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Study of the effect of time duration of marijuana abuse on memory

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Abstract: *The present study was conducted to assess the effect of time duration of marijuana abuse on memory which based on a sample of 90 people from three different groups. This group represents the involvement of marijuana abuse in a different time periods that was 2 years, 4 years and 6 years. Purposive selection method was taken for allotment the subjects. The responses of the subjects are measured and tabulated by standardized tests. The analysis of variance was used in the present study. The purpose of the study was to find out the causal relationship between the time duration of marijuana abuse and memory capacity and the results indicates that there was the significant differences at .0 level.*

Key Words: Memory, drug, drug abuse, marijuana, Purposive selection method, allotment, tabulated.

Drugs are substances that change a person's mental or physical state. They can affect the way your brain works, how you feel and behave, your understanding and your senses. This makes them unpredictable and dangerous, especially for young people. The effects of drugs are different for each person and drug.

Drugs can also be defined as chemical substance used in the treatment, cure, prevention, or diagnosis of disease or used to otherwise enhance physical or mental well-being or as a substance used to prevent or cure a disease or ailment or to alleviate its symptoms.

Addiction is defined as a chronic, relapsing disorder characterized by compulsive drug seeking, continued use despite harmful consequences, and long-lasting changes in the brain. The initial decision to take drugs is generally voluntary. However, with continued use, a person's ability to exert self-control can become seriously impaired. Brain imaging studies from people addicted to drugs show physical changes in areas of the brain that are critical for judgment, decision-making, learning, memory, and behavior control. Scientists believe that these changes alter the way the brain works and may help explain the compulsive and destructive behaviors of a person who becomes addicted.

Marijuana is a drug made from the buds and leaves of the cannabis plant. Marijuana also goes by the names pot, weed, grass, and ganja. People consume marijuana in order to alter their state of consciousness or achieve a state of relaxation. This experience is called a high, and it can be achieved through many different means, including smoking, vaporizing, or eating food with marijuana cooked in as an ingredient. Because marijuana may help treat chronic pain and other conditions, the drug is also consumed for medicinal purposes.¹

When studying the effects of cannabis on memory function, it is important to be mindful that human memory is not a unitary measurable concept. Rather, it is a construct that considers multiple subsystems with different specializations and processes being involved - all of which are localized in overlapping but different brain regions. In light of the complexities in the assessment of memory function, some of the inconsistencies in results across studies may be related to the different memory paradigms that have been used in so many studies, which may have investigated related but not completely overlapping aspects of memory and employed tasks with differing levels of complexity.

Cannabis contains varying amounts of the potentially therapeutic compound cannabidiol which may help quell anxiety. However, there's no question that marijuana (the dried flowers and leaves of the cannabis plant) can produce short-term problems with thinking, working memory, executive function, and psychomotor function (physical actions that require conscious thought, such as driving a car or playing a musical instrument). This is because marijuana's main psychoactive chemical, THC, causes its effect by attaching to receptors in brain regions that are



vital for memory formation, including the hippocampus, amygdala, and cerebral cortex.²

Literature review- Those who start using marijuana at a young age may be at greater risk for long-term effects on thinking and memory. This is because it affects the region of the brain responsible for executive functioning, which develops last. Executive functioning refers to the processes that have to do with decision making, problem-solving, planning, and memory.³

One study showed that teenagers who started smoking between ages 14 and 22 - but who stopped at 22 - had significantly more cognitive difficulties than those who didn't⁴. Another study found that adults who had started smoking marijuana before they were 17 showed significant impairments in verbal fluency, memory, and abstract reasoning.⁵

According to Meak & et. al (1989) drug addicts had poor memory and cognitive abilities and their memory and reasoning abilities were also weak.

According to Hott & et. al (1989) reaction times of addicts were found to be slower and gender discriminations were also found to the retrieval task. Women had slower memory times than men.

Problem- What is the effect of marijuana addiction on memory?

Hypothesis- There is the effect of time duration of marijuana abuse on memory.

Research design- The independent variables are taken through the process of purposive selection while the external variables are taken through the process of formation of the same group. How long drug addictions have been around, this transit was also determined by purposive selection. In the present research, three levels were used by taking substances which were 2 years, 4 years and 6 years. 30 participants are in each group. Dependent variable is the response given by the subjects. The responses of the subjects are measured and tabulated by standardized tests. The analysis of variance was used in the present study. For the compilation of data, the psychiatry center and drug eradication center of Delhi, Lucknow, Varanasi and Faizabad were contacted. PGIMS () Used to measure the Subject's Memory. This memory scale has 10 subsets and was created by Dwarika Prasad & N.N. Vig ,psychiatry department, Chandigarh.

