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Socio-demographic correlates on acute and chronic effect of cannabis on human cognition: A comparative outcome study

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ABSTRACT

The current study aim was to examine the socio-demographic correlates on the acute and chronic effect of cannabis on human cognition. Methods: Based on purposive sampling method a group of 30 male acute cannabis patients and similarly 30 chronic cannabis patient selected. Results: Cut off points for all demographic correlates and cognitive dysfunction on human cognition Scores was significantly high as compared to acute cannabis group and its cognitive dimension (p<.001).

Keywords: *Cannabis, Human cognition, Impairment*

1. INTRODUCTION

Cognition is the complex higher neurological function. Cognitive process includes abstraction, perception, higher level thinking, problem solving and to executive functions. Cognition is a word that came in beginning of 15th century. The word comes from the Latin word "cognoscere" which means accusation of information that have acquired through learning or experience. After formation of cognitive concepts it has been found that cannabis have extreme manifestation on human cognation.

There are few processes which come under the domain of cognition. Attention is a process that enables an individual to focus on the relevant information in a stimulus away while also inhibition further processing of non-relevant information (Rothboart, Posher & Hershey 1995). Attention is a prerequisite for the successful performance of more complex cognitive process, perception is a central step in the processing of sensory information perceived through sensory systems is later transformed into higher order codes for use by the various higher order cognitive subsystems. Perceptual functions include activities such as awareness, recognition, discrimination, and orientation (Lezak 1995).

Executive functioning, this term has encompassed number of meanings. Definitions have included those controls and regulatory processes that:

(i) Integrate information perceived in the external world and transform perception into higher order symbols.
(ii) Compare incoming information with what knowledge stored in memory and
(iii) Combine those incoming perceptions with information about the person's internal physiological state and biological drives. Executive functioning is the most complex aspect of one's cognitive capacities, due to variety of functions required to select, plan, organize and implement a behavioural response appropriate to a constantly changing world.

1.1. Effect of Cannabis on Human Cognition:-Cannabis is easily available from cannabis plant. Its accessibility is also trouble-free for intake and use. Cannabis is also known as "marijuana, grass, pot, dope, Mary Jane, hooch, weed, hash, joints, brew, reefers, cones, smoke, mull, Buddha, hydro, yarndi, heads and green". Cannabis major active component is called delta-9 tetra hydro cannabin (THC

Cannabis is being used mainly in three forms. "Marijuana, hashish and hash oil". Marijuana is prepared from dried flowers and leaves of the cannabis plant. This type of cannabis form is the slightest powerful of all the cannabis products and is usually smoked or made into edible products like cookies or brownies. Hashish is made from a secreted gum of the cannabis plant. It is dried and pressed into small blocks and smoked. It can also be added to food and eaten. Hash oil the most potent cannabis product, is thick oil obtained from hashish. It is also smoked.

1.2. Short-Term Effects of Cannabis:-Short term effects indicates a change in universal temperament , along with happiness, talkativeness and feeling and in physical experience and increased confidence, paranormal judgment, deformed perception, space and self-image or Sensory changes, marked by increased sensory perceptions, colours at times seem more intense and stronger physical change.

2. REVIEW OF LITERATURE

National Institute on Drug Abuse, (NIDA), 2016, conducted longitudinal study on acute and chronic cannabis and found that young people are most at risk for marijuana intake/abuse (NIDA, 2016).

Somatic Effects: - Just about ten minutes after use, cardiac output, heart rate, and cerebral blood flow increase. Accelerated heart rate increases of 20% to 50% compared to usual rhythm and could help trigger anxiety and panic attacks in some users. Manifestation can be palpitations, reduced tolerance in subjects, heart problems in subjects who are at risk or are predisposed. A current study suggests that the threat of myocardial infarction increases by 4.8 times in the first hour after using marijuana and is 1.7 times higher in the second use.

Psychomotor Effects:- It can effect negatively on remembering words, pictures, stories and sounds; instability in psychomotor performance, including diminished ability to pay attention and concentrate, diminished reflexes, delayed reaction time, trouble with coordination of actions and impaired ability to perform complex tasks.

The cognitive effects: - In acute and chronic phase of cannabis intake cognitive impairment may extend for 24 hours. Patient will always get inclination to have cannabis. At high doses inexperienced users, cannabis may cause a certain number of negative reactions that can even include a genuine paranoid, hallucinatory, manic or hippomanic psychotic experience.

Long-Term Effects of Cannabis:-There is inadequate research on the long-term effects of cannabis. On the available confirmation the main probable adverse effects on memory and learning difficulty, especially in spoken memory, and continued to have difficulty for up to two weeks after abstinence, users appeared normal and no different than non-users within one month. In other words, short-term memory and learning impairment can become chronic.

