Prevalence of Drug Abuse and Related Factors amongst Undergraduate University Students

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ABSTRACT.

Background: Drug abuse is already a grave issue in Nigeria, particularly with regard to the country's higher educational institutions, necessitating immediate action. **Objectives**: We aim to determine the prevalence of drug abuse and related factors amongst Nnamdi Azikiwe University students in Nnewi campus, Anambra state, Nigeria. **Materials and Methods**: This is a cross-sectional descriptive study involving one hundred participants recruited using simple random sampling method. SKYTECTM Drug abuse test kit was used to detect the presence of tramadol, tetrahydrocannabinol (THC), methamphetamine (MET), ketamine (KET) and 3, 4-methylenedioxymethamphetamine (MDMA) in the subjects' urine sample following the manufacturer's instruction. The Statistical Package for Social Science (SPSS) version 26 software batch system was used for the statistical analysis. Frequency, percentage, and chi square statistics were used to analyze the data and the level of significance was set at $p<0.05$. **Results**: The findings revealed that 7% (<18.5 kg/m^2) of the participants were underweight, 69% (18.5-24.9 kg/m^2) were normal weight, 15% (25 kg/m^2) were overweight, and 9% (>30.0 kg/m^2) were obese. The prevalence of drugs abused by the participants were THC 7(7%), tramadol 0(0%), MET 0(0%), KET 0(0%), and MDMA 0(0%) respectively. Curiosity; stress relief, peer pressure and choice were the influencing factors. There was a significant association between the place of abuse with the current trend of drug abuse ($\chi^2 = 17.872$, p=0.003) and between abuse partner with the current trend of drug abuse ($\chi^2 = 15.184$, p=0.002).

Conclusion: Early intervention focused at preventative and therapeutic measures should be implemented.

Keywords: Drugs, Drug abuse, Tetrahydrocannabinol, Body mass index

INTRODUCTION

According to the United Nations Office on Drugs and Crime (UNODC), 2022, drug abuse is a global problem that affects 284 million people between the ages of 15 and 64 [1]. Most Africans undergoing treatment for drug use problems are under the age of 35 [1].

Drugs are chemicals that, if ingested into the body through eating, drinking, inhaling, intravenous use, and other methods, can alter psychological states such as feelings, thoughts, moods, and behavior [2]. The harmful or risky use of psychoactive substances, such as alcohol and illegal narcotics, is referred to as drug abuse, also known as substance abuse [3]. One of the main health problems impacting young people, particularly in Nigeria, is the abuse of drugs. This has become a severe public health concern because young people are expected to be the engine of change and progress for the nation's economy.

Adolescence is the most prevalent age when people start using or abusing drugs or other substances and young people between the ages of 18 and 25 mostly fall within this category [4-6]. Drug experimentation by young people is widespread in Nigeria. At this stage, most young people feel the need to explore a lot for a variety of reasons, including: curiosity, peer pressure, and stress relief [3]. Young people engagement in the use of drugs has numerous consequences. It can result in a variety of physical and mental health issues, including brain damage, impaired cognitive abilities, and even memory loss [7]. It increases the likelihood of mishaps, injuries, and unsafe sexual conduct, all of which have serious health repercussions. It can also exacerbate existing mental health issues or perhaps cause the development of new ones [7].

Drug abuse is becoming an increasing problem in Nigeria. The impact of drug abuse on society has become a topical issue and a major public health concern [8]. In addition, drug abuse can have a significant negative impact on academic achievement. Numerous studies have shown that, as compared to their peers who do not use substances, individuals who abuse drugs or alcohol typically have worse grades, higher absenteeism rates, and are more likely to drop out of school [9-11]. The prevalence of drug abuse was reported to be 10.1%, with tramadol being the most commonly abused drug in North-Western Nigeria [12]. There were also significant correlations between drug abuse and respondents' occupation, family type, and monthly income [12]. A review study in Nigeria found that the prevalence of drug abuse among students and youths was 20-40% and 20.9%, respectively, with the most often abused drugs being cannabis, cocaine, amphetamine, heroin, diazepam, codeine, cough syrup, and tramadol [13].

Research on the prevalence of drug abuse in the southeast of Nigeria, particularly in Nnewi, Anambra State, is scarce. In this study, Nnamdi Azikiwe University students in Nnewi campus were examined for their drug abuse patterns and risk factors.

