SMAD, Rev Eletrônica Saúde Mental Álcool Drog.
2022 Apr.-June;18(2):38-49
DOI: 10.11606/issn.1806-6976.smad.2022.178476
www.revistas.usp.br/smad/

Original Article

Attention assessment in cocaine users in Psychosocial Support Center

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Objective: to evaluate attentional impairment in cocaine users when compared to a control group, as well as identify and describe sociodemographic data, cocaine abuse and/or dependence in a sample of university students and patients of a Psychosocial Support Center. **Method**: A descriptive study with a quantitative approach. A total of 25 people participated in the research, 15 from the control group and ten from the experimental group. Instruments were used to measure attention (Psychological Battery for Attention Assessment) and the instrument to measure what types of substances had already been used by the subjects (Alcohol, Smoking and Substance Involvement Screening Test), outlining the research to be more objective. **Results**: attentional impairment caused by cocaine use was perceived in the user population compared to the control group. **Conclusion**: this study allows the possibility to reflect on the damage caused by the use of cocaine and opens new perspectives for the discovery of other harms of the use of the same drug.

Descriptors: Students; Illicit Drugs; Cocaine; Attention; Patients.

How to cite this article
Cariste LM, Ferro LRM, Oliveira AJ, Justino MR, Budel ER, Rezende MM. Attention assessment in cocaine users in Psychosocial Support Center. SMAD, Rev Eletrônica Saúde Mental Álcool Drog. 2022 Apr.-June;18(2):38-49. https://doi.org/10.11606/issn.1806-6976.smad.2022.178476

Avaliação da atenção em usuários de cocaína em Centro de Apoio Psicossocial

Objetivo: avaliar os danos atencionais em usuários de cocaína quando comparados a um grupo-controle, assim como identificar e descrever os dados sociodemográficos, o consumo abusivo e/ou a dependência de cocaína em uma amostra de universitários e de pacientes de um Centro de Apoio Psicossocial. **Método**: estudo descritivo com abordagem quantitativa. No total, 25 pessoas participaram da pesquisa, sendo 15 do grupo-controle e dez do grupo experimental. Foram utilizados instrumentos para medir a atenção (Bateria Psicológica para Avaliação da Atenção) e o instrumento para mensurar quais tipos de substâncias já foram utilizadas pelos sujeitos (*Alcohol, Smoking and Substance Involvement Screening Test*), delineando a pesquisa para que seja mais objetiva. **Resultados**: foram percebidos prejuízos atencionais causados pelo uso da cocaína na população de usuários em comparação com o grupo-controle. **Conclusão**: este estudo permite a possibilidade de refletir sobre esses danos causados pelo uso da cocaína e abrem-se novas perspectivas para a descoberta para outros prejuízos do uso da mesma droga.

Descritores: Estudantes; Drogas Ilícitas; Cocaína; Atenção; Pacientes.

Evaluación de la atención en consumidores de cocaína en un Centro de Apoyo Psicosocial

Objetivo: evaluar el daño atencional en consumidores de cocaína en comparación con un grupo control, así como identificar y describir los datos sociodemográficos, el consumo abusivo y/o dependencia de cocaína en una muestra de estudiantes universitarios y pacientes de un Centro de Apoyo Psicosocial. **Método**: consiste en un estudio descriptivo con enfoque cuantitativo. En total, 25 personas participaron en la investigación, 15 del grupo control y 10 del grupo de usuarios. Se utilizaron instrumentos para medir la atención (Bateria Psicológica para Avaliação da Atenção) y qué tipos de sustancias ya han sido utilizadas por los sujetos (*Alcohol, Smoking and Substance Involvement Screening Test*), perfilando la investigación para que sea más objetiva. **Resultados**: el daño atencional causado por el uso de cocaína se percibió en la población usuária, em comparación com el grupo contról. **Conclusión**: este estudio permite la posibilidad de reflexionar sobre estos daños provocados por el uso de cocaína y abre nuevas perspectivas para el descubrimiento de otros daños del uso de la misma droga.

Descriptores: Estudiantes; Drogas Ilícitas; Cocaína; Atención; Pacientes.

Introduction

The abuse of cocaine can cause various health problems to the individual, both physiological and social and psychological. According to the Statistical and Diagnostic Manual of Mental Disorders (DSM-5), among the mental and behavioral disorders due to the use of cocaine are Dependence, Abuse, Intoxication, Abstinence, Delirium, Psychotic Disorders, Mood Disorders, Anxiety Disorders, Sleep Disorders, and Sexual Dysfunctions[1].

The problem concerning the use of cocaine in Brazil is worrying. It is estimated that 13.3 million people have consumed cocaine in the decade of the 2000s[2] and, in the country, according to the 1st Household Survey on Drug Use, conducted by the Brazilian Center for Information on Psychotropic Drugs[3], it was found that 7.2% of males between 25 and 34 years old had already used the drug.

Furthermore, the data on cocaine users increases among students not only in the capital cities of São Paulo and Rio de Janeiro, but in the other ten capital cities covered by the study[4]. In another survey conducted in 1997, it was noted that the use of cocaine appeared in ninth place in the preference for use by students[5]. In the following survey, in 2004, it appears in fifth place[4]. There has also been an increase in the number of cocaine users/dependents among patients seeking care in specialized clinics[6].

Drug use is a growing public health problem. The National Survey (LENAD - 2012) points out that, among illicit drugs, cocaine use among adults is in third place, with 1.7% who used the drug in the last 12 months, totaling 2,287,720 people in a total of 134,370,019 people surveyed. In relation to adults who have used the referred drug at least once in their lives, this number jumps to 5.1 million[7].