Samantha J. Boyd ET. Al, 2016, they conducted empirical research in the past decade (from January 2004 to February 2015) on acute and chronic effects of cannabis on human cognition. They concluded that verbal learning, memory and attention are most consistently impaired by intake of cannabis. It was also observed that psychomotor function the patients were affected during acute intoxication.
Bertha K. Madras,et. al, 2015, carry out study 'cannabis endocannabinoids" and found that endocannabinoids and their receptors play a basic role in regulating pleasure, memory, thinking, concentration, body movement, awareness of time, appetite, pain, sensory processing and brain development.

Christophe et.al, 2004,conducted study on "cannabis use and its related dose" after intensive observation they found that dose of cannabis closely related to personality change, and pre-existing vulnerability are among the main factors related to acute psychiatric disorders derived from cannabis use. Its use significantly increases the risk of developing psychotic illnesses. Acute cannabis use nearly doubles the risk of a collision resulting in serious injury or death. Evidence indicates that frequent and prolonged use of cannabis can be harmful to both mental and physical health. Chronic effects of cannabis use include mood disorders, neuron cognitive impairments and somatic disorders.

According to the Ministry of Social Welfare, Government of India, there were 8, 11, 592 drug addicts till December 2005 in India. The statistics was confirmed to those who had registered themselves with some clinics or 37 de-addiction centres. The unreported cases would be many times the recorded figures. There were 1, 00, 00 heroin addicts in India and 15,000 were being added each year, as reported by Saksena in 1996 in the Times of India. About 87.6 % of drug addicts in India, according to Rebello (1988) were between the ages of 14 and 25 years. There existed 7, 00, 000 drug addicts and about 30 of them died daily, unsung, uncared and unheard. The most widely abused drug in India according to Lather (1993) was hallucinogens, i.e. marijuana group of drugs like bhang, ganja, hashish and charas. Marijuana in the form of bhang has been part of ancient society. 'Smack' or brown sugar was the most harmful drug abused in India the frequency of addicts among Bangalore University students alone was reported as high as 15% out of an estimated 50,000.

Drug abuse studies conducted at the PGI Chandigarh found that Chandigarh and Bhatinda had de-addiction centres where over 5,000 addicts were registered during 1993-94. They included over 2,000 poppy husk addicts and another over 1,000 opium addicts. Unfortunately, the number of addicts from the poorer section of society was found to be three times as compared to those from the upper strata of society.

A study made by Prashant (1993) on a large number of drug abusers at a Delhi de-addiction centre showed that drugs which were abused were heroin, morphine, codeine preparations, diazepam, nitrosun, ganja/charas, opium, bhang, amphetamines, barbiturates. There was usually a lot of multiple drug use very high percentage of addicts said that drugs were available easily.

W.H.0. Expert Committee (1975) made several studies in India regarding drug addiction and reported the following important reasons for addiction:-

i. Underlie character disorder in which immediate gratification was sought at the expense of long term adverse consequences and at the price of immediate surrender of adult responsibilities.
ii. Manifestation of delinquent (deviant) behaviour in which there was pursuit of personal pleasure in regard to social connection.
iii. Attempts at self-treatment by persons who suffered from either psychic or physical distress or who strongly believed that it had powers to prevent disease or increase sexual capacity.
iv. A way of getting social acceptance especially for the socially deprived inadequate individual. According to Emrich (1992), research in the U.S. has at least tentatively identified a number of factors which correlate with cannabis abuse. These included parental use of alcohol, lack of closeness to parents, high level of peer group involvement, unemployed father and one or both parents missing. The absence of any carefully organized meaningful employment programmes for adolescents, according to him, negatively affected self-esteem of young people, led to close peer attachments, and fostered open rebellion towards the adult world with regard to the causative factors of drug abuse.

Blum and associates (1969) studied the family structure and found that drug using students came from families that put little emphasis on child-rearing practices and structured intra-family relationships. Family influences out-weighed those presented by peers, religion and school as the major determinant of drug abuse.

Wilson (1968) found that the mothers in the family of drug dependents could be characterized as excessively controlling and strict or excessively indulgent and non-disciplinary. The fathers played a minimal role in the patient's living, either by being absent through desertion, separation or divorce or through dis-interest, or were actively punitive and moralistic or were paranoid and controlling in relating to both the mother and the patient The relationship between the parents were generally poor. Either the father played a domineering, controlling role in the family or the father was a weak and ineffectual figure.

