Md) scores with an interquartile range between the pre- and posttests to assess the effectiveness of the education intervention on stakeholder' awareness about the risk of Cannabis use. The Md with the interquartile range of the stakeholder's

awareness score improved from the pretest (Md = 2.85) to the posttest (Md = 4.46). The Wilcoxon signed-rank test indicated a statistically significant increase in the participants' awareness levels after implementing the educational program with a large effect size ($z = -12.299$, $P = 0.001$, $r = 0.91$). These findings indicate that the educational program effectively improved stakeholders' understanding of the risk of Cannabis use (Table 3).

TABLE 1: Demographic variables of stakeholders ($N = 203$).

| Variable | Frequency (%) |
|---|---|
| Gender | |
| Male | 152 (74.9%) |
| Female | 51 (51%) |
| Age (yr) | |
| <25 | 35 (17.2) |
| 26–35 | 74 (36.5%) |
| 36–45 | 54 (26.6%) |
| >46 | 40 (19.7%) |
| Marital status | |
| Married | 83 (40.9%) |
| Single | 120 (59.1%) |
| Educational levels | |
| Primary | 37 (18.2%) |
| Secondary | 100 (49.3%) |
| University level | 66 (32.5 %) |

## 3.3. Differences between stakeholders' awareness and demographic variables

The researchers performed the Mann–Whitney U-test and Kruskal–Wallis tests to determine differences between stakeholders' awareness of demographic variables before and after implementing the educational program. The results revealed statistically significant differences between the educational level and the stakeholder's understanding in the pre- and the posttests, where participants who graduated from university showed more awareness at the pre- and the posttests ($P =< 0.001$). However, there were no statistically significant differences between stakeholders' awareness and other demographic variables (Table 4).

TABLE 2: Stakeholders' awareness of the risk of Cannabis use at the pre- and posttests (*N* = 203).

| Items | Pretest awareness | | Posttest awareness | |
|---|---|---|---|---|
| | Mean | SD | Mean | SD |
| All drugs have the same harm to the user | 1.93 | 1.171 | 3.95 | 1.271 |
| If you try Hashish once, you will be unable to stop it | 2.66 | 1.319 | 3.90 | 1.223 |
| The transient use of Hashish is dangerous | 2.18 | 1.399 | 3.93 | 1.299 |
| Regular use of Cannabis affects all body systems | 2.42 | 1.417 | 4.49 | 0.823 |
| The availability of Hashish poses a significant risk to young people | 1.70 | 1.059 | 4.41 | 1.046 |
| Using Hashish is not a problem if you are over 18 years of age | 4.12 | 1.072 | 4.62 | 0.731 |
| Using Hashish once a month is not dangerous | 3.75 | 1.385 | 4.48 | 0.881 |
| Young people under the age of 18 should not use Hashish | 3.86 | 1.307 | 4.52 | 0.766 |
| The use of Hashish may lead to addiction | 2.90 | 1.351 | 4.51 | 0.858 |
| There is a clear link between cannabis abuse and mental problems | 2.77 | 1.548 | 4.49 | 0.846 |
| Hashish users will use more dangerous drugs than Hashish | 3.31 | 1.498 | 4.58 | 0.932 |
| The benefits of cannabis use are less than damage and risk | 3.87 | 1.276 | 4.60 | 0.740 |
| Using Hashish makes a person socially isolated | 3.87 | 1.149 | 4.48 | 0.877 |

SD, standard deviation

TABLE 3: Comparing stakeholder' awareness at the pre- and posttests (*N* = 203).

| Awareness | N | Mean ± SD | Min | Max | Percentiles | | | IQ-R | Z | P-value | r | CI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 25th | 50th (Median) | 75th | | | | | |
| Pretest | 203 | 3.03 ± 0.95 | 1.38 | 4.69 | 2.46 | 2.85 | 4.00 | 1.54 | –12.299 | 0.001 | 0.91 | 1.64–2.11 |
| Posttest | 203 | 4.40 ± 0.41 | 2.54 | 5.00 | 4.15 | 4.46 | 4.69 | 0.54 | | | | |

SD, standard deviation; Mini, minimum; Maxi, maximum; IQ-R, interquartile range; r, correlation coefficient of effect size; CI, confidence interval for Cohen's d.
Statically significant at *P*-value ≤ 0.05.