Data obtained from this study will offer valuable insights to develop targeted treatments, enhance student well-being, and create a safer and more supportive academic environment.

MATERIALS AND METHODS

Materials
SKY TEC™ drug abuse test kit (made in China) for the determination of the presence of tramadol, THC, methamphetamine, ketamine and 3, 4-methylenedioxymethamphetamine.

Study Site
The study was carried out in College of Health Sciences and Technology, Nnamdi Azikiwe University Nnewi Campus, Anambra state, Nigeria. Subjects were recruited from the school and the lodges within its environment.

Study Design
This cross-sectional descriptive study examined the prevalence of tramadol (TRA),

Tetrahydrocannabinol (THC), methamphetamine (MET), ketamine (KET), and 3, 4-methylenedioxymethamphetamine (MDMA) abuse amongst students at Nnamdi Azikiwe University in Nnewi campus. One hundred (100) participants were selected from the school environment using simple random sampling (Random number tables), and a structured questionnaire was used to obtain sociodemographic data from the subjects. The participants were requested to provide responses to the key components of the questionnaire and consumption of greater than 2 bottles of alcoholic drinks per day was considered an abuse in this study: Also, the body mass index (BMI) was calculated using the following formula:

$$BMI = \frac{weight\ (kg)}{Height^2\ (m^2)}$$

A measuring tape was fastened to a piece of wood to determine height, and an electronic weighing scale (Peace Sky model PH-2015A made in China) was used to determine weight. BMI of 25 and 30 kg/m^2 was used to classify overweight and generalized obesity, respectively.

Study population
The Undergraduate students attending College of Health sciences of Nnamdi Azikiwe University, Nnewi Campus made up the study population.

Sample size calculation
The G-power program version 3.0.10 was used to compute the sample size, using an alpha of 0.05, a power of 0.95, and a medium effective size of 0.5. With 95% accuracy, the predicted sample size of 80 can identify differences of 0.5 at a 0.05 level of significance. However, a total sample size of one hundred (100) people was used for this study.

Inclusion criteria
The present study included male and female Nnamdi Azikiwe University, Nnewi campus students between the ages of 17 and 35 who were residing within the school setting.

Exclusion criteria
Students outside the stipulated age limit and those not living within the school and its environment were excluded from this study.

Ethical approval
In accordance with the Helsinki declaration by the World Medical Association (WMA) on the ethical principles for medical research involving human subjects [14]; the Nnamdi Azikiwe University Teaching Hospital ethics committee granted its approval for this study (NAUTH/CS/66/VOL.16/VER.3/298/2023/237).

Informed consent
Prior to the study, written informed consent from the subjects was sought and obtained.

Sample collection
The participants were given a clean, dry container to dispense about five milliliters (5ml) of midstream urine. The urine samples were refrigerated at 2-8°C prior to use. The refrigerated specimens were allowed to equilibrate to room temperature before testing. The urine samples exhibiting precipitates were allowed to settle so that clear aliquots could be obtained for testing.

Determination of the presence of tramadol, tetrahydrocannabinol, methamphetamine, ketamine and 3, 4-methylenedioxymethamphetamine.
Determination of the presence of these drugs in the samples was carried out by in-vitro immunographic urinary assay using the 10-panel urine drug test kits according to the SKYTEC^{TM} protocol.

Test kit preparation
The drug test cassette typically consists of a panel that has been treated with chemicals that react to specific drugs. Before starting the test, the test kit was prepared according to the manufacturer's instructions.

Test Procedure
Test device, patient sample and control were brought to room temperature (20-25ºC) prior to testing. The test device was then removed from its protective pouch and labeled with patient's ID number after which it was immersed into the sample with the arrow end pointing towards the sample. The cassette was taken out after 10 seconds and laid flat on a

clean, dry non-absorbent surface. The test result was read after five (5) minutes.

Interpretation of results

Results from a 10- panel drug test are usually reported as positive, negative or invalid:

Negative: Two pink-colored bands appear, one in the control region and one in the test region. A negative result indicates free drug is absent from the urine.

Positive: One pink-colored band appears in the control region with no apparent band appearing in the test region. A positive result indicates free drug is present in the urine.