3. OBJECTIVES OF THE STUDY

- To describe effect of cannabis on human cognation.
- To determine the degree of cognitive dysfunction on both experimental group.
- To compare the performance of cognitive ability in both experimental groups.

3.1. Hypothesis

- There will be no significant difference between acute and chronic cannabis on human cognition.
- There will be no significant relationship between acute and chronic cannabis on human cognition.

4. METHODOLOGY

4.1. SAMPLE

Based on purposive sampling method a group of 30 acute cannabis Male/Female subjects and 30 chronic cannabis Male/Female subjects selected between the age ranges of 18 to 40 years. The all have been identified/selected Private/Government De-addiction Canter.

4.2. Inclusion Criteria:

- Subject diagnosed according to ICD – 10.
- Male/Female Patient.
- Right -Handed.
- Subject age range 18 to 40 years.
- Educated up to 12 yrs education
- Subject supportive for assessment.

4.3. Exclusion Criteria:

- Poor eye sight or hearing impairment.
- Patients who are not able to supportive

4.4 Assessment tools for

- Socio – demographic and clinical data sheet
- Handedness preference schedule (Manual et al 1992)
- PGI –BBD (Brain battery dysfunction) Pershad and Verma (1990).

Socio – demographic and clinical data sheet: - A self-formulated clinical data sheet will be used to get primary data information as well secondary. It includes subject's age, education, and marital status vacation/job for information about the subjects.

Handedness preference schedule:-To decide the handedness preference of the patient Hindi version of handedness preference schedule was used. It has items mainly based as culturally acquainted hand activities. The test consists of 15 items consisting 5 point scale. Subjects are supposed to give as responses as mentioned -Answer are asked to specify their hand preferences.

5. RESULT and DISCUSSION

Table 1 shows the Socio – Demographic Profile of (n=30) Acute Cannabis Group (ACG) and (n=30) Chronic Cannabis Group (CCG)

Table 1: Socio-demographic characteristics of study sample (Age)

Variable	Acute Cannabis Group (ACG)	Chronic Cannabis Group (CCG)	χ^2 / F	df	Level of significance
Age	23.63±4.06	22.93±5.29	26.07	-	NS

*P < 0.05, ** P < 0.01, *** P < 0.001

It is clear from Table 1 which gives descriptive information about the socio-demographic characteristics of entire sample, which was divided into two groups – acute cannabis addicted and chronic cannabis.

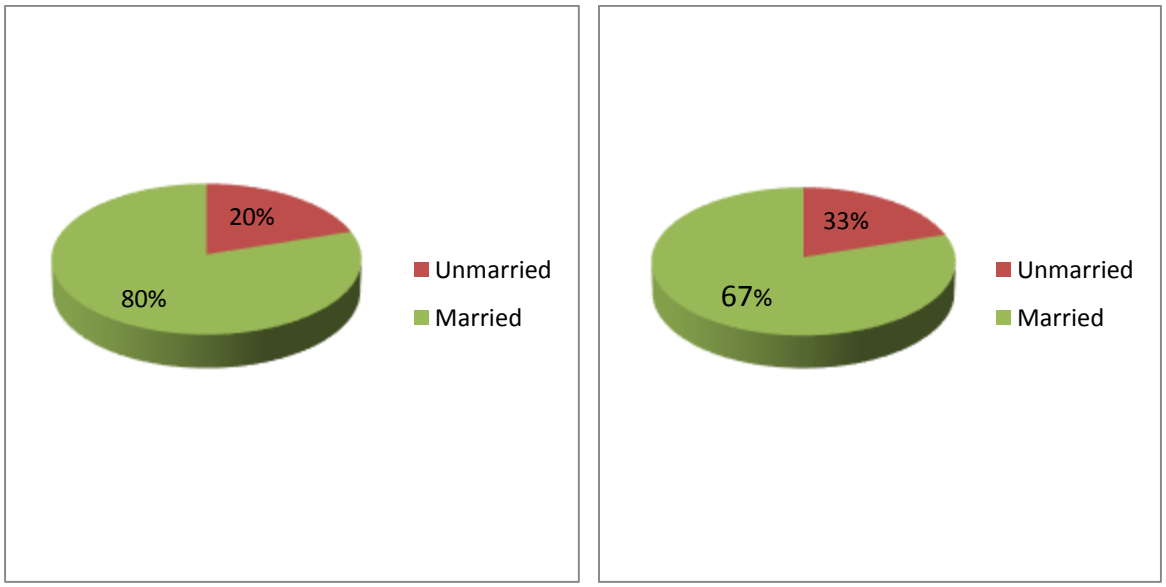
The mean age of acute cannabis addicted and chronic cannabis were 23.63±4.06 and 22.93±5.29 respectively. It is clear from the table that there is no significant difference among two groups, regarding their age

Table 2 shows Socio – Demographic Profile of (30) Acute Cannabis Group (ACG) and (30) Chronic Cannabis Group (CCG).