# 4. Discussion

Cannabis is one of the most frequently abused illicit drugs worldwide [27]. Recent evidence indicates that Marijuana use has several adverse effects on short- and long-term health outcomes, such as neurological problems, cognitive deterioration, respiratory symptoms, and cerebrovascular and cardiovascular disorders [10]. Therefore, this study was carried out to assess the effects of a developed educational program on stakeholders' awareness of the risks of Cannabis use. In this study, most participants were males, middle age, and single. Similarly, another study conducted to explore

TABLE 4: Differences in stakeholder' awareness with demographic variables (*N* = 203).

| Variables | N | Pretest | | | Posttest | | |
|---|---|---|---|---|---|---|---|
| | | Mean awareness 3.03 ± 0.95 Mean rank | P-value | | Mean awareness 4.38 ± 0.41 Mean rank | P-value | |
| Gender | | | | | | | |
| Male | 152 | 98.22 | 0.113 | | 98.02 | 0.095 | |
| Female | 51 | 113.27 | | | 113.85 | | |
| Age (yr) | | | | | | | |
| <25 | 35 | 84.74 | 0.172 | | 105.20 | 0.965 | |
| 26–35 | 74 | 105.31 | | | 101.34 | | |
| 36–45 | 54 | 111.85 | | | 103.63 | | |
| >46 | 40 | 97.68 | | | 98.23 | | |
| Educational level | | | | | | | |
| Primary | 37 | 19.08 | 0.001 | | 60.19 | 0.001 | |
| Secondary | 100 | 87.54 | | | 77.02 | | |
| University | 66 | 170.40 | | | 163.30 | | |
| Marital status | | | | | | | |
| Married | 83 | 97.70 | 0.385 | | 102.45 | 0.928 | |
| Single | 120 | 104.97 | | | 101.69 | | |

Statically significant at *P*-value ≤ 0.05; mean score range (1–5)

psychosocial predictors of addictive behaviors between Internet use and Cannabis use found that most participants were males aged over 20 [28]. Evidence denotes that excessive heavy Cannabis use among youth and middle-aged individuals is associated with several adverse health effects on physical and mental faculties [29]. These findings indicate that counseling programs should focus on youth and young generations.

In the present study, the stakeholder's awareness score was low at baseline before the educational program. These results agree with previous studies conducted in different countries, which reported that most participants had between poor and average knowledge scores toward Cannabis use disorder [30, 31]. In this study, similar findings were reported at baseline in terms of stakeholders' awareness; however, there was a statistically significant increase in the participants' awareness scores at the posttest with a large effect size in awareness. This remarkable change in the level of understanding about the risk of Cannabis use may be attributed to the educational program, which indicated that the program was effective. These results are consistent with a previous study conducted by Gurung *et al.* (2020) that showed that more than half of the participants had inadequate knowledge about substance use disorders at the pretest. However, in the posttest, more than one-third of participants had adequate knowledge,

and two-thirds of participants had moderate knowledge of substance use disorders. There was a significant improvement in awareness [32].

Furthermore, this study's findings were similar to a study conducted in India, which revealed a statistically significant increase in the mean knowledge score of Cannabis use disorder among participants at the posttest compared to the pretest score in the experimental group [33, 34]. On the other hand, a previous study conducted by Isralowitz *et al.* (2021) reported that most participants believed that medical Cannabis holds significant health benefits but expressed concerns regarding potential risks associated with Cannabis use [35, 36].

The researchers tested the differences between stakeholders' awareness levels with demographic variables before and after implementing the educational program. The results showed statistically significant differences between the educational level and stakeholders' understanding at the pre- and posttests. The participants who were university graduates showed a statistically significantly higher level of awareness about the risk of Cannabis than other educational levels at the pre- and posttests. However, participants who had lower levels of education exhibited substantially less understanding of the risk of Cannabis use. A possible explanation for this outcome is the lack of formal educational programs for this population to increase their awareness of the risk of Cannabis use. Besides, there is limited access to continuous training services in rural areas of the country. Thus, future consideration should focus on providing constant health education for the individual with a low level of education to raise awareness of the risks associated with Cannabis use.

## Limitations and Strengths

Even though this study denoted a significant improvement in the stakeholder's awareness score at the posttest compared to the pretest, the study has some limitations. The first limitation is the lack of a control group, the study was conducted on one group at the pretest and posttest. Therefore, future research may include a control group for the efficacy of the findings. The second limitation is using a convenience sampling method and implementing the program in a specific region due to difficulties in accessing other regions in the country. This limitation may affect the generalizability of the results and may not be representative of the entire population of Sudan. Accordingly, future research may conduct further studies in different areas of Sudan to generalize the findings.

## 5. Conclusion

The present study assessed stakeholders' awareness levels regarding the risk of Cannabis use before and after implementing an educational program. The study concluded that the educational program effectively improved stakeholders' awareness of the risk of Cannabis use. The study results may help health authorities to adopt awareness campaigns against Cannabis use among adolescents and young adults to increase awareness about the side effects of Cannabis use. This study recommends ongoing health education programs for populations with specific considerations for people with low levels of education.

