

Social Cognition in Persons with Alcohol Dependence Syndrome (ADS)

Joysree Buragohain*, Dr. Dipesh Bhagabati**

*Research Scholar, Department of Psychology, Gauhati University, India

**Professor (Retd), Department of Psychiatry, Gauhati Medical College and Hospital (GMCH)

Abstract

Background:

Social cognition is one of the important cognitive areas for a human being but it has been observed that there is a fraction of people in the society with deficient social cognition. Although review of literature suggest that Alcohol Dependence Syndrome is clearly associated with social cognition impairment, yet there are limited research work supporting it in India.

Aim:

The aim of the study is to assess social cognition in persons with Alcohol Dependence Syndrome (ADS).

Method:

Twenty five persons with ADS and twenty five age, sex and education matched normal controls participated in the study. All persons with ADS selected for study were inpatients of the Department of Psychiatry, Gauhati Medical College and Hospital (GMCH), Assam. All participants were administered the Social Cognition Rating Tools in Indian Setting (SOCRATIS) to assess social cognition. The data were analyzed using t test.

Results:

The result findings suggest that the group of persons with ADS was having low score in most of the domain of social cognition as compared to the control group. When both the groups were compared, significant differences were found in the domains of First order theory of mind (FOT) Index, Second order theory of mind (SOT) Index, Faux Pas Composite Index, Alternative (FPCLALT), Externalizing Bias (EB) and Social Perception Index (SPI) of SOCRATIS. However, there was no difference between the clinical and control group in the domain of Personalizing Bias (PB) of SOCRATIS.

Conclusion:

Persons with ADS have significant impairment in theory of mind and also have high externalizing bias as compared to normal controls.

Key words: Alcohol Dependence Syndrome, Social Cognition.

Date of Submission: 24-12-2019

Date of Acceptance: 07-01-2020

I. INTRODUCTION:

Alcohol dependence disorder is a chronic pathological condition characterized by uncontrolled drinking and preoccupation with alcohol. It is the inability to control drinking due to both physical and emotional dependence on alcohol. It is usually self-diagnosable, presenting with repeated alcohol consumption despite related legal and health issues. A chronic alcoholic may begin his day with a drink of alcohol, feel guilty about his habit and may also have the desire to quit this habit. But practically he cannot stop his drinking habit due to his dependency on alcohol. If he tries to decrease or stop drinking then he starts to experience physiological withdrawal state. Alcohol dependence is the most severe stage of alcohol consumption and involves the inability to manage drinking habits and can cause very harmful effects to the individual as well as the society if left untreated. Alcohol dependence is defined as a cluster of behavioural, cognitive, and physiological phenomena that develop after repeated alcohol use and that typically include a strong desire to consume alcohol, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to alcohol use than to other activities and obligations, increased tolerance, and sometimes a physiological withdrawal state. (*Global status report on alcohol and health*, 2014, p.13)

The term cognition is the psychological procedure of knowing, the obtaining, association and utilization of information. Social cognition is one of the important domain of cognition. Social cognition is the manner by which we translate, investigate, recall and use data about the social world, how we consider others, our relations with them and social conditions where we live. Social cognition refers to processes contributing to the perception and understanding of social environments and social interactions (Frith, 2008).

One of the important aspects of social cognition is the Theory of Mind (TOM) which refers to the ability to attribute mental state, beliefs, intents, desires, pretending, knowledge or emotions to oneself and others and to understand that others have beliefs, desires, intentions, and perspectives that are different from one's own (Premack and Woodruff, 1978).

Another important domain of social cognition is social perception. Social psychologists believe that social perception as a focal part of social idea and a significant establishment of social conduct. Social perception is the procedure through which we try to know and comprehend different people.

Attribution is another important aspect of social cognition. Attribution refers to the process through which we try to understand the causes of others' behaviour in the society and after knowing the causes, we can acquire others' stable traits and dispositions.