Cocaine is a highly reinforcing substance in the Central Nervous System (CNS). After administration and absorption into the bloodstream, it quickly reaches the brain, more specifically the reward circuit (mesolimbic system), the region where it predominantly exerts stimulant effects. It causes the blockage of neurotransmitter reuptake in the presynaptic cleft, leading to an increase in the amount of serotonin, dopamine and noradrenalin at the synapses, which, in turn, stimulate the postsynaptic receptors.

The dopamine then continues bombarding the receptors, leading the user to the sensation of pleasure[8]. In the long term, however, a decrease in the availability of dopamine and serotonin in these areas is believed to occur, which has been associated with anhedonia (absence of pleasure) and the other withdrawal symptoms that the user experiences[9].

Among the several damages caused by cocaine consumption, the neurological ones deserve special reflection, among them, the attentional problems. It is evident that, despite the fact that the use of cocaine is growing and that there is an awareness about the causes of psychoactive substance consumption, there is a great influence of the environment and also a historical and cultural issue involving this type of act[10].

Regarding neurological damage, substance abuse is associated with damage in several brain areas, but especially in the prefrontal cortex. One of the cognitive processes associated with the prefrontal cortex, which is impaired by substance abuse, refers to attention and flexibility as a possibility to form and maintain concepts[11].

Attention is considered a biological basis, which can be altered due to factors such as impulsivity, compulsivity, and the regular use of cocaine. In people who use long-term, there are alterations in the dopaminergic transmission in the cortico-limbic pathways (located in the frontal lobe), which can cause atrophy (or structural alterations) in the cortico-subcortical area. The latter is responsible for the reticular activating system, which, in turn, is responsible for controlling vision, hearing, eye and body movement[12].

Attention is one of the basic psychological processes that have, by definition, "the mind's taking possession, clearly and vividly, of what seems like several simultaneously possible objects or chains of thought". To this end, focus and concentration of consciousness are essential[13].

The frontal lobes are of great importance in the formation of conscious activity, participating in the formation of intentional thoughts and in the individual's actions, having control of the dominant *foci*. They regulate the conscious activity by ensuring the selectivity of what will be accomplished by means of an objective. When there are massive lesions in the lobes, the inhibition of the intervening factors ceases, that is, there is a collapse which prevents a directed behavior, substituting it by repetitive acts and outside the objective presented[14].

Attention makes it possible to use some mental resources in the best possible way. By decreasing attention on some internal and external stimuli, such as sensations, thoughts, and memories, it is possible to focus on what matters at that moment, increasing the possibility of responding quickly to some stimuli, thus memorizing and remembering more easily what is presented[15].

Attention can bring benefits when it is conscious. Besides its own value, conscious attention fulfills three roles in relation to its cognitive role: it monitors interactions with the environment, maintaining awareness about adaptations and situations; it relates the past and the present, involving memories and sensations so that they have a congruent meaning, and can even help as a basis for personal identity; it assists in planning and control over present or future actions[15].

Within the attentional process, there is a division of several types of attention, called selective attention, alternating attention, sustained attention, concentrated attention, and divided attention[16].

Selective attention is the process by which stimuli are selected for further processing while others are ignored. In vision, the primary means of directing attention is eye movements. The same is also true for hearing. Generally, one can hear selectively using cues, such as the direction from which the sound is coming and the characteristics of the speaker's voice. Alternate attention is responsible for the ability to maintain focus on an object while simultaneously performing a task[17]. Finally, sustained attention is the ability to persist attention on a specific stimulus or sequence of stimuli[16]. Concentrated attention consists of the ability to focus, select, and sustain attention on target stimuli in the face of multiple other stimuli available in the same environment[18]. In addition to these, one is also reminded of divided attention, in which "we prudently allocate our available attention resources to coordinate our performance on more than one task at a time"[15].

The attentional impairments are confirmed by a study showing that in heavy drug users there is a deficit in sustained attention and in the execution of complex tasks, thus not retaining and sustaining attention for a long period. Individuals in abstinence present a lower inhibitory capacity, as well as in the coordination and manipulation of information[19].

Given these findings, this study is important to know the importance of Neuropsychology for the evaluation of neuropsychological constructs, such as executive functions, since attention is one of them, as well as to understand how cocaine can cause damage and harm to the attentional aspects within the basic psychological processes. In this way, it is also expected that this study will contribute to the future elaboration of other researches that will contribute to the reduction of insidious risk factors.

Method

This is a descriptive study, with a quantitative, case-control approach. The use of instruments allows testing hypotheses, more concrete results and, consequently, less susceptible to misinterpretation.

The subjects of this research were patients, of legal age, who used a Psychosocial Care Center (PSCC) and were abusive and/or dependent on cocaine. Besides these, we also used a sample of people that were not users of PSCC, in this case, students of the Psychology course of a University in the ABC region and that were not users of cocaine, so that we could make a comparison of the attentional damage caused by the use of cocaine.

The inclusion criteria were considered to be being monitored in PSCC and users and/or addicts of cocaine or crack, as well as university students who did not use the same drug. The exclusion criteria were users of PSCC who used other drugs and university students who used cocaine and who were not students of the Psychology course or from the university researched.

The User Group sample was calculated by convenience, that is, as it was possible to find volunteer participants who fit the inclusion criteria and the Control Group participants were chosen randomly, that is, they were drawn from a class of Psychology undergraduate students.