Statistical analysis- PGI Memory scale was given to the subjects which has 10 subsets. When subjects filled the scale, statistical analysis was performed by finding F values(mentioned below).

Table no 1

Subsets of PGI Memory Scale	F- values		
	Marijuana addicted subjects (N=90)		
	2 years n=30	4 years n=30	6 years n=30
Remote memory	9.53**	82.49**	182.89**
Recent memory	30.53**	50.51**	116.69**
Mental balance	39.21**	68.22**	217.35**
Attention and concentration	258.63**	586.76**	983.37**
Delayed recall	110.34**	182.57**	459.5**
Immediate recall	65.30**	137.85**	472.16**
Verbal retention for similar pairs	6.44**	27.26**	346.32**
Verbal retention for dissimilar pairs	386.64**	310.47**	545.23**
Visual retention	76.31**	163.95**	236.86**
Recognition	90.55**	302.93**	534.12**

**p<.01
Findings-



One way ANOVA was used to study the effect of time duration of marijuana intake on memory. From the analysis of Table No. 1, it is known that significant difference ($F=29.86$) was found in all three groups on the remote memory time scale. The 2 years old Marijuana addicted group scored more than the 4 years old and 6 years Marijuana Addicted group. 4 years marijuana addicted group scored less than 2 years old group and more than 6 years old addicted group.

Significant difference was found in all groups on the recent memory subscale. The 2-years marijuana addicted group scored higher than the 4-years and 6-years Marijuana addicted group. The 4 years old Marijuana addicted group scored less than the 2 years old group and higher than the 6 years old group.

The 2-years-old group scored the highest on the mental balance sub-scale, while the 6-years-old group scored the lowest. The 4-years-old marijuana addicted group scored less than 2 years and less than 6 years. Analysis of Table No.1 explains the significant difference among three groups.

The analysis of table number 1 shows that there is a significant difference between the three groups on all the scales of attention and concentration. From this it is concluded that the group of marijuana addicts has the highest score compared to other groups from 2 years. The 4-years-old marijuana addicted group scored less than the 2-years-old group and the 6-years-old Marijuana addicted on this subscale.

There was a significant difference between the 4 years and 6 years of the marijuana addicted group on the delayed recall memory subscale.

Significant difference was found in Marijuana addicted group at 2 years, 4 years and 6 years on the immediate recall memory subscale. The 2 year old marijuana addicted group had higher scores than the other two groups. The Marijuana addicted group scored less than 2 years and more than 6 years on this subscale for 4 years.

From the table 1, it is known that 2 year old Marijuana addicted group got the highest marks and 6 years old Marijuana addicted group got the lowest marks. Significant difference between 2 years, 4 years and 6 years old Marijuana addicted group found on the verbal retention subscale of identical/similar pairs. The group engaged in marijuana addiction for 4 years scored less than the group engaged in 2 years and higher than the group engaged in marijuana addicted for 6 years.

The group that engaged in Marijuana addicted for two years scored higher than the group addicted to Marijuana for 4 years and 6 years. Significant differences were found in the scores of verbal retention of dissimilar pairs of all three groups. The lowest score was in the marijuana addicted group at 6 years and the highest score at 2 years. The group addicted to marijuana for 4 years scored less than the addicted group at 2 years and higher than the addicted group at 6 years.

The 2-years Marijuana addicted group scored the highest and the 6-years Marijuana group scored the lowest on the visual retention subscale of memory. Significant difference between 2 years, 4 years and 6 years in Marijuana addicted group was found on this subscale. The group engaged in marijuana addicts for 4 years scored less than 2 years and more than 6 years.

A significant difference was found between the three groups on inspecting the table number 1 for the recognition subscale of memory. The group engaged in marijuana addicted for 2 years scored the highest while the group engaged in addicted for 6 years scored the lowest. Addicted group of 4 years scored less than 2 years and above 6 years.

Results- The present study suggests that there are significant differences between Marijuana addicted groups on almost all subscales of the memory scale. On the basis of this study, we can conclude that as marijuana abuse progressed, the memory capacity gradually decreased.

Arsche and colleagues (1999) also postulated that a chronic drug addict damages the parts of the brain that are concerned with the activities of memory.



Limitations- The number of subjects in the subgroups was less. In the study, only those who engaged in marijuana abuse were considered. The study focused only on people aged 21 to 50, but did not include young adolescents.

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