## Acknowledgments

## Ethical Considerations

Before implementing the program, the researchers obtained an Institutional Review Board (IRB) approval and specific permissions to carry out this study. First, the researchers obtained an IRB approval from an educational institution (The National Ribat University Faculty of Graduate Studies and Scientific Research) in Sudan. Then, permissions were obtained from local directors to facilitate study processes and get access to eligible participants. Additionally, the researchers provided an extensive explanation to participants about the aim of the study, then, written informed consents were obtained before data collection and implementing the program. All included participants agreed to voluntarily participate in this study. All responses were kept strictly confidential for research purposes only.

## Competing Interests

The researchers declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Availability of Data and Material

The data and material of this study are available from the corresponding author upon request.

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## References

[1] Debenham, J., Newton, N., Birrell, L., Yücel, M., Lees, B., & Champion, K. (2020). Cannabis and illicit drug use during neurodevelopment and the associated structural, functional and cognitive outcomes: Protocol for a systematic review. *JMIR Research Protocols*, *9*(7), e18349.

[2] Chami, T., & Kim, C. H. (2019). Cannabis abuse and elevated risk of myocardial infarction in the young: A population-based study. *Mayo Clinic Proceedings*, *94*(8), 1647–1649.

[3] Chen, Y., & Le-Short, C. (2021). Cannabis withdrawal. *Cannabinoids Pain*.;317–22.

[4] Memedovich, K. A., Dowsett, L. E., Spackman, E., Noseworthy, T., & Clement, F. (2018). The adverse health effects and harms related to marijuana use: An overview review. *CMAJ Open*, *6*(3), E339–E346.

[5] Connor, J. P., Stjepanović, D., Le Foll, B., Hoch, E., Budney, A. J., & Hall, W. D. (2021). Cannabis use and cannabis use disorder. *Nature Reviews Disease Primers*, *7*(1), 1–24.

[6] Hassanain Elsayed, Y. M. (2020). The dramatic reversal of hashish-induced junctional tachycardia and unstable angina with standard therapy in heavy smoker patient. *International Journal of Research Studies in Medical and Health Sciences*, *5*(3), 16–19.

[7] Mohamed, S., Modawe, G. A., Gurashi, R. A., Mohamed, S. B., & Abdrabo, A. A. (2015). Assessment of plasma alanine aminotransferase, aspartate aminotransferase and alkaline phosphatase activity among Sudanese Cannabis abuse people. *Pyrex Journal of Biomedical Research*, *1*(5), 55–58.

[8] Maayah, Z. H., Takahara, S., Ferdaoussi, M., & Dyck, J. R. B. (2020). The anti-inflammatory and analgesic effects of formulated full-spectrum cannabis extract in

the treatment of neuropathic pain associated with multiple sclerosis. *Inflammation Research*, *69*(6), 549–558.

[9] McLaren-Blades, A., Ladha, K., Goel, A., Manoo, V., Kotteeswaran, Y., Gee, Y. Y., Fiorellino, J., & Clarke, H. (2020). Perioperative pain and addiction interdisciplinary network (PAIN): Protocol for the perioperative management of cannabis and cannabinoid-based medicines using a modified Delphi process. *BMJ Open*, *10*(7), e036472.

[10] Parekh, T., & Fahim, F. (2021). Building risk prediction models for daily use of marijuana using machine learning techniques. *Drug and Alcohol Dependence*, *225*, 108789.

[11] Gunderson, L. M., Sebastian, R. R., Willging, C. E., & Ramos, M. M. (2020). Ambivalence in how to address adolescent marijuana use: Implications for counseling. *Children and Youth Services Review*, *118*, 105367.

[12] Simpson, K. A., Cho, J., & Barrington-Trimis, J. L. (2021). The association of type of cannabis product used and frequency of use with problematic cannabis use in a sample of young adult cannabis users. *Drug and Alcohol Dependence*, *226*, 108865.

[13] WHO. (2016). The health and social effects of nonmedical cannabis use [Internet]. Geneva, Switzerland: WHO. www.who.int

[14] Schauer, G. L., Clayton, H. B., Njai, R., & Grant, A. M. (2020). Adolescent marijuana use and related risk behaviors, national findings from 2015 to 2017. *American Journal of Preventive Medicine*, *59*(5), 714–724.

[15] Raitasalo, K., Karjalainen, K., Ollila, H., Ruokolainen, O., & Hakkarainen, P. (2021). Smoke in the air – Associations between experimentation with cannabis and the use of tobacco and nicotine products among 15–16-year-old school students. *Addictive Behaviors*, *114*, 106714.

[16] Osman, T., Victor, C., Abdulmoneim, A., Mohammed, H., Abdalla, F., Ahmed, A., Ali, E., & Mohammed, W. (2016). Epidemiology of substance use among university students in Sudan. *Journal of Addiction*, 2016, 2476164.