The following instruments were used for this research: Criterion Brazil Questionnaire for the socioeconomic description of the participants and, for the sociodemographic classification of the subjects, an identification questionnaire with questions related to age, gender, religion, race, marital status, education, and socioeconomic level (available from http://www.abep.org).

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) was developed by researchers from several countries under the coordination of the World Health Organization (WHO) and, consequently, was translated into several languages, including Brazilian Portuguese, having already been tested for validity and reliability[20]. This is a structured questionnaire containing eight questions that assess the consumption of nine classes of psychoactive substances (tobacco, alcohol, marijuana, cocaine, stimulants, sedatives, inhalants, hallucinogens, and opiates). The questions address the frequency of use in life and in the last three months, problems related to use, concern about use on the part of people close to the user, impairment in the execution of expected tasks, unsuccessful attempts to stop or reduce use, feeling of compulsion, and injecting use.

The Psychological Battery for Attention Assessment (PBA) aims to perform an assessment of the general attentional capacity, as well as an individualized assessment of specific types of attention, namely, Concentrated Attention (CA), Divided Attention (DA), and Alternate Attention (AA)[21]. It consists of three tests, each of which aims to assess one of the proposed attentional types. In turn, the analysis of the three tests together provides the measure of general attention. The tests were built from several abstract stimuli that were used to compose the three answer sheets (CA, DA and AA), sometimes as target stimuli, sometimes as distractor stimuli. The distribution of stimuli follows the same quantity in each instrument, containing 400 stimuli distributed in 20 lines with 20 stimuli each. Of the total, 120 are target-stimuli (maximum possible score) and 280 are distractors[21]. The final result of each test is obtained by considering the target stimuli that the person scored,

subtracting the errors and omissions he committed. In this way, the total number of points is arrived at. In the case of general attention span, the result is obtained by adding the total points for each of the tests (CA+DA+AA), with a maximum of 360 points. As for the application time, in the case of the CA, it is two minutes; for the DA, four minutes; and for the AA, two minutes and 30 seconds. The order of application must be strictly followed, starting with the CA, followed by the DA, and finally the AA. The application can be individual and collective[21].

The Free and Informed Consent Term (FICT) explained to the participant that he would answer the questionnaires and the test under the guarantee of confidentiality of his information and anonymity. It also emphasized that the participant could withdraw at any time and that his or her participation was free, that is, it did not imply expenses or any kind of receipt of remuneration or payment.

All the instruments mentioned above were used in both groups. The ASSIST instrument was used based on and reaffirmed by updated research[20-21]. They were chosen to better measure what was being proposed. Each of the instruments collected information that was fundamental to the formation of the results of this research.

The research was carried out at PSCC. According to the Ministry of Health, this has as its priority the care of users with mental disorders, aiming at well-being and better social insertion, having intensive, semi-intensive, and non-intensive treatment regimes. It is also responsible for training and supervising primary care teams, as well as contributing to other programs in the area[22]. There was also a collection at the Psychology School Clinic of the Methodist University of São Paulo.

Contact was made with the two institutions (PSCC and the Higher Education Institution) for the approval of the research (data collection) for submission to the Research Ethics Committee and the beginning of the collection with users of PSCC and students of the university.

After identifying who were the patients that fit as subjects of this research, a pilot test was carried out with two patients to verify their ability to understand the instruments that were used in the research. After the pilot phase, data collection began. The same process was done with the university students.

The participants were informed about the reasons for the research and consulted about their desire to participate or not. In order to participate in the research, all of them received the FICT in which they were given all the research information. After signing the form, they were then considered as subjects of the research.

In addition to PSCC patients, we also collected data from other volunteers who were not PSCC patients, were of legal age and were not users of cocaine in order to compare the attentional data of consumers and non-users of cocaine and other drugs in general, in this case, students from UMESP.

Data collection was conducted at the beginning of 2019. The participants answered the questionnaire within their respective institutions. In total, 25 volunteers participated in the research, being divided into 15 participants in the Control Group and ten participants in the User Group. The comparison of data was performed using a chi-square statistical test.

The participants, in case they felt any sensitization caused by the research, could count on the support of the researchers, as well as on the professionals of these institutions.

The data was treated with descriptive statistics, which has the basic objective of synthesizing a series of values of the same nature, allowing an overview of the variation of these values, organizing and describing the data through descriptive measures.

This study was guided by Resolution 466/12 of the National Health Council (NHC)[23], The study was submitted to and approved by the Ethics and Research in Human Beings Committee under protocol number CAAE 02680218.5.0000.5508.

Results

The research was divided in two stages. The first was done with Psychology students to measure the abuse and/or dependence on alcohol, tobacco and other drugs, but especially the use of cocaine. The second part of the research was the collection of data with patients from a PSCC located in the ABC region.

Besides the consumption of alcohol, tobacco and other drugs, the research was dedicated to raising the indices on the psychological construct Attention, in both groups, with the objective of comparing the performance of attention between the groups and to verify the possible associations between cocaine and attention, being these alternate, divided, concentrated and general (the last one is an average of the three attentions).

The Control Group was mostly female (86.6%) and mainly composed of young adults (73.3%). The ethnic group was all white, mostly single (66.6%), and more than half of the participants said they lived with relatives (60%). On the other hand, only 40% claimed to live with a spouse or alone. A little more than half of the respondents said they had some job (53.3%) and those who said they did not have any job were 46.6%. It was also detected, in the sample, a higher proportion of those who said they had some religion (60%) against 40% who said they had no religion. Regarding social status, most of them were in the B1/B2 group, socioeconomic strata,

in which family income varies, between nine and eighteen thousand, approximately 66.6% of the sample.

