

Comparative Study of the effect of time duration of marijuana and heroin abuse on concept formation

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Abstract

The present study was conducted to assess the effect of time duration of heroin and marijuana abuse on concept formation in a comparative manner which based on a sample of 90 people from three different groups. This group represents the involvement of heroin and 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 along with the difference between the time duration of heroin and marijuana abuse on concept formation and the results indicates that there was significant difference at 0.01level.

Keywords-Concept-formation, Drug, Drug abuse, Heroin, Marijuana.

Introduction

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)

Heroin, also known as diacetylmorphine and diamorphine, is synthesized from a combination of the opium poppy and morphine. This makes heroin an opiate; like any opiate, it targets the naturally occurring opioid receptors in the brain. (3)

The immediate effect of a powerful drug like heroin binding to those molecules is a surge of euphoria and pleasure, giving way to a feeling of supreme tranquility that can last for hours. Studies explain that during rhythmic physical activity, the body naturally releases chemicals called *endorphins*, which bind to the opioid receptors to produce similar sensations of pleasure and nullify the feeling of pain.(4)

Prescription opioid pain medications such as Oxycontin and Vicodin can have effects similar to heroin when taken in doses or in ways other than prescribed. Research now suggests that abuse of these drugs may open the door to heroin abuse.(4)

Concepts are the categorization of objects, events, or people that share common properties. By using concepts, we are able to organize complex notions into simpler and therefore more easily usable forms. Concept formation is the process by which we learn to form classes of things, event, people, and so forth. **Concept formation** is a process by which a person learns to sort specific experiences into general rules or classes. The term *concept formation* describes how a person learns to form classes.

Literature review-

Impairments of human cognition and learning following chronic marijuana use are of serious concern, To determine whether such impairments occurred, this study compared performance of adult marijuana users and non-users ($N=144$ and $N=72$, respectively) matched on intellectual functioning before the onset of drug use, The retrieval impairments were restricted to words that were easy to visualize. Impairments depended on the frequency of chronic marijuana use, i.e., “light” and “intermediate” marijuana use (defined by use one to four and five to six times weekly, respectively) were not associated with deficits. Intermediate use was associated with superior performance in one condition (“fuzzy” concepts) of a Concept Formation test. (5)

Another studies explained that Heroin abuse can lead to organic damage of cerebral structures, including sequels in cognitive and affective sphere, which are in positive relation

with the duration of substance usage. Memory is one of the cognitive functions which is highly sensitive to opiate toxic effects. Heroin abuse leads to damage of delayed visual memory, whereby for the observed effect intake of the substance for a period longer than one year is necessary. (6)

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.(7)

Problem-

- What is the effect of different time duration of heroin addiction on concept formation?
- What is the effect of different time duration of marijuana addiction on concept formation?
- What is the difference between time duration of heroin and marijuana addiction on concept formation?

Hypothesis-

- There is the effect of different time duration of heroin addiction on concept formation.
- There is the effect of different time duration of marijuana addiction on concept formation.
- There is a difference between time duration of heroin and marijuana addiction on concept formation.

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. Kansanian Hoffman’s concept formation test was used for assessing the ability of concept formation.

Statistical analysis-

Kansanian Hoffman’s concept formation test 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

Summary of ANOVA of the effect of time duration of heroin abuse on concept formation

Concept formation	F- values
	Heroin addicted subjects (N=30)
Number of trials	146.36
Total time	301.09
Number of errors	251.09

**p<.01

Table no -2

Summary of ANOVA of the effect of time duration of marijuana abuse on concept formation

Concept formation	F- values
	Marijuana addicted subjects (N=30)
Number of trials	120.76
Total time	109.05
Number of errors	219.03

**p<.01

Summary of ANOVA between two years heroin and two years marijuana addicted groups (TABLE- 3)									
Numbers of Trials					Reaction time				
Source of variance	Sum of squares	df	Mean square	F	Source of variance	Sum of squares	df	Mean square	F
Between groups	0.15	1	0.15	0.22*	Between groups	22.77	1	22.77	6.51*
Within groups	38.83	58	0.67		Within groups	203.04	58	3.5	
total	38.98	59			total	225.72	59		

Summary of ANOVA between four years heroin and four years marijuana addicted groups (TABLE-4)									
Numbers of Trials					Reaction time				
Source of variance	Sum of squares	df	Mean square	F	Source of variance	Sum of squares	df	Mean square	F
Between groups	0.82	1	0.82	0.99*	Between groups	167.87	1	167.87	18.19*
Within groups	48.03	58	0.83		Within groups	535.02	58	9.23	
total	48.85	59			total	702.89	59		

