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SUBSTANCE ABUSE EFFECT ON COGNITIVE ABILITY OF SELECTED YOUNGSTERS STUDYING IN GWADABAWA, SOKOTO STATE, NIGERIA

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Abstract

Substance abuse is among the major issues affecting schools and education in Nigeria. Many substances affect the mind and whole body of youngsters negatively leading to hospitalizations, school drop-outs, absenteeism and other effects that affect education at whole. The objective of this study was to assess the effect of substance abuse on cognitive potential of some schooling youngsters in Gwadabawa, Sokoto State Nigeria. 15 young people that abuse substances and are attending schools, and 15 normal people in Gwadabawa, Sokoto state, Nigeria were recruited in this work and were assessed with Montreal cognitive Assessment standard methods to evaluate the cognitive domain of the participants. The result reveals substance abusers scored 357 ± 7.0, while 396.0 ± 10.0 was scored by non-substance abusers; indicating that substance abusers show comparatively lower cognitive ability compared to the control youngsters enrolled in this work. The results indicate that the substances been abused by the young people reduce their cognitive ability (a prelude of cognitive domain of the participants of the study) and in turn could inflict their academic performances as well. Thus, it is pertinent to help young ones shun substances through awareness creation, counselling, strict laws, drug education and relations.

Keywords: Substance Abuse, Drug Abuse, Cognitive Ability, Cognitive Domain, Cannabis, Cigarette, Academic Potential

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INTRODUCTION

Learning is an important aspect of life in all human endeavors. Learning educate people for the progress and growth of "self" and the country (Waheed, 2016). On many occasions learning occurs at schools, the major tools for shaping human lives to achieve greatness (Siti, 2017). At school or elsewhere objectives in education are set and struggled to be attained. Mostly, three domains objectives in education include cognitive, psychomotor, and affective things (Waheed et al., 2021). Cognitive achievement or ability of students are evaluated in terms of things such as skills, understanding and relations (Eshun & Mensah, 2013; 2017; Ennis Bitok, 2020).

Noteworthy, the biological body of humans always act in the dictates of cognitive domain (because brain and central nervous system are responsible for controlling the body metabolism required to live, and physical movements) that in turns affect the other objectives/domains of learning such as affective or psychomotor. Humans act based on their faculty of awareness (either good or bad) stored in the nervous system (Bitok, 2020). Cognitive domain encompasses things such as knowledge, understanding, application, analysis, synthesis, evaluation etc (See Figure 1) (Eshun & Mensah, 2013). It reveals the successes of learning and potential for development of cognitive and psychomotor skills in students (Katam & Jepchirchir, 2018).

Major Categories	Description	Key Words
Knowledge	Remembering previously learned material, from specific facts to complete theories, but all that is required is recall. That is, ability to recall previously learned material.	Defines, describes, identifies, knows, labels, lists, matches, names, recalls, recognises, reproduces, selects, states.
Comprehension	The ability to grasp or construct meaning from material. (Lowest level of understanding).	Comprehends, converts, defends, distinguishes, estimates, explains, extends, generalizes, infers, interprets, paraphrases, predicts, rewrites, summarizes, translates.
Application	Ability to use learned material, or to implement material in new and concrete situations.	Applies, changes, demonstrates, discovers, constructs, manipulates, modifies, relates, operates, predicts, prepares, solves, uses.
Analysis	Separate concepts or material into component parts and show relationships between parts. Distinguish facts from inference.	Analyses, compares, contrasts, differentiates, discriminate, identifies, illustrates, infers, separates.
Synthesis	The ability to put parts together to form a coherent or unique new whole, with emphasis on creating a new meaning, structure or relationships.	Categorises, combines, compiles, composes, creates, designs, explains, modifies, organises, plans, relates, revises.
Evaluation	The ability to judge the worth of material against defined or stated criteria	Appraises, compares, concludes, contrasts, criticises, defends, describes, explains, discriminates, evaluates, interprets, justifies, relates, summarises.