The second group, called the User Group, was composed of a sample of subjects who attended PSCC. The sample was mostly male (70%) and composed of young adults. Almost all subjects were brown, mostly single (70%), and 60% lived with spouses or alone. Half of the interviewees were employed, 60% of the participants were religious, and in relation to social status, they were mostly in the lower social classification (C1/C2/D), representing 70% of the subjects.

The instrument to measure the consumption of alcohol, tobacco and other drugs, ASSIST, offered three types of informative data: lifetime use, use in the last three months, and need for some type of intervention.

In the control group, in relation to lifetime consumption, it was noted that, significantly, 93.3% of the sample had already consumed alcohol at some point in their lives. Next, the legal drug of greater use was tobacco (60%), followed by the illicit drug marijuana (60%). Next, the most consumed illicit drugs were hallucinogens, with 26.7% of the sample, and amphetamines/ ecstasy, with 13.3%. Finally, among the illicit drugs with lower incidence were detected: cocaine, inhalants, and hypnotics/ sedatives, with 6.7%. The use of opioids and injectable drugs was not found in the sample.

In the User Group, the absolute use of alcohol, tobacco, marijuana and cocaine/crack (100%) drew attention, in which all had used at least two of these substances in the last three months. In relation to illicit drugs, the consumption of hallucinogens (80%), marijuana (70%), amphetamines/ecstasy (60%), inhalants (30%), hypnotics/sedatives (10%), and opioids (10%) were noted.

Regarding the consumption of alcohol, tobacco and other drugs in the last three months, the Control Group showed low incidence for tobacco use, since 73.3% of the sample said they had not consumed it in the last three months. Regarding alcohol use, there was a majority for weekly consumption (33.3%), which, when added to monthly consumption, still did not show an absolute majority (46.6%). Among the illicit drugs, it was noticed a greater expressiveness in the consumption of marijuana, since 13.3% consumed it monthly. For the other drugs, no incidence was noted, except for hypnotics/sedatives, which were found to be used once or twice in the last three months (6.7%).

In the User Group, in the last three months, it was noted, in relation to licit drugs, that 80% used tobacco daily or almost every day. Adding the weekly use, which can be consumed daily or almost every day, the sample reached 100% of consumption. When observing the illicit drugs, it was noticed a high incidence for the use of cocaine/crack around 90%, taking into consideration the weekly use and daily or almost every day use. For marijuana use, 20% used weekly; for amphetamines and ecstasy, 20% used once or twice. In contrast, in relation to hallucinogens, 10% said they had used or twice and/or monthly.

Regarding problems related to alcohol, tobacco and other drug use, the Control Group showed that only 6.7% of tobacco users needed treatment. On the other hand, tobacco users (20%), alcohol users (33.3%), and marijuana users (26.7%) required brief interventions. In relation to the consumption of other drugs, there were no rates for interventions.

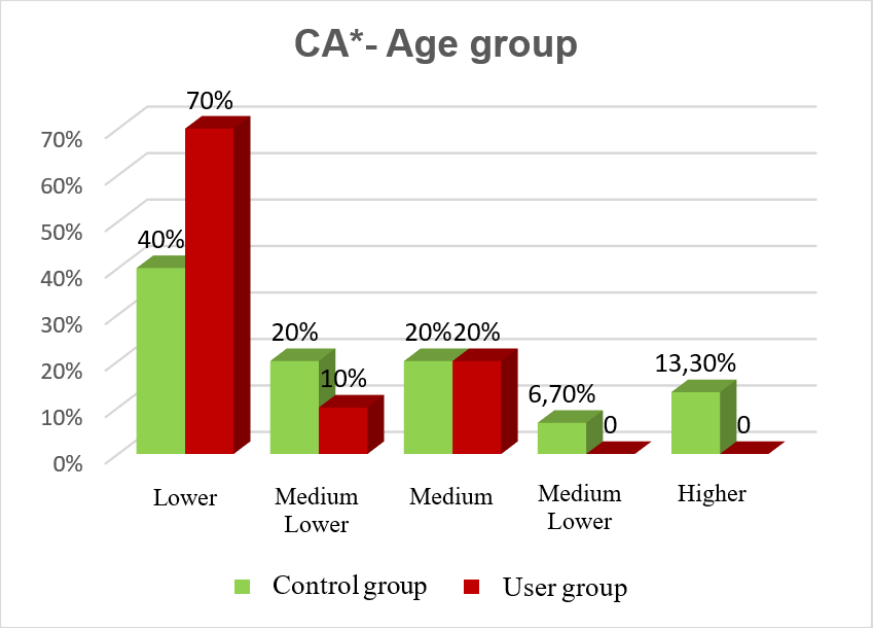
In the User Group, regarding licit drug problems, of the tobacco users, 50% needed treatment and 30% needed brief intervention. Of the alcohol users, 60% needed treatment. Regarding illicit drugs, of the marijuana users, 40% needed brief intervention. For crack/cocaine users, 40% were for treatment and 60% for brief intervention. For hallucinogenic drugs and amphetamine/ ecstasy, 20% needed brief intervention and only 10% needed intervention for inhalant use.

In relation to the Psychic Attention construct, the PBA instrument presented the data referring to age and education.

In the Control Group, it was noted that, in CA, DA and AA, by age group, in CA, there was predominance of Lower Answers (40%); in DA, Medium Higher (33.3%) and, in AA, Higher (tying with Lower, representing 26.7%). In relation to the results *per* schooling, there was a predominance of Lower Answers (46.7%) for CA and Medium Lower (53.3%) for DA, being that, in AA, the quantity of people who stayed in the Lower or Medium Lower category is the same (26.7%).