Invalid: No band appears in the control region, or a pink-colored band appears in the test region only.

Cut off Level

THC: 50ng/ml; TRA: 100ng/ml, MET: 1000ng/ml, KET: 1000ng/ml and MDMA: 500ng/ml

Statistical analysis

The Statistical Package for Social Science (SPSS) version 26 software batch system was used for the statistical analysis. Frequency, percentage, and chi-square statistics were used to analyze the data. The level of significance was set at $p<0.05$.

RESULTS

A total of one hundred (100) participants took part in the study; of which 57% of the participants were males, and 43% were females.

Eighty-one (81%) were between the ages of 22 and 35 years, 15 (15%), between the ages of 18 and 21 years, and 4 (4%), between the ages of 17 and 18 years. Sixty-nine (69%) had a BMI of 18.5-24.9 kg/m^2, 15 (15%) had a BMI of 25-29.9 kg/m^2, 9 (9%), had a BMI above $30kg/m^2$, and 7 (7%) had a BMI < 18.5 kg/m^2. Twenty percent (20%) were in the Department of Medical Laboratory Science, 24 (24%) in the

Department of Medical Rehabilitation, 29 (29%) in the Department of Nursing Science, 17 (17%) in the Department of Radiography, and 10 (10%) in the Department of Environmental Health Science.

There were 97 Christians (ninety-seven), 2 Muslims (two percent), and 1 person from other religions. While 97 of the participants (97%) were single, only three (3%) were married. In the total population studied, 7(7%) had abused at least one type of the drugs studied. Of the seven percent of individuals who had abused at least one type of the drugs studied, six were males (85.7%) and the remaining one participant was a female (14.3%). Furthermore, six participants (85.7%) were between the ages of 22 and 35, while one (1) individual (14.3%) was between the ages of 18 and 21.

Out of the seven persons who had abused at least one type of drugs studied, five (71.4%) individuals had a BMI between 18.5-24.9 kg/m^2, one (14.3%) had a BMI greater than 30 kg/m^2, and one (14.3%) individual had a BMI less than 18.5 kg/m^2 and of these individuals, three (42.9%) students were enrolled in the nursing science program, two (28.5%) in the medical rehabilitation program, one (14.3%) in radiography, and one (14.3%) in environmental science (14.3%). All were single and of the Christian faith.

The current trend of drug abuse was significantly correlated with the location of the abuse (χ^2 = 17.872, p=0.003). The current trend of drug abuse was significantly associated with the abuse partner (X2 = 15.184, p=0.002). See table 1.

The prevalence of drug abuse was: THC 7(7%), TRA 0(0%), MET 0(0%), KET 0(0%), MDMA 0 (0%) respectively. The result showed that THC 7(7%) was the most abused drug by students of the College of Health Sciences, Nnamdi Azikiwe University, Nnewi campus (Table 2).

Table 1: Socio-demographic distribution and anthropometric measurements of the study population.

Variables	Positive (%)	Negative (%)	Total (%)	χ^2	p-value
Sex					
Male	6(85.6%)	51(54.8%)	57(57.0%)		
Female	1(14.3%)	42(45.2%)	43(43.0%)	2.532	0.112
Total	7(100%)	93(100%)	100(100%)		
BMI					
<18.5 kg/m^2	1(14.3%)	6(6.5%)	7(7.0%)		
18.5 – 24.9 kg/m^2	5(71.4%)	64(68.8%)	69(69.0%)	1.940	0.585
25- 29.9 kg/m^2	0(0.0%)	15(16.1%)	15(15.0%)		
30 kg/m^2 and above	1(14.3%)	8(8.6%)	9(9.0%)		
Total	7(100%)	93(100%)	100(100%)		
Age range					
<17 years	0(0.0%)	4(4.3%)	4(4.0%)		
18-21 years	1(14.3%)	14(15.1%)	15(15.0%)	0.324	0.850
22-35 years	6(85.7%)	75(80.6%)	81(81.0%)		
Total	9(100%)	93(100.0%)	100(100.0%)		
Department					
Medical Laboratory Science	0(0.0%)	20(21.5%)	20(20.0%)		
Medical Rehabilitation	2(28.6%)	22(23.7%)	24(24.0%)	2.240	0.692
Nursing Sciences	3(42.9%)	26(28.0%)	29(29.0%)		
Radiography	1(14.3%)	16(17.2%)	17(17.0%)		
Environmental Health science	1(14.3%)	9(9.7%)	10(10.0%)		
Total	7(100.0%)	93(100%)	100(100.0%)		
Religion					
Christianity	7(100%)	90(96.8%)	97(97%)		
Islam	0(0.0%)	2(2.2%)	2(2.0%)	0.233	0.890
Others	0(0.0%)	1(1.1%)	1(1.0%)		
Total	7(100%)	93(100%)	100(100%)		