Alcoholism is associated with a range of cognitive deficits (Uekermann and Daum., 2008). Alcohol dependence or alcoholism is such a condition which can damage a range of higher-level cognitive functions (Parsons, 1998). Alcoholism is also associated clearly with social cognition impairments. Deficits in theory of mind (ToM) are consistently reported in alcoholics (Bosco et al., 2014; Maurage et al., 2011b; Nandrino et al., 2014; Onuoha et al., 2016; Thoma et al., 2013; Uekermann et al., 2007).

Even though alcohol dependence syndrome is widely related to social cognition impairment, there are limited research work in this area in India. So the present study aims to know the extent of social cognition impairment in alcohol dependence syndrome.

II. REVIEW OF LITERATURE:

Bora & Zorlu (2016) in a study titled "Social cognition in Alcohol Use Disorder: A meta analysis" found that Alcohol use disorder appears to be associated with significant impairment in facial emotion recognition and theory of mind.

Onuoha et al (2016) in a study titled "A Meta-analysis of Theory of Mind in Alcohol Use Disorders" suggest that alcohol use disorder may be associated with impaired understanding of others' intentions and emotions, which can leave an individual vulnerable to misinterpreting social cues.

Maurage (2015) in a study titled "Exploring Social Cognition in Alcohol-Dependence: Results from an integrated battery" found that alcohol-dependence is associated with wide-range emotional and interpersonal deficits, particularly for the decoding of negative facial emotions, affective empathy and emotional theory of mind.

Bosco et al.(2014) in a study titled "Theory of mind deficit in subjects with alcohol use disorder: an analysis of mindreading processes" revealed that persons with alcohol use disorder performed worse than controls at all TOM dimensions. In particular persons with alcohol use disorder performed worse at third-person than at first-person ToM, and at the allocentric than at the egocentric perspective. The ability to understand and ascribe mental states is impaired in alcohol use disorder.

Valmas et al. (2014) in a study titled "Social cognition deficits and associations with drinking history in alcoholic men and women" revealed that Alcoholics performed significantly worse than nonalcoholics on the Wechsler Advanced Clinical Solutions (ACS) measures of Affect Naming and Faces Content. Alcoholic men were impaired relative to alcoholic women on Prosody Face Matching and Faces Content scores. Among alcoholics, longer durations of heavy drinking were associated with poorer performance on Affect Naming, and a greater number of daily drinks were associated with lower Prosody Face Matching performance. For alcoholic women, a longer duration of abstinence was associated with better performance on Affect Naming.

Tirassa (2013) in a study titled "Theory of Mind Deficit in Subjects with Alcohol Use Disorder: An Analysis of Mindreading Processes" revealed that the ability to understand and ascribe mental states is impaired in Alcohol Use Disorder.

RATIONALE OF THE STUDY

Social cognition is a vital part of our day to day existence which includes social judgment, attribution, person perception and so on. But it has been observed that persons with Alcohol Dependence Syndrome (ADS) display social cognition deficit. Although review of literature suggest that Alcohol Dependence Syndrome is clearly associated with social cognition impairment, yet there are limited research work supporting it in India. So the present study aims to assess the social cognition in persons with ADS.

RESEARCH QUESTION:

Is there any social cognition deficit in a group of persons with alcohol dependence syndrome?

AIM:

- To study the social cognition in a group of persons with alcohol dependence syndrome and compare the same with a group of persons with no history of alcohol abuse.

OBJECTIVES:

- To assess the social cognition in a group of persons with alcohol dependence syndrome.
- To assess the social cognition in a group of persons with no history of alcohol abuse.
- To compare the social cognition of persons with alcohol dependence syndrome with a matched control group.

HYPOTHESIS:

- There will be no difference in social cognition between persons with alcohol dependence syndrome and persons with no history of alcohol abuse.

SAMPLE SIZE AND SAMPLING TECHNIQUE:

Based on purposive sampling technique, sample consisting of 25 hospitalized persons with alcohol dependence syndrome have been selected from Department of Psychiatry, Gauhati Medical College and Hospital (GMCH) and another matched group consisting of 25 has been taken as the control group.