Regarding the User Group, it was observed that, in CA, DA and AA, by age group, there was a predominance of Lower Answers for CA (70%) and AA (60%) and Medium Lower Answers for DA (50%). By education, there was a predominance of Lower Responses in CA (70%) and AA (70%) and a predominance of Medium Lower Responses (50%) in DA.

In general, it was noted that the Control Group, although they use some substances, such as tobacco and alcohol, showed better performance of responses when compared to the User Group, which, in turn, used other substances, the main one being cocaine. The following sample was delineated by age group, as shown in Figure 1, since the schooling of the groups is very distinct.

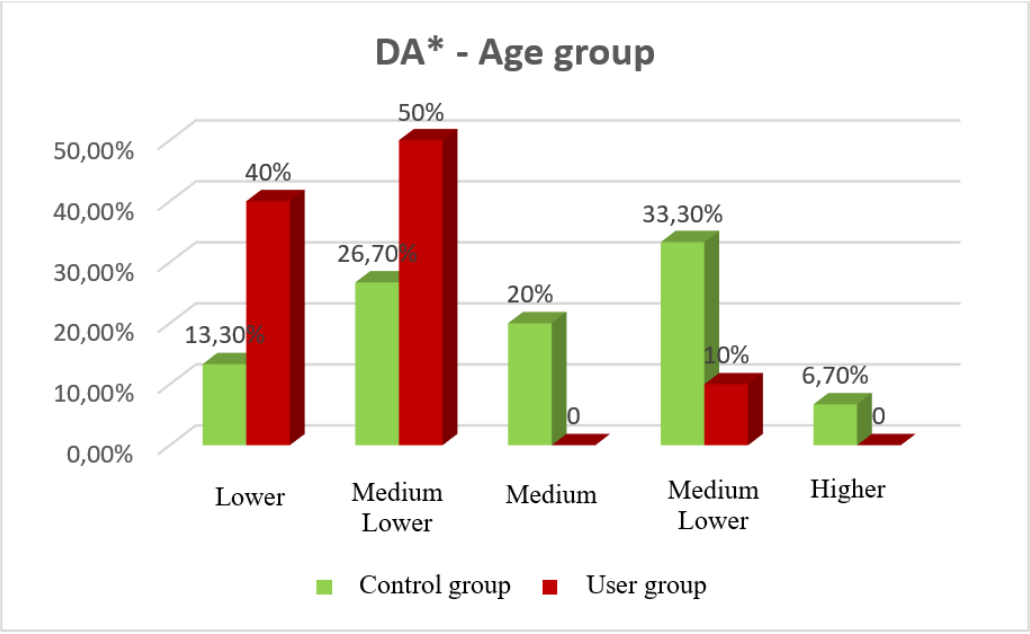


*CA = Concentrated Attention

Figure 1 - Comparison of results of the Psychological Battery for Attention Assessment (PBA) in CA* by age group. São Bernardo do Campo, SP, Brazil, 2019

In relation to CA, in Figure 2, it can be seen that the Control Group had a better performance by representing, in general, the percentile in the Medium Higher and Higher ranges, while the User Group showed a lower performance by the 70% percentile of frequency in the Lower category and tied with the Control Group by the 20% percentile, being classified as the expected average for their age.

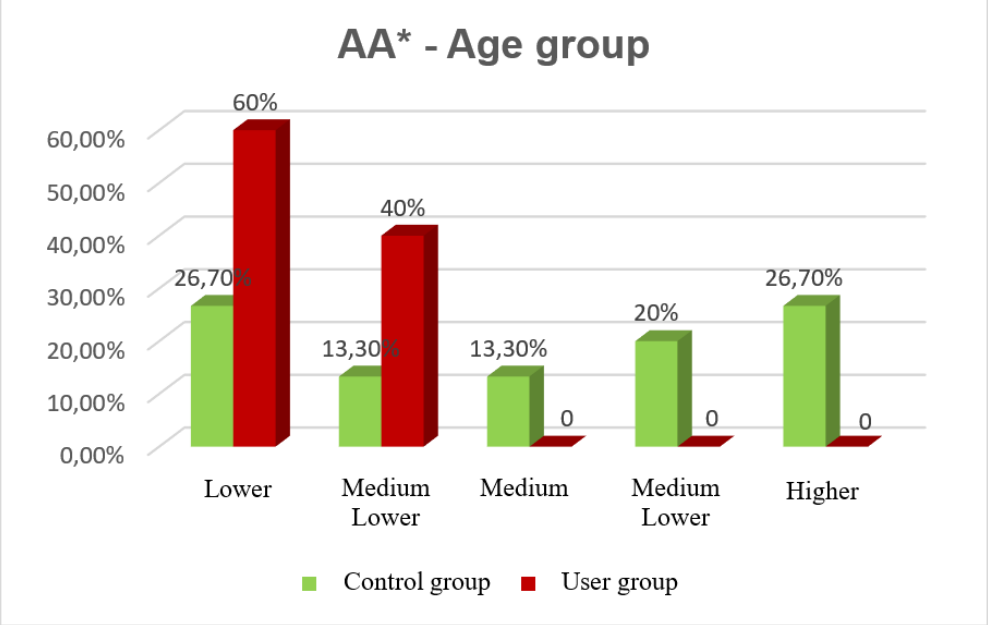
In the DA, the groups presented scores in the categories below and above average, as shown in Figure 3, aiming to highlight the User Group's single higher average. However, the Control Group obtained other percentages such as Medium, Medium Higher, and Higher, which, when compared to the User Group, demonstrated a higher percentage above the average.