Table 2: Socio-demographic characteristics of study sample (Marital status)

Variable		Acute Cannabis Group (ACG)	Chronic Cannabis Group (CCG)
Marital Status	Unmarried	6(20)	10(33)
	Married	24(80)	20(67)

Marital status of the subjects has been taken into account. It has been observed that 80% Acute Cannabis Group (ACG) were married, 20% of the patients were unmarried. Respectively 33% of the Chronic Cannabis Group (CCG) was unmarried and 67 % of patients were married.

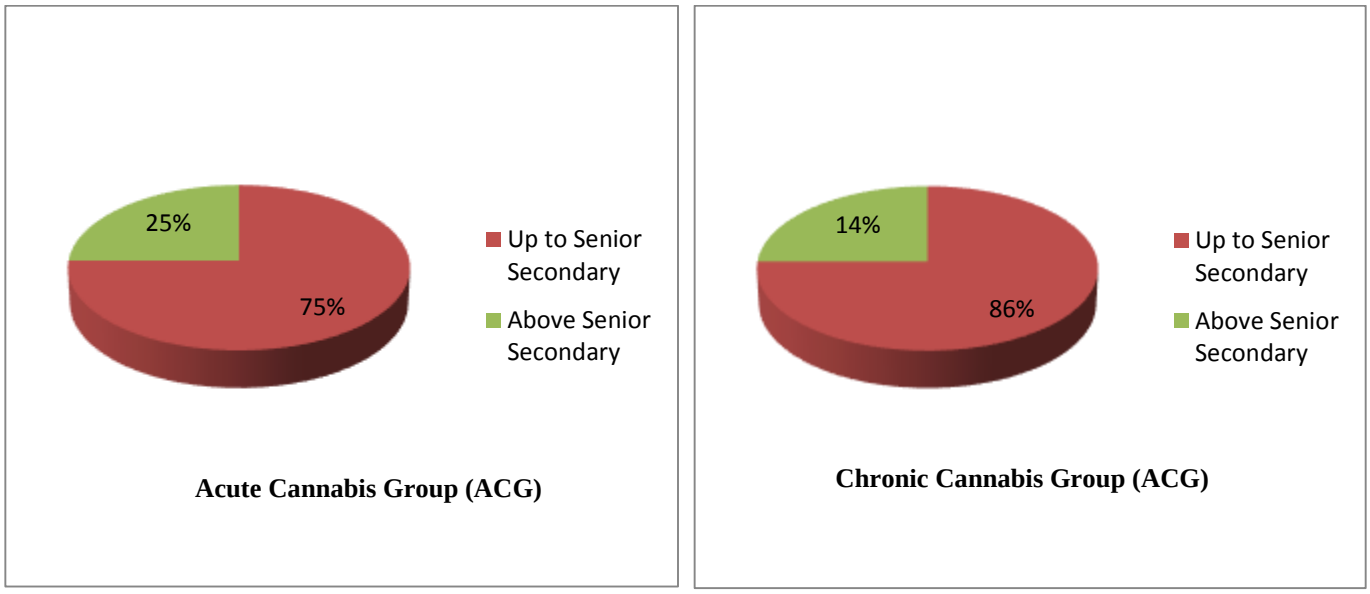


Graph 1: Socio-demographic characteristics of study sample (Marital status)

Table 3: Socio-demographic characteristics of study sample education.

Variable		Acute Cannabis Group (ACG)	Chronic Cannabis Group (CCG)
Education	Up to Senior Secondary	25(75)	26(86)
	Above Senior Secondary	5(25)	4(14)

When education of the subjects have been taken into consideration. It has been observed that in early onset schizophrenic 75% of patients were educated up to higher secondary level 25 percent patients were educated up to higher secondary level In the group of frontal lobe impaired 86% of the patients were educated up to higher secondary level rest 14% educated up to above than higher secondary level.