Table 2: Drug abuse and related variables among the study Population

Variables	Positive (%)	Negative (%)	Total (%)	χ^2	p-value
Living Partner(s)					
Father	1(14.3%)	4(4.3%)	5(5.0%)		
Mother	1(14.3%)	15(16.1%)	16(16.0%)		
Both parents	4(57.1%)	70(75.3%)	74(74.0%)		
Sister	1(14.3%)	1(1.1%)	2(2.0%)		
Spouse	0(0.0%)	2(2.2%)	2(2.0%)	7.507	0.186
Nobody	0(0.0%)	1(1.1%)	1(1.0%)		
Total	7(100%)	93(100%)	100(100%)		
History of drug abuse					
Yes	3(42.9%)	17(18.3%)	20(20.0%)		
No	4(57.1%)	76(81.7%)	80(80.0%)	2.458	0.117
Total	7(100%)	93(100%)	100(100%)		
Type of drug abused					
Marijuana	1(14.3%)	6(6.5%)	7(7.0%)	28.387	0.000
Crystal meth	1(14.3%)	0(0.0%)	1(1.0%)		
Alcohol	0(0.0%)	8(8.6%)	8(8.0%)		
Tramadol	1(14.3%)	0(0.0%)	1(1.0%)		
Inhalant (Ventolin)	0(0.0%)	1(1.1%)	1(1.0%)		
None	4(57.1%)	78(83.9%)	82(82.0%)		
Total	7(100%)	93(100%)	100(100%)		

Age of Commencement				8.038	0.090
<12 years	0(0.0%)	1(1.1%)	1(1.0%)		
13-17 years	0(0.0%)	4(4.3%)	4(4.0%)		
18-22 years	0(0.0%)	2(2.2%)	2(2.0%)		
>22 years	3(42.9%)	8(8.6%)	11(11.0%)		
None	4(57.1%)	78(83.9%)	82(82.0%)		
Total	7(100.0%)	93(100%)	100(100%)		
Place of Abuse					
School	1(14.3%)	7(7.5%)	8(8.0%)	17.872	0.003
Friends home	2(28.6%)	1(1.1%)	3(3.0%)		
Home	0(0.0%)	4(4.3%)	4(4.0%)		
Shop	0(0.0%)	1(1.1%)	1(1.0%)		
Bar/pub	0(0.0%)	2(2.2%)	2(2.0%)		
None	4(57.1%)	78(83.9%)	82(82.0%)		
Total	7(100%)	93(100%)	100(100%)		
Abuse partner(s)					
Friends	2(28.6%)	12(12.9%)	14(14.0%)	15.184	0.002
Brother	1(14.3%)	0(0.0%)	1(1.0%)		
Alone	0(0.0%)	2(2.2%)	2(2.0%)		
None	4(57.1%)	79(84.9%)	83(83.0%)		
Total	7(100%)	93(100%)	100(100%)		
Reasons					
Relieve stress	1(14.3%)	3(3.2%)	4(4.0%)	4.858	0.302
Curiosity	1(14.3%)	8(8.6%)	9(9.0%)		
Peer pressure	1(14.3%)	3(3.2%)	4(4.0%)		
Choice	0(0.0%)	1(1.1%)	1(1.0%)		
None	4(57.1%)	78(83.9%)	82(82.0%)		
Total	7(100%)	93(100%)	100(100%)		
House Discipline				0.328	0.955
Very loose	0(0.0%)	1(1.1%)	1(1.0%)		
Loose	1(14.3%)	8(8.6%)	9(9.0%)		
Strict	4(57.1%)	55(59.1%)	59(59.0%)		
Very strictly	2(28.6%)	29(31.2%)	31(31.0%)		
Total	7(100%)	93(100%)	100(100%)	1.614	0.204
Influences of abuse					
Friends	2(28.6%)	11(11.8%)	13(13.0%)		
None	5(71.4%)	82(88.2%)	87(87.0%)		
Total	7(100%)	93(100%)	100(100.0%)		