*DA = Divided Attention

Figure 2 - Comparison of results of the Psychological Battery for Attention Assessment (PBA) in DA* by age group. São Bernardo do Campo, SP, Brazil, 2019

Finally, the AA was the one in which the Control Group showed the highest performance by the percentages Medium Higher and Higher. The User Group, on the other hand, had its highest scores in the categories Lower and Medium Lower than expected.



*AA = Alternate Attention

Figure 3 - Comparison of results of the Psychological Battery for Attention Assessment (PBA) in AA* by age group. São Bernardo do Campo, SP, Brazil, 2019

In addition to this information, there is an attention category, called General Attention, which is nothing more than the sum of all the test scores.

In Table 1, it is possible to see that, in General Care, the Control Group was distributed in the Lower, Medium Lower, Medium Higher and Higher categories, while the User Group was only distributed in the Lower and Medium Lower categories.

Table 1 - Comparative General Attention of the two groups. São Bernardo do Campo, SP, Brazil, 2019

VARIABLES	Control Group	Percentile	User Group	Percentile	Chi-square
	N=15		N=10		
General Attention - Age Group					
Lower	4	26.70%	6	60%	p<0.027
Medium Lower	5	33.30%	4	40%	p<0.036
Medium	-	-	-	-	
Medium Higher	5	33.30%	-	-	p<0.154
Higher	1	6.70%	-	-	p<0.227
General Attention - Schooling					
Lower	3	20%	8	80%	p<0.010
Medium Lower	8	53.30%	2	20%	p<0.041
Medium	-	-	-	-	
Medium Higher	3	20%	-	-	p<0.340
Higher	1	6.70%	-	-	p< 0.198

Regarding the Medium Lower classification, it is possible to notice that the groups had close results, but in the Lower, Medium Higher and Higher categories, the Control Group showed higher performance, as shown in Figure 4.

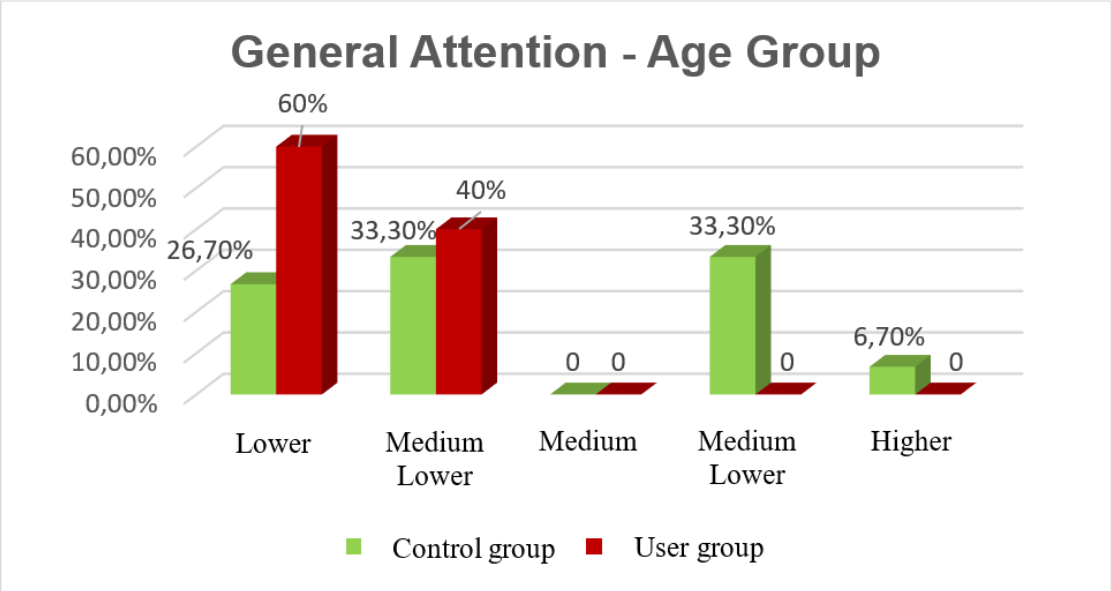


Figure 4 - Comparison of results of the Psychological Battery for Attention Assessment (PBA) summed (to form General Attention) by age group. São Bernardo do Campo, SP, Brazil, 2019

It was possible to observe the performance of attention by its categories, as well as in general, based on the study performed for the construction of the test (GAP) and, in this study, the comparison between the groups. However, through these facts, it is possible that the performance of the volunteers from the User Group, in the test, was lower than expected by the average. According to the ASSIST data, it was possible to notice that the User Group has the need for intervention for some substances, however, besides tobacco and alcohol, as in the Control Group, there was the need for intervention for the use of cocaine.

From this data, it was possible to verify that the use of cocaine is directly related to the performance of users when performing the test, since all users needed intervention or treatment according to the ASSIST, and also that the group had a low performance when performing the test. It is worth noting that the User Group did not use only one substance, and may have influences of other drugs in the test result.

Discussion

From the data collected in this research, it was possible to notice several factors that are related to the use of licit and illicit substances. It is noticed that the use of substances was present in the entire sample, whether in the Control Group or in the User Group. Researchers have made mentions, in a literature review, related to cocaine use, for example, in which 4% of the Brazilian population has used cocaine once in their lives, representing about 5.6 million people[24].