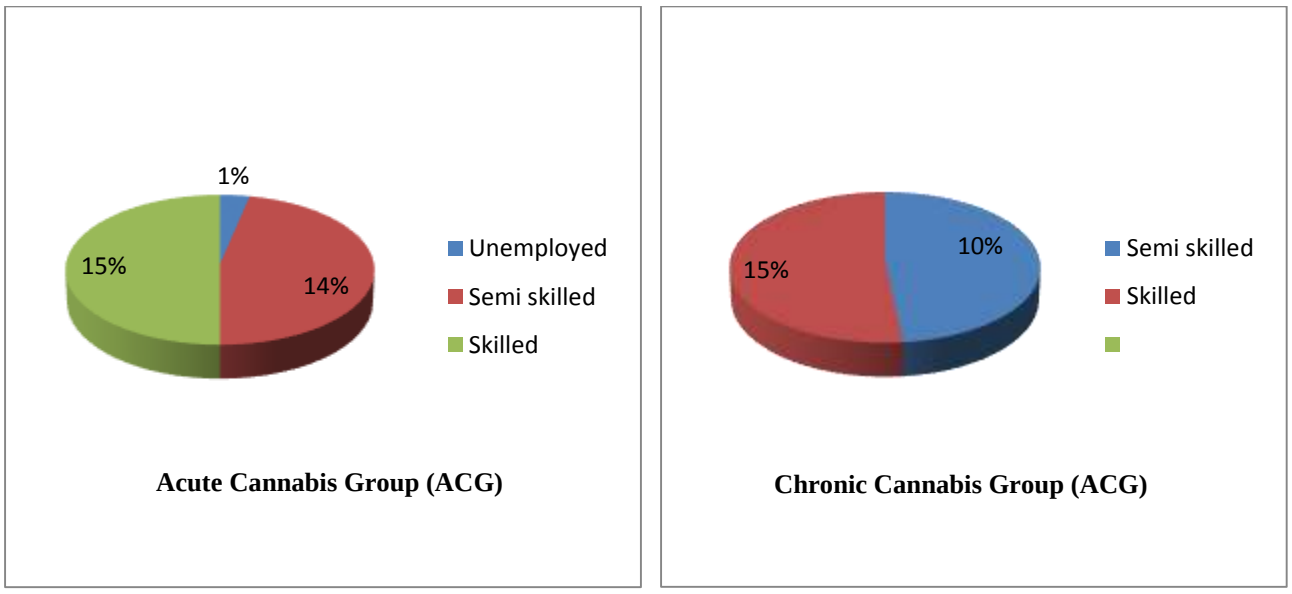


Graph 2 Socio-demographic characteristics of study sample education

Table 4 shows Socio-Demographic Profile of (30) Acute Cannabis Group (ACG) and (30) Chronic Cannabis Group (CCG) Education.

Table 4: Socio-demographic characteristics of study sample Occupation

Variable		Acute Cannabis Group (ACG)	Chronic Cannabis Group (CCG)
Occupation	Unemployed	01(3)	10(34)
	Semi-skilled	15(50)	15(50)
	Skilled	14(47)	05(16)



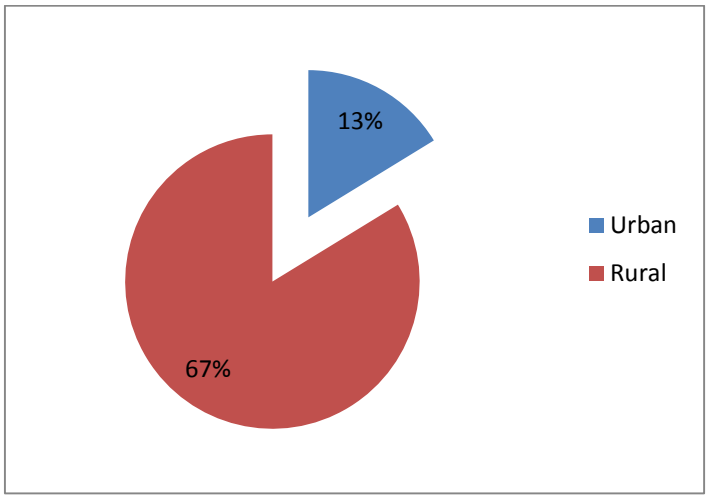
Graph 3: Socio-demographic characteristics of study sample education

Table 5 shows Socio – Demographic Profile of (30) Acute Cannabis Group (ACG) and (30) Chronic Cannabis Group (CCG).

Table 5: Socio-demographic characteristics of study sample Domicile

Variable		Acute Cannabis Group (ACG)	Chronic Cannabis Group (CCG)
Domicile	Rural	11(37)	09(30)
	Urban	19(63)	21(70)

When domicile of the patients have been taken into consideration it has been observed that 63% of the patients were urban group rest 37% rural background in ACG. In the group of CCG 70% of the patients were belonging to urban area and 30% of patient was from rural area.



Graph 4: Socio-demographic characteristics of study sample domicile

6. CONCLUSION

Cut off points for all demographic correlates and cognitive dysfunction on human cognition Scores was significantly high as compared to acute cannabis group and its cognitive dimension ($p<.001$).

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