Table 3: Frequency distribution of drug abuse in the studied population (n=100)

Drug Abused	Frequency (%)		Total Frequency (%)
	Positive (%)	Negative (%)	
TRA	0(0%)	100(100%)	100(100%)
THC	7(7%)	93(93%)	100(100%)
MET	0(0%)	100(100%)	100(100%)
KET	0(0%)	100(100%)	100(100%)
MDMA	0(0%)	100(100%)	100(100%)

Key: *TRA= Tramadol; THC= Tetrahydrocannabinol; MET= Methamphetamine; KET= Ketamine; MDMA= 3,4-Methylenedioxymethamphetamine.*

DISCUSSION

In Nigeria, drug abuse has taken on a concerning dimension and is having devastating impacts on society [13]. Some of the devastating impact can lead to numerous acute and chronic health problems including lung cancer, colon cancer), social disorders as well as psychological problems [15]. This study was done to determine the prevalence of abuse of tramadol, tetrahydrocannabinol, methamphetamine, ketamine and 3, 4-Methylenedioxymethamphetamine amongst Nnamdi Azikiwe University undergraduate students in Nnewi Campus.

In this study, the gender distribution was fairly evenly split between the male and female participants. This shows that, unlike in the past when it was largely designated for the young male adults, both male and female persons today stand practically an equal chance of entering higher institutions in the southeast of Nigeria.

Based on the World Health Organization (WHO) Classification of body mass index [16], the body mass index of the participants in this study revealed that 7% of them were underweight ($18.5 kg/m^2$), 69% were of normal weight ($18.5-24.9 kg/m^2$), 15% were overweight ($25-29.9 kg/m^2$), and 9% were obese. Analike *et al*. [17] found that the majority of their study participants (64%) had a normal BMI, and that 27% of the participants were overweight and 6% were pre-obese, with 44% of the participants being males and 56% being females, with an average age of 22.41 ± 1.68 years which is in keeping with the current findings. An energy imbalance between calories consumed and calories burned is the primary cause of obesity and overweight. This could be brought on by an increase in the consumption of calorie-dense foods high in fat and sugar, as well as a rise in physical inactivity caused by the increasing sedentary nature of many occupations, shifting modes of transportation, and escalating urbanization [18]. Increased BMI is a significant risk factor for noncommunicable diseases such cancer, diabetes, cardiovascular disease, and musculoskeletal disorders [18].

The majority of the responders were young adults between the ages of 22 and 35 years. Contrary to the respondents' mean age of 19.5 ± 2.0 years found

among undergraduate students by Durowade *et al*. [19] in their study on Substance Use: Prevalence, Pattern and Risk Factors among Undergraduate Students in a Tertiary Institution in Southwest Nigeria, the participants in this study were older on average. In another study, a higher percentage of respondents were male students, and the majority of respondents were young adults between the ages of 20 and 25 [20]. The majority of undergraduates are energetic, impressionable young people who are still experimenting, which predispose them to social vices like drug abuse.

Notably, the majority of participants (74%) said they lived with both sets of parents, while only 16% said they lived with just their mothers. This might be a sign that they are not being closely watched, which creates an environment where drug abuse can flourish covertly.

In this study, Christians made up the majority of the respondents, followed by Muslims and other religions. This may be a result of the study's geographic setting, as Christian communities and families predominate in the southeast of Nigeria. The lower prevalence of drug usage seen in the current study may possibly have been influenced by this. This is so because most people prefer to take seriously the teachings of their religion and the things they hold dear.

The results of this study revealed that 20% of college students had abused drugs at some point in their lives. This is partly in accordance with the United Nations Office on Drugs and Crime (UNODC) data from 2018, which found that one in seven people, mostly men between the ages of 15 and 64, had used a psychoactive substance [6]. Additionally, the present prevalence of drug abuse history is lower than the prevalence of psychoactive substance use (49%) reported by Gebresilassie *et al*. [21] in their study on Prevalence of, Factors Associated with, and Level of Dependence of Psychoactive Substance Use among Mekelle University Students, Ethiopia. The variations in the rates of drug abuse reported across studies may result from variations in the availability of these drugs, susceptibility to peer pressure, and variations in people's capacities to cope with various stressors, leading them to turn to drug use or abuse as a coping mechanism. It is

possible that the current finding was also impacted by the variations in sample sizes employed in the various investigations.