In the sample, it was evidenced by the ASSIST data that alcohol and tobacco were the most used by college students, followed by marijuana and hallucinogens. These data reaffirm the notes of researchers[24] that substance use has been increasing, as well as researchers have commented on the use being a result of a socio-historical issue[10]. In the Criterionnaire Brazil, there were questions about the financial and social issue of each individual and, as shown earlier, it was noticeable that the User Group is in the lower social and financial classes than the Control Group. Consequently, the frequency and type of substance used were discrepant, presenting cultural and social issues that could be involved.

In a 2010 national survey on the use of alcohol, tobacco and other drugs among college students in the 27 Brazilian states[25], it was pointed out that alcohol is the most used substance among college students, just as it was possible to note, in this study, that alcohol and tobacco are among the substances most used by college students. The study included students under 18 years old to over 35 years old. Regarding substance use in life, alcohol is the most used by students in the 18-24 age group, and regarding tobacco, by students over 35 years old. Powder cocaine, hallucinogens, and ecstasy

have the highest frequency of use by college students aged 25-34[25].

Besides the information demonstrated, in this research the attentional damage caused by cocaine use was perceived, corroborating what was found in the literature[26] in which neurological changes through substance use in general were mentioned, and the authors also reported that both cocaine addicts and cocaine users have deficits in attention[27].

In a study with a sample of 30 adolescents, 15 were substance dependent and 15 were not dependent on any substance. Regarding the substances the addicts used, seven were dependent on alcohol, 13 on tobacco, seven on marijuana, six on inhalants, and six on cocaine/crack. The addicts submitted to the tests showed impaired performance in terms of cognitive and executive functions in performing tasks, being linked to the functioning of the medial, dorsolateral, and posterior areas of the prefrontal cortex. Their findings showed that substance use during adolescence can compromise the neuromaturation processes formed in childhood, that is, the degradation of the white matter[26].

As previously presented, the frequency with which the User Group used some substance in the last three months is higher than the Control Group. It should also be considered that the Control Group, although it obtained higher percentages than the User Group, also maintained a low performance regarding the results below the average, in agreement with studies[8-28].

From the results of the research, it was noted that, under the conditions in which the User Group found themselves, both due to social and cultural issues and in relation to substance dependence, it was noticeable and associable that the abusive use of these substances corroborated a performance below that expected, as shown. However, an unusual factor noticed in the results was that one of the results by age group was in the medium higher range.

According to a study[29], Chronic cocaine users who have attention deficit, diagnosed with ADHD, have tendencies to present impairments in inhibitory functions. In this study, the instrument "Adult Self-Report" was used, being an Achenbach System of Empirically Based Assessment (ASEBA) scale. From the results of the work, it is possible to relate the attention deficit with the chronic use of cocaine, being explained by the sensitivity in the reward system, since the study relied on neurological images.

In general, it is noticeable that further studies are needed for more concrete data, however, the sample relied on internal and external factors, such as financial situation, social status and feelings, as well as the Control Group and the User Group do not use only one substance, which makes it difficult to concretely cause these results.

Conclusion

Licit and illicit drugs are unquestionably bad for your health, as is already known. The damage caused is not only physiological, but also psychological.

Among the important points of this study was the importance of Neuropsychology, as well as the comparison between the two groups. However, it was noticeable, for greater relevance, the need for a larger sample.

This study revealed how cocaine interferes in the execution of basic psychological processes, both in users and addicts, focusing on attentional impairment. Therefore, once again, the caveats previously made to avoid such consumption are valid.

This study allows the possibility to reflect on the damage caused by the use of cocaine and opens new perspectives for the discovery of other harms of the use of the same drug.

References

1. American Psychiatric Association. DSM-5: Manual diagnóstico e estatístico de transtornos mentais. Porto Alegre: Artmed Editora; 2002.

2. United Nations, Office on Drugs and Crime. Global illicit drug trends 2003 [Internet]. New York: UN; 2000 [cited 2021 Jul 7]. Available from: https://www.unodc.org/pdf/trends2003_www_E.pdf

3. Centro Brasileiro de Informações sobre Drogas Psicotrópicas. Livreto informativo sobre drogas psicotrópicas [Internet]. São Paulo: CEBRID; 2011 [cited 2021 Jul 7]. Available from: https://www.cebrid.com.br/wp-content/uploads/2012/12/Livreto-Informativo-sobre-Drogas-Psicotrópicas.pdf

4. Galduróz JCF, Noto AR, Fonseca AM, Carlini EA. V levantamento nacional sobre o consumo de drogas psicotrópicas entre estudantes do ensino fundamental e médio da rede pública de ensino nas 27 capitais brasileiras: 2004. São Paulo: CEBRID; 2005.

5. Carlini E, Galduróz JCF, Noto A. IV levantamento sobre o uso de drogas entre estudantes de 1º e 2º grau em 10 capitais brasileiras. São Paulo: UNIFESP/CEBRID; 1997.

6. Vargens RW, Cruz MS, Santos MA. Comparison between crack and other drugs abusers in a specialized outpatient facility of a university hospital. Rev. Latino-Am. Enfermagem. 2011;19(spe):804-12. https://doi.org/10.1590/S0104-11692011000700019

7. Laranjeira R, Madruga C, Pinsky I, Caetano R, Mitsuhiro S, Castello G. II levantamento nacional de álcool e drogas (LENAD)-2012. São Paulo: Instituto Nacional de Ciência e Tecnologia para Políticas Públicas de Álcool e Outras Drogas/Universidade Federal de São Paulo; 2014.