Figure 1: Showing some cognitive domains, Source: Eshun & Mensah, (2013)

Historically, the subjective and objective use of substances by humans have been practiced from the time immemorial to date. Some substances are utilized to cure illnesses and problems. However, nowadays substance abuse is increasingly becoming a concern in the societies across the world continents (Dikko et al., 2022). Substance abuse is leading many young people to negative effects such as social, physical, and cognitive detriments. Many homes, marriages, schools, youngsters were destroyed through the incitement of substance abuse nowadays (Adeniyi, 2022). Many reports decried the effects of substance abuse such as declining academic performance, school violence, school absenteeism, and increased prevalence of school drop-outs in the society. Cognitive problems due to substance abuse could easily precipitate learning deficits, and academic achievements as well (Umar et al., 2023).

Nevertheless, all substances (drugs) affect the human brain, they alter mind and feelings. They reduce motor coordination, impair creative mind, distort judges, and impair memory. Thus, youngsters abusing drug substances are at the verge of been affected by reduce cognition and reduced ability to properly think or act (Possi, 1999). Possi (1999) reports that experimental study using some drugs (substances) shows the effects of drugs including reduce memory, distorted judgement, hallucinations, excitability, aggression, etc. Abulaal et al., (2023) in their work among adolescents found that, substance use disorders significantly affect health and are coupled with cognitive dysfunction. There was low attention and poor problem solving among the study subjects. Vilchez (2018) decried that, drug abuse impairs central nervous system, alter consciousness, and behavior. The effects may be ensured by the drug through actions on neurotransmitters and neuromodulators. Substance abuse alter "functional systems" such as learning, memory, slow cognition, and executive functions. Ibrahim etal (2021) opined the view that substance abuse negatively affect health, life, and academic of many young people in Sokoto and rest parts of the world. Schools or higher institutions are meant to guide students to become useful members of the society for growth and development. On the other hand, learning institutions are threatened by the global spread of substance abuse scourge. Substance abuse affects schools' education, and school actors. Ibrahim et al., (2022) in Sokoto study decried that substance abuse is a limiting factor to academic performance of some students in Sokoto, Nigeria. Therefore, the objective of this work was to assess the effect of substance abuse on cognitive ability of some youngsters in *studying* in Gwadabawa, Sokoto State Nigeria.

METHODS

This work was done in Gwadabawa, Sokoto state, Nigeria among 30 respondents (15 schooling youngsters that abuse substances, and 15 schooling youngsters that act as normal cohorts). The cognitive ability of the study participants was assessed according to modified Montreal Cognitive Assessment (MCA) methods related in Zaky et al., (2021); Roseweigh (2023) and Sarkingobir etal., (2023).

Research Design

The study design used in this study was a cross-sectional survey among respondents that abuse substances (cigarette, syrup, and cannabis) and normal cohorts.

Instrumentation

The main instrument applied in this work was Montreal Cognitive Assessment sheet.

Process

"The process used in this work was Montreal Cognitive Assessment, a simple cognitive testing tool that determines mild cognitive problems by testing attention and concentrations, memory, executive functions, orientation, language, calculations, visuoconstructional skills, and thinking. The assessment is carried out in the timeframe of 10-15 minutes, and a score of 26 or 30 above is normal. The following tips were used (as indicated in Figure 2)" (Sarkingobir et al., 2023):

Alternating Trail Making

"The respondent was asked to draw a line, starting from number 1 to letter A and up-to number 5 and letter E; without a line that cross or any error. The score is 0 if an error occurs" (Sarkingobir et al., 2023).

Visuoconstructional Skills

"The respondent was asked to draw a cube accurately. 1 point is given for a corrected drawing".

Visuoconstructional Skills of Clock

"The respondent was instructed to draw a clock and set it at 10 past 11. Contour, numbers, and hands each had 1point mark" (Sarkingobir et al., 2023).

Naming

"Respondent was asked to name animals starting from lion, rhinoceros, and camel. One point is allocated for correct naming of any animal" (Sarkingobir et al., 2023).

Memory

"The administrator read 5 words during trail one, two, and three. After, the third reading, the respondent was asked to recall the words" (Sarkingobir et al., 2023).

Attention

"The administrator asked the respondent to read 5 numbers exactly as spoken. Then respondent was asked to repeat the words in backward" (Sarkingobir et al., 2023).