RESEARCH DESIGN:

It is a cross-sectional descriptive study.

SETTING:

Department of Psychiatry, Gauhati Medical College and Hospital (GMCH), Guwahati.

STUDY SUBJECT:

25 persons with alcohol dependence syndrome admitted in Psychiatry deptt. of GMCH.
25 persons from general population with no history of alcohol abuse.

FOR CLINICAL GROUP:

INCLUSION CRITERIA

- Persons diagnosed with alcohol dependence syndrome as per the diagnosis criteria of ICD-10.
- Age between 21-40 years.
- Minimum education of 10th standard.
- Cooperative patients who give written informed consent.

EXCLUSION CRITERIA

- Past history of any head injury.
- Patients suffering from any neurological disorder including epilepsy.
- History of co-morbid any psychiatric disorder.
- Any chronic debilitating physical illness.
- Person who are in a state of delirium and person who has developed korsakoff's psychosis.

FOR CONTROL GROUP:

INCLUSION CRITERIA

- Persons from general population who do not have any history of alcohol abuse.
- Age range between 21-40 years.
- Minimum education of 10th standard.

EXCLUSION CRITERIA

- First degree relatives of alcohol dependence syndrome.
- Score of more than 2 on 12 item General Health Questionnaire.
- Score of more than 13 on Michigan Alcohol Screening Test.
- Personal history of any psychiatric disorder.
- Patients suffering from any neurological disorder including epilepsy.
- Any chronic debilitating physical illness.

The study was conducted after due clearance from the Ethical Committee.

TOOLS OF DATA COLLECTION:

For the present study following tools were used:

SOCIO DEMOGRAPHIC DATA SHEET:

A semi structured Proforma especially designed for this study is used. It containing information about socio-demographic variables like age, sex, education, occupation, marital status, religion and socio-economic status.

- **ICD-10 diagnostic criteria**
- **GENERAL HEALTH QUESTIONNAIRE-12 (GHQ): (Goldberg and Williams, 1988)**

The GHQ-12 is a self administered screening test which provides a measure of overall psychological health or wellness.

The GHQ-12 focuses on two major classes of phenomena:

- Inability to continue to carry out normal healthy functions.

- Symptoms of a distressing nature.
- GHQ-12 containing twelve items would be used for study.

➤ **MICHIGAN ALCOHOL SCREENING TEST (MAST): (Selzer, Vinokur & Rooijen, 1975)**

The Michigan Alcohol Screening Test was developed in 1971, the MAST is one of the oldest and most accurate alcohol screening tests. This is a screening instrument designed to identify and assess alcohol abuse and dependence. This is a 24-item yes- no questionnaire concerning alcohol-related behaviour. Questions on the MAST test relate to the patient's self-appraisal of social, vocational and family problems frequently associated with heavy drinking. The MAST has been widely used and has been demonstrated to have adequate sensitivity and specificity with a cut-off score of 13 in identifying individuals meeting diagnostic criteria for alcohol abuse and dependence (Dawe and Mattick, 1997).

➤ **KUPPUSWAMY'S SOCIOECONOMIC SCALE : (Kohli, Kishore & Kumar, 2015)**

Kuppuswamy's Socioeconomic Scale is an important tool to assess socio-economic status of families residing in urban areas in India. The three aspects of Kuppuswamy's scale are education, occupation of the head of the family, and total monthly family income.

➤ **SOCIAL COGNITION RATING TOOLS IN INDIAN SETTING (SOCRATIS): (Mehta et al., 2011)**

SOCRATIS is a new test-battery designed to assess social cognition in the Indian culture. This tool consists of four domains of social cognition, viz. theory of mind, emotion processing, social perception & knowledge and attributional bias. This test measures the two sub domain of theory of mind namely first order theory of mind and second order theory of mind. This test also measures two sub domain of attributional style such as externalizing bias and personalizing bias. By administering the tool SOCRATIS, one measures the following domains:

- First Order Theory of Mind (FOT Index)
- Second Order Theory of Mind (SOT Index)
- Faux Pas Composite Index, Alternative FPCLALT
- Externalizing Bias (EB)
- Personalizing Bias (PB)
- Social Perception Index (SPI)

III. PROCEDURE OF DATA COLLECTION:

The data was collected after getting the clearance from the Ethical Committee. Informed consent was taken from both the clinical and control group before eliciting relevant information. The nature and purpose of the study was explained. Firstly in clinical group, after considering all exclusion criteria and who were cooperative, were given the test of Social Cognition Rating Tools in Indian Setting (SOCRATIS). In case of control group respondents were given the Michigan Alcohol Screening Test to screen out alcohol abuse and dependence. Respondents were also given General Health Questionnaire to screen out the psychological well-being and those who scored more than 2 or less than 2 were given the test of Social Cognition Rating Tools in Indian Setting (SOCRATIS).

IV. STATISTICAL ANALYSIS:

Data was coded and entered into a master chart. With the help of "Statistical Package for Social Science" version 18, data was analysed.

Chi square was applied in different variables for socio-demographic profile. Independent t- test was applied to compare the social cognition between clinical and control group.

V. RESULTS:

Table No1: Division of the sample

Variables	N=50
Group 1 (Clinical) Persons with alcohol dependence syndrome	25
Group 2 (Normal control) Persons with no history of alcohol abuse	25

Table 1 showed the sample distribution. The sample comprised of 25 persons with alcohol dependence syndrome and 25 persons with no history of alcohol use and abuse.

Table No.2: Socio-Demographic profile of both clinical group and control group

Variables		Group 1 Clinical N=25	Group 2 Normal Control N=25	df	χ^2	P
Sex	Male	24 (96.0%)	21 (84.0%)	1	2.000	.157
	Female	1 (4.0%)	4 (16.0%)			
Education	HSLC passed	11 (44.0%)	9 (36.0%)	3	.450	.930
	HS passed	7(28.0%)	9 (36.0%)			
	Graduate	6 (24.0%)	6 (24.0%)			
	Post Graduate	1 (40%)	1 (40%)			
	Professional	0	0			
Occupation	Student	0	0	4	3.229	.520
	Unemployed	0	0			
	Unskilled worker	5 (20.0%)	2 (8.0%)			
	Semi-skilled worker	7 (28.0%)	6 (24.0%)			
	Skilled worker	1 (4.0%)	4 (16.0%)			
	Clerical,shop-owner,farmer	7 (28.0%)	8 (32.0%)			
	Semi-professional	5 (20.0%)	5 (20.0%)			
	Professional	0	0			
Marital Status	Married	14 (56.0%)	15 (60.0%)	1	.082	.774
	Unmarried	11 (44.0%)	10 (40.0%)			
	Widow	0	0			
	Divorce	0	0			
Religion	Hindu	23 (92.0%)	23 (92.0%)	1	.000	1.000
	Muslim	2 (8.0%)	2 (8.0%)			
	Christian	0	0			
	Others	0	0			
Family	Nuclear	19 (76.0%)	17 (68.0%)	1	.397	.529
	Joint	6 (24.0%)	8 (32.0%)			
Socio-Economic Status	Upper	0	0	2	8.120	.017
	Upper Middle	5 (20.0%)	5 (20.0%)			
	Lower Middle	6 (24.0%)	15 (60.0%)			
	Upper Lower	14 (56.0%)	5 (20.0%)			
	Lower	0	0			

Table No.2 represents the socio-demographic variables of the clinical group and control group.

In clinical group, 96.0% were male and 4.0% were female. In control group 84.0% were male and 16.0% were female. When chi square was computed statistically significant difference was not found in both the group.

Most of the respondents (56.0%) were married and rest 44.0% were unmarried in the clinical group. The majority (60.0%) of the respondents in this study were married, while the rest 40.0% were unmarried in the control group. When chi square test was applied no significant difference is observed in Marital Status between both the group.

In clinical group, majority (92.0%) of the respondents belonged to Hinduism, only 8.0% followed Islam. In control group, majority (92.0%) of the respondents belonged to Hinduism and the rest 8.0% followed Islam. After computation of chi square no significant difference is observed in Religion between both the group.