8. Cunha PJ. Alterações neuropsicológicas em dependentes de cocaína [Thesis]. São Paulo: Universidade

de São Paulo; 2005. https://doi.org/10.11606/T.5.2005.tde-13102014-101941

9. Lacayo A. Neurologic and psychiatric complications of cocaine abuse. Neuropsychiatry Neuropsychol Behav Neurol. 1995;8(1):53-60.

10. Sanchez ZM, Nappo SA. Seqüência de drogas consumidas por usuários de crack e fatores interferentes. Rev Saúde Pública. 2002;36(4):420-30. https://doi.org/10.1590/S0034-89102002000400007

11. Serafim AP, Saffi F. Neuropsicologia forense. Porto Alegre: Artmed Editora; 2015.

12. Rosa JT, Silva ND, Laitano S. Cérebro, inteligência e vínculo emocional na dependência de drogas. São Paulo: Vetor; 2003.

13. James W. The principles of psychology. Adelaide: Read Books; 2013.

14. Vygotsky LS. Aprendizagem e desenvolvimento intelectual na idade escolar. São Paulo: Ícone; 1988.

15. Sternberg RJ. Psicologia cognitiva. Padova: Piccin; 2000.

16. Marín RFJ. Relação entre os Testes de Atenção Concentrada (TEACO-FF) e de Atenção Dividida (AD). Psicol Argumento [Internet]. 2017 [cited 2020 Dec 7];28(62):225-34. Available from: https://periodicos.pucpr.br/index.php/psicologiaargumento/article/view/19801

17. Rueda FJM. Teste de atenção dividida (TEADI) e Teste de atenção alternada (TEALT). São Paulo: Casa do Psicólogo; 2010.

18. Benczik EBP, Leal GC, Cardoso T. A utilização do teste de atenção concentrada (AC) para a população infanto-juvenil: uma contribuição para a avaliação neuropsicológica. Rev Psicopedag [Internet]. 2016 [cited 2020 Dec 7];33(100):37-49. Available from: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S010384862016000100005&lng=pt&tlng=pt

19. Kolling NM, Silva CR, Carvalho JCN, Cunha SM, Kristensen CH. Avaliação neuropsicológica em alcoolistas e dependentes de cocaína. Aval Psicol [Internet]. 2007 [cited 2020 Dec 7];6(2):127-37. Available from: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S167704712007000200003&ln=pt

20. Henrique IFS, De Micheli D, Lacerda RB, Lacerda LA, Formigoni MLOS. Validação da versão brasileira do teste de triagem do envolvimento com álcool, cigarro e outras substâncias (ASSIST). Rev Assoc Med Bras. 2004;50(2):199-206. https://doi.org/10.1590/S0104-42302004000200039

21. Rueda FJM. Bateria psicológica para avaliação da atenção (BPA). São Paulo: Vetor; 2013.

22. Vieira NG Filho, Nóbrega SM. A atenção psicossocial em saúde mental: contribuição teórica para o trabalho terapêutico em rede social. Est Psicol. 2004;9(2):373-9. https://doi.org/10.1590/S1413-294X2004000200020

23. Ministério da Saúde (BR), Conselho Nacional de Saúde. Resolução 466/12, de 12 de dezembro de 2012 [Internet]. Diário Oficial da União, 13 jun 2013 [cited 2020 Dec 7]. Available from: https://conselho.saude.gov.br/resolucoes/2012/Reso466.pdf

24. Abdalla RR, Madruga CS, Ribeiro M, Pinsky I, Caetano R, Laranjeira R. Prevalence of cocaine use in Brazil: data from the II Brazilian national alcohol and drugs survey (BNADS). Addictive Behav [Internet]. 2014 [cited 2020 Dec 7];39(1):297-301. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0306460313003213

25. Andrade AG, Duarte P, Oliveira LG. I Levantamento Nacional sobre o uso de álcool, tabaco e outras drogas entre universitários das 27 capitais brasileiras [Internet]. Brasília: Secretaria Nacional de Políticas sobre Drogas; 2010 [cited 2020 Dec 7];1:284. Available from: http://palestrasdiversas.com.br/Nelson%20%20Temas%20Diversos%20XXXI/Levantamento%20Nacional%20Sobre%20Drogas.pdf

26. Cunha PJ, Oliveira PA, Cortezzi M, Busatto GF, Scivoletto S. Executive dysfunction and low academic attainment in adolescent substance abusers with a history of maltreatment. Medical Express. 2015;2(6):M150506. https://doi.org/10.5935/MedicalExpress.2015.06.06

27. Fuentes D, Malloy-Diniz LF, Camargo CHP, Cosenza RM. Neuropsicologia: Teoria e Prática. Porto Alegre: Artmed Editora; 2014.

28. Matos FKCO, Lima TR, Fernandes J, Toma AMC. A contribuição da neuropsicologia na reabilitação das funções prejudicadas pela dependência de cocaína e/ou crack: uma revisão da literatura brasileira. Rev Científica UMC [Internet]. 2018 [cited 2020 Dec 7];3(2). Available from: http://seer.umc.br/index.php/revistaumc/article/view/236

29. Cancian ACM, Germano LDS, Cerutti F, Oliveira MS. Transtorno de déficit de atenção e hiperatividade e cocaína-crack: o que indica a comparação entre grupo de usuários e não usuários?. SMAD, Rev Eletr Saúde Mental Álcool Drog [Internet]. 2018 [cited 2020 Dec 7];13(2):78-85. Available from: http://www.revistas.usp.br/smad/article/view/149361

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All authors approved the final version of the text.

Conflict of interest: The authors have stated that there are no conflicts of interest.

Received: Dec 8th 2020
Accepted: Jun 3rd 2021

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