"Respondent was asked to tap his hand at each letter A. Point was not given for more than 2 mistakes".

"Serial of Subtraction beginning at 100. 4 or 5 right subtractions scored 3 points; 2 or 3 right subtractions score 2 points; less than 2 correct subtractions score 0 point. See Figure 2" (Sarkingobir et al., 2023).

Language

"Two sentences (one after the other) were read and respondent was asked to repeat. Correct repetition earned 1 point. Then, respondent was asked to mention words beginning with letter F. 1 words per second are given 1 point" (Sarkingobir et al., 2023).

Abstraction

"Respondent tell the similarities between words such as banana and orange= fruit, train and bicycle= transport, watch and ruler= instruments" (Sarkingobir et al., 2023).

Delayed Recall

"The respondent shall recall words with no cue; viz, face, velvet, church, Daisy, red. Each correct response had 1 point" (Sarkingobir et al., 2023).

Orientation

"The respondent was asked to tell the followings: date, month, year, day, place, city. Each correct answer earns 1 point" (Sarkingobir et al., 2023).

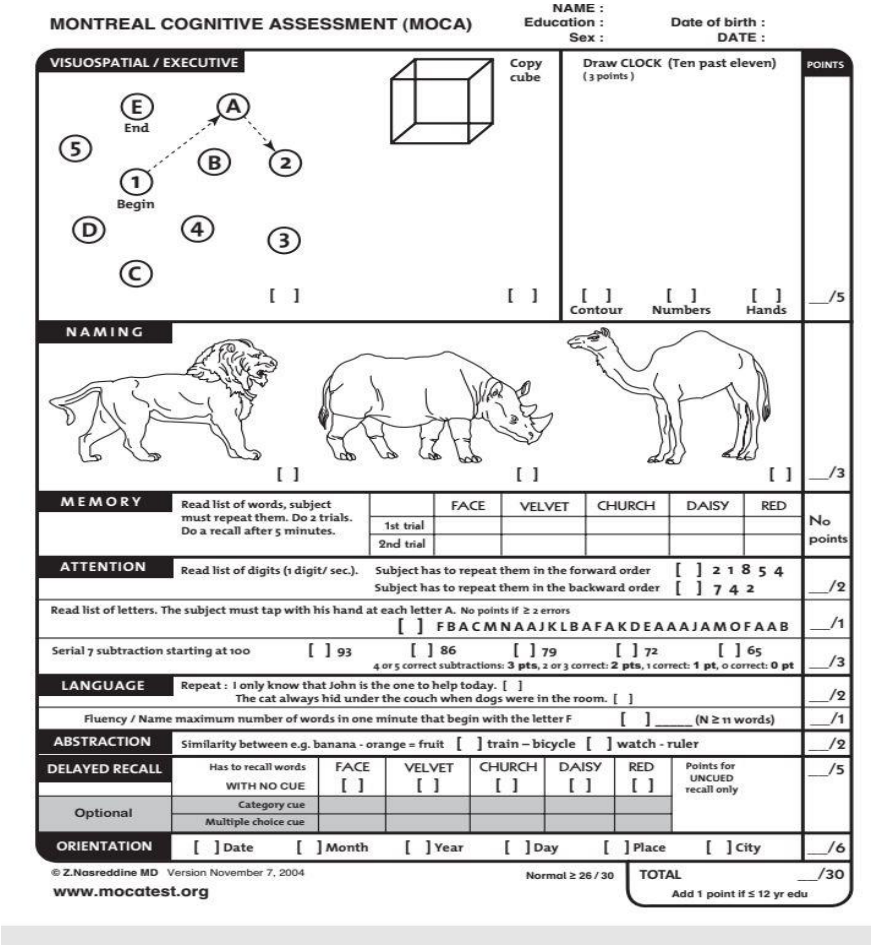

Figure 2: Showing a form used for MCA, Source: Montreal Cognitive Assessment, 2004.

RESULTS AND DISCUSSION

The result for this work were shown in Tables 1 and 2.