Summary of ANOVA between six years heroin and six years marijuana addicted groups (TABLE-5)									
Numbers of Trials					Reaction time				
Source of variance	Sum of squares	df	Mean square	F	Source of variance	Sum of squares	df	Mean square	F
Between groups	1.67	1	1.67	2.23*	Between groups	110.62	1	110.62	6.69*
Within groups	43.33	58	.75		Within groups	959.17	58	16.54	
total	45.0	59			total	1069.79	59		

*p<.05

Findings and results-

One way ANOVA was used to study the effect of time duration of heroin intake on concept formation. From the analysis of Table No. 1, it is known that significant difference ($F=146.36, **F_{0.01}(1.87)=6.96$) was found in all three groups.

From table no-1, it is known that two years Heroin addicted groups completed the task related to concept formation in the least time. Six years old group had to make the most effort. Four years old group tried more than two year old group and less than six years old addicted group. Six years old heroin addicted group scored the highest marks while two years old heroin addicted group scored the lowest whereas four years old heroin addicted group scored more than two years old heroin addicted group and six years old heroin addicted group took so much time.

Inspection of Table No-1 reveals that there is a significant difference ($F=251.09, **F_{0.01}(1.87)=6.96$) among two years, four years and six years old heroin addicted groups. The six years old heroin addicted group made the most mistakes compared to the other groups. Four years old heroin addicted group committed more errors than two years old heroin addicted group and committed less errors than six years old heroin addicted group.

From table no-2, it is known that two years marijuana addicted groups completed the task related to concept formation in the least time. Six years old group had to make the most effort. Four years old group tried more than two years old group and less than six years old marijuana addicted group. Six years old marijuana addicted group scored the highest marks while two years old marijuana addicted group scored the lowest whereas four years old marijuana addicted group scored more than two years old marijuana addicted group and six years old marijuana addicted group took so much time.

Inspection of Table No-2 reveals that there is a significant difference ($F=146.36, **F_{0.01}(1.87)=6.96$) among two years, four years and six years old marijuana addicted groups. The six years old marijuana addicted group made the most mistakes compared to the other groups. Four years old marijuana addicted group committed more errors than two years old marijuana addicted group and committed less errors than six years old marijuana addicted group.

Table no-3 shows comparative analysis between two years old heroin addicted group and two years old marijuana addicted group. According to this table, the nature of drug addiction affects the formation of concepts. Similar efforts made by both of the different drug addicted groups in concept formation. In regards with this, there is no significant difference ($F=0.22, **F_{0.01}(1.58)=7.08$) between two years old heroin addicted group and two years old marijuana addicted group.

The second section from this table indicates a significant difference between two years old heroin addicted group and two years old marijuana addicted group at 0.05 level. Two years old heroin addicted group took less time in comparison to the another (marijuana) group. Reaction time indicates how much time the subjects take in decision making or in responding.

Table no-4 shows comparative analysis between four years old heroin addicted group and four years old marijuana addicted group. Almost similar efforts made by both of the different drug addicted groups in concept formation. In regards with this, there is no significant

difference ($F=0.99$, $**F_{0.01}(1.58)=7.08$) between four years old heroin addicted group and four years old marijuana addicted group.

The second section from this table indicates a significant difference ($F=18.19$, $**F_{0.01}(1.58)=7.08$) between four years old heroin addicted group and four years old marijuana addicted group at 0.05 level. Four years old marijuana addicted group took more time in comparison to another (heroin) group. This group takes so much time in organizing units.

Table no-5 shows comparative analysis between six years old heroin addicted group and six years old marijuana addicted group. Almost similar efforts made by both of the different drug addicted groups in concept formation. In regards with this, there is no significant difference ($F=2.23$, $**F_{0.01}(1.58)=7.08$) between six years old heroin addicted group and six years old marijuana addicted group. Both groups could not complete the task of concept formation in stipulated number of attempts.

The second section from this table indicates a significant difference ($F=6.69$, $**F_{0.01}(1.58)=7.08$) between six years old heroin addicted group and six years old marijuana addicted group at 0.05 level. Six years old heroin addicted group took less time in comparison to another (marijuana) group. This group takes so much time in organizing units.

Limitations-

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

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