[17] Lipari, R., & Jean-Francois, B. (2016). Trends in perception of risk and avail-ability of substance use among full-time college students. *CBHSQ Report*. https://www.ncbi.nlm.nih.gov/books/NBK396151/

[18] Leos-Toro, C., Fong, G. T., Meyer, S. B., & Hammond, D. (2020). Cannabis health knowledge and risk perceptions among Canadian youth and young adults. *Harm Reduction Journal*, *17*, 54.

[19] Frank, V. A., Bjerge, B., Duke, K., Klein, A., & Stothard, B. (2015). Stakeholder influences on drug and alcohol policy processes. *Drugs and Alcohol Today*, *15*(4).

[20] Saad, A., Zahid, S. M., & Muhammad U Bin. (2020). Role of awareness in strengthening the relationship between stakeholder management and project success in the construction industry of Pakistan. *International Journal of Construction Management*, *22*, 1884–1893.

[21] Warren, A. M., Constantinides, S. V., Blake, C. E., & Frongillo, E. A. (2021). Advancing knowledge about stakeholder engagement in multisectoral nutrition research. *Global Food Security*, *29*, 100521.

[22] Kordi, N. E., Belayutham, S., & Che Ibrahim, C. K. I. (2021). Mapping of social sustainability attributes to stakeholders' involvement in construction project life cycle. *Construction Management and Economics*, *39*(6), 513–532.

[23] Lübbeke A., Carr A. J., & Hoffmeyer, P. (2019). Registry stakeholders. *EFORT Open Reviews*, *4*(6), 330–336.

[24] Soma, K., Dijkshoorn-Dekker, M. W. C., & Polman, N. B. P. (2018). Stakeholder contributions through transitions towards urban sustainability. *Sustainable Cities and Society*, *37*, 438–450.

[25] Lovakov, A., & Agadullina, E. R. (2021). Empirically derived guidelines for effect size interpretation in social psychology. *European Journal of Social Psychology*, 00, 1–20.

[26] Furukawa, T. A., & Leucht, S. (2011). How to obtain NNT from Cohen's D: Comparison of two methods. *PLoS One*, *6*(4).

[27] Goycolea, R., Castro-Alonso, J. C., & Dörr, A. (2020). Visuospatial processing decline due to cannabis consumption in nondependent high school students. *Educational Psychology Review*, *33*(2), 619–635.

[28] Akbari, M., Bahadori, M. H., Mohammadkhani, S., Kolubinski, D. C., Nikčević, A. V., & Spada, M. M. (2021). A discriminant analysis model of psychosocial predictors of problematic Internet use and cannabis use disorder in university students. *Addictive Behaviors Reports*, *14*, 100354.

[29] Olthof, M. I. A., Blankers, M., van Laar, M. W., & Goudriaan, A. E. (2021). ICan, an Internet-based intervention to reduce cannabis use: Study protocol for a randomized controlled trial. *Trials*, *22*(1), 1–12.

[30] Alves, R., Precioso, J., & Becoña, E. (2020). Ilicit drug use among college students: The importance of knowledge about drugs, live at home and peer influence. *Journal of Psychoactive Drugs*, *53*(4), 329–338.

[31] Mitra, T., Sharma, P. A., Das, R., & Gopal, S. (2020). A study to assess the level of knowledge of cannabis use disorder among adolescents. *Indian Journal of Psychiatric Nursing*, *17*(2), 79.

[32] Gurung, D., Thapa, B., & Paudel, A. (2020). Prevalence of substance use disorders and effectiveness of educational package on knowledge regarding the disorders among adolescents in selected schools of Lekhnath, Nepal. *International Journal of Innovative Science and Research Technology*, *5*(7), 934–941.

[33] Tanushree, M., Punita, B., Sharma, A., & Mitra, T. (2020). A study to assess the effectiveness of psycho-educative module on knowledge of cannabis use disorder among adolescents. *International Journal of Psychiatric Nursing*, *6*( Jul–Dec), 44.

[34] Banerjee, S. (2021). Effectiveness of planned teaching programme on knowledge regarding prevention of substance abuse among students of class IX of Green Park Sikshasadan High School, Kolkata, West Bengal, India. *International Journal of Recent Advances in Multidisciplinary Research*, *2*(8), 8–12.

[35] Isralowitz, R., Reznik, A., Zolotov, Y., Grinstein-Cohen, O., Wacht, O., Pruginin, I., Pruginin, I., Yehudai, M., & Edelstein, O. (2021). Toward medical cannabis education in Israel. *Complementary Therapies in Medicine*, *58*, 102709.

[36] Zolotov, Y., Grinstein Cohen, O., Findley, P. A., Reznik, A., Isralowitz, R., & Willard, S. (2021). Attitudes and knowledge about medical cannabis among Israeli and American nursing students. *Nurse Education Today*, *99*, 104789.