Table 1 *Summary of demographic characteristics of respondents enrolled in this study from Gwadabawa, Sokoto state, Nigeria*

Parameter	Frequency	Percentage
Age		
14-16 years	8	26.7
17-20 years	8	26.7
20 and above	14	46.7
Sex		
Male	30	100.0
Female	0	0.0

Religion		
Islam	30	100.0
Tribe		
Hausa/ Fulani		
Educational level		
Primary	6	20.0
Secondary	14	46.7
Tertiary	10	33.3
Types of substance of abuse		
Cannabis	5	33.3
Cigarette	5	33.3
Syrup	5	33.3

Source: Field data (2023)

Table 2 *Summary of Effect of substance abuse on cognitive ability of young students in Gwadabawa, Sokoto state, Nigeria*

Participants	N (individuals)	Mean marks	Std	Chi-square	Remark
Substance abusers consuming	15	357.0	7.0	40.101	Significant
Control/ normal cohort	15	396.0	10.0	1532.627	Significant
Total	30				

Source: Field data (2023)

Table 1 shows the demographic characteristics recorded from the youngsters involved in this study. They are males, Muslims (100.0%), and Hausa/Fulani (100.0%); 20.0% are at primary level of education, 33.3% are at tertiary level of education, and 46.7% are at secondary level of education. In terms of age, 26.75 are 17-20 years old, 26.7% are 14-16 years old; and 46.7% are 20 and above years old. Table 2 shows a summary of results of cognitive assessment of young drug abusers schooling in Gwadabawa, Sokoto state, Nigeria. The result reveals substance abusers scored 357 ± 7.0, while 396.0 ± 10.0 was scored by non-substance abusers; indicating that substance abusers show comparatively

lower cognitive ability compared to the control youngsters enrolled in this work. Certainly, cognitive domain in education or learning is very important and unavoidable figure that aid in in promoting learning outcomes. It is important to measure cognitive domain of learners to know the progress of learning and make amendments or further inputs. Cognitive domain is useful in the course of learning communications and activities as well. Cognitive domain aid students to acquire knowledge, develop critical thinking skills, and approach real life events properly (Ennis, 2017; Fitriani et al., 2021).

However, this study (Table 2) indicates that substance abuse among youngsters selected for this study negatively affects the cognitive ability, because substance abusers scored below the non-substance abusers. The finding showing effect of substance abuse on cognitive domain of youngsters (an important figure of learning) was similarly related by several studies elsewhere such as Manish & Neetu, (2020); Adeniyi, (2023); Ciuca Anghel et al., (2023). Parable, Muoti (2014) shows in a study of effect of drug abuse on academic performance of secondary schools in Kenya that, drug abuse instigates more drop-outs of school, poor interest in learning, poor relationship with peers, low concentration to learning, sleeping, confusion, headache, etc among others. Manish et al., (2020) reveal in their work that examined effect of drug abuse on academic performance of adolescent students that, effects such as sleeping, drowsiness, lack of concentration, impaired memory, and other effects.

Nevertheless, the reduction in cognitive ability displayed by this work (Table 2) is actually the translated effect of drugs or substances as mind-altering agents and metabolic outcomes of drugs (xenobiotics) by the human body (Umar et al., 2023). For example, substances such as cigarette, cannabis, and syrup are able to depress, and impair the brain (a center responsible for higher cognitive ability). On the other hand, substances when abused are turned to more harmful intermediates by the body (in the course of xenobiotics biotransformation) that in turn affects the body in numerous ways (Ciuca Anghel et al., 2023). Effects such as physical health problems, and mental health problems elicited by substances abuse in young leaners result in injuries, hospitalizations, absenteeism, and overall academic problems or deficits (Umar et al., 2023). Therefore, for better learning, students shall be guided to shun or stop substance abuse through the utilization of combination of efforts such as counseling, drug education, and strict implementation of drug laws at schools and homes (Costantine-Simms et al., 2020).

CONCLUSION

Learning is importantly significant especially among the youngsters (the tools for future growth and development). Learning occurs through the use of cognitive ability (among other factors) of learners to respond to teaching instructions. However, the pervasive drug abuse prevalence in nowadays societies is affecting learning of youngsters; thus, the study examined the effects of substance abuse on cognitive ability of youngsters in Sokoto (Gwadabawa) and the results show that substance abuse affects cognitive ability of the schooling substance abusers.

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