The age group of 22 to 35 years (85.7%), nursing science students (42.9%), and single people (100%) had the highest rate of substance abuse. This result could be explained by the higher propensities or curiosities of people in this age group to experiment with substances. Similar study by Olanrewaju *et al*. [22] found that drug and substance abuse prevalence was 45.7% and that one in four students abused drugs despite an overall risk awareness level of 94.6%. Students that abuse drugs do so for a variety of reasons. According to this study, the majority of drug users do so out of curiosity. They also use drugs for stress relief, out of free will, and as a result of peer pressure. According to Idris and Sambo [23], experimenting and curiosity are some of the main causes of substance consumption among college students in Zaria, Kaduna State. This is in keeping with the current results. Additionally, Lawal and Aliyu [12] found that the two main factors contributing to respondents' drug abuse were peer pressure (19.5%) and a desire for enjoyment (13.3%). However, the results of this present study contradict those of Idowu *et al*. [24], who observed that drug use among students is mostly driven by a desire to improve memory or intellectual capacity.

The type of drug consumed and the present pattern of drug abuse were significantly associated. This is a sign that anti-drug abuse programs have been slightly neglected. Relevantly, there is a pressing need to raise awareness of the health risks and the importance of avoiding drug use, therefore aggressive efforts must be reenergized while looking into new tactics to fight this plaque. There was a strong association found between the abuse location and the current drug abuse trend.

According to this present study, 28.6% of drug users admitted to abusing drugs at friends' houses. Many of them choose to take drugs in the homes of their friends because it is simpler to do so in a setting where drug abuse is normalized or tolerated. Exactly 14.3% of students reported abusing drugs in a school setting. This can be owing to inadequate support structures (a system that is capable of checkmating the abuse of drugs among students) and a lack of suitable education on the impact of drug abuse.

Additionally, there was a strong correlation between the present drug abuse trend and the abuse partner. This shows that drug abuse is influenced by peer groups. This study has shown that 28.6% of people who abuse drugs have friends who also engage in similar behavior. One common saying goes, "Show me your friends, and I will tell you who you are." As a result, being around friends who consume drugs increases the risk of abusing drugs. The present findings showed that tetrahydrocannabinol, the primary chemical in cannabis (marijuana), were the substance that students at Nnamdi Azikiwe University's Nnewi campus abused the most frequently, and followed by tramadol, methamphetamine, ketamine, and 3, 4-Methylenedioxymethamphetamine (ecstasy). This is consistent with a number of studies that indicated cannabis was the most commonly used illicit substance in Nigeria [6, 25]. Nevertheless, drug use patterns may vary from place to place. Religion, sociocultural beliefs, and literacy, among other things, may all have an impact on drug use habits. Adolescent drug usage is influenced by a complicated interaction between a variety of factors, according to Nawi *et al*. [26].

Male undergraduates (85.7%) have a higher rate of substance abuse than female undergraduates (14.3%). This is in contrast to the 2017 analysis by Johnson *et al* [27], which found that substance abuse was more common among females than males.

The limited sample size that was used in this analysis may have influenced the current findings, among other noteworthy limitations of this study. Additionally, some students declined to give their informed consent for the study, which prevented us from taking their blood samples.

CONCLUSION

This study revealed a high prevalence of drug abuse among the population studied. Consequently, early intervention focused at preventative and therapeutic measures should be implemented. It is important to start aggressive and intensified education campaigns about the risks of drug abuse. Additionally, it is important to build up active mechanisms for identifying drug users so that they can receive rehabilitation early. In order to prevent relapse, adequate follow-up measures should be implemented. More research should be conducted to

assess the prevalence of drug and substance abuse in the nation, with a focus on the biological, psychological, and social causes of substance abuse, in order to produce data which will inform public health interventions and policy making.

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Data availability: The data used to support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest: The authors declare no conflict of interest in the conduct and publication of this work.

Ethical approval: The study was approved by the Institutional Ethics Committee.

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