In clinical group, most of the respondents (76.0%) belonged to Nuclear family and the rest 24.0% belonged to Joint family. In control group, majority (68.0%) of the respondents belonged to Nuclear family and the rest 32.0% belonged to Joint family. After computation of chi square no significant difference is found in family type between both the group.

The table shows that majority (56.0%) of the respondents belonged to Upper Lower Socio-Economic Status, 24.0% followed Lower Middle Socio-Economic Status and 20.0% followed Upper Middle Socio-Economic Status in clinical group. In control group majority (60.0%) of the respondents belonged to Lower Middle Socio-Economic Status, 20.0% belonged to Upper Middle Socio-Economic Status and the rest 20.0%

belonged to Upper Lower Socio-Economic Status. When chi square was computed significant difference was found at .005 level between both the group.

Table No.3: Age of both clinical and control group

Variable	Group 1 Clinical N=25		Group 2 Normal Control N=25		Df	T	P
	Mean	SD	Mean	SD			
Age	31.68	5.692	30.88	4.902	48	.533	.597

The Table No.3 shows the mean age of clinical group was 31.68 with SD =5.692. In control group the mean age was 30.88 with SD =4.902. After applying t test there is no significant difference between the clinical group and control group.

Table No.4: Social cognition in Clinical group

SOCRATIS	Mean	SD
1.Theory of Mind		
FOT Index	.58	.176
SOT Index	.0964	.13708
FPCLALT	.2710	.18023
2.Attribution Styles		
EB	8.28	2.965
PB	.732	.2512
3.Social Perception		
SPI Index	1.0210	.08149

The Table.4 reveals the social cognition in clinical group. SOCRATIS has three domains. Within Theory of Mind (TOM), FOT Index, SOT Index and FPCLALT were measured. The mean and SD value of FOT Index was found to be .58 and .176 respectively. In the SOT Index of TOM the mean was .0964 with SD = .13708. The mean and SD value of FPCLALT was found to be .2710 and .18023 respectively.

Within attributional style EB and PB were measured. The mean and SD value of EB was found to be 8.28 and 2.965 respectively. In the PB of attributional styles the mean was .732 with SD = .2512.

Within social perception only one sub-domain SPI Index was measured. The mean and SD value was found to be 1.0210 and .08149 respectively.

Table.5 : Social cognition in Control group

SOCRATIS	Mean	SD
1.Theory of Mind		
FOT Index	.95	.161
SOT Index	.7600	.25495
FPCLALT	.5980	.20753
2.Attribution Styles		
EB	.60	5.888
PB	.708	.2886
3.Social Perception		
SPI Index	.9555	.06011

The Table.5 reveals the social cognition in control group. The mean and SD value of FOT Index was found to be .95 and .161 respectively. In the SOT Index of TOM the mean was .7600 with SD =.25495. The mean and SD value of FPCLALT was found to be .5980 and .20753 respectively.

The mean and SD value of EB was found to be .60 and 5.888 respectively. In the PB of attributional styles the mean was .708 with SD = .2886.

In the SPI Index of Social Perception the mean and SD value was found to be .9555 and .06011 respectively.

Table.6: Comparison in Social Cognition between clinical and control group

SOCRATIS	Category	N	Mean	SD	Mean Difference	T	Df	P
1.Theory of Mind								
FOT Index	Clinical	25	.58	.176	.363	7.614	48	.000
	Control	25	.95	.161				
SOT Index	Clinical	25	.0964	.13708	.66360	11.462	48	.000
	Control	25	.7600	.25495				
FPCLALT	Clinical	25	.2710	.18023	.32700	5.948	48	.000
	Control	25	.5980	.20753				
2.Attribution Styles								
EB	Clinical	25	8.28	2.965	-7.680	-5.825	48	.000
	Control	25	.60	5.888				
PB	Clinical	25	.732	.2512	-.0240	-.314	48	.755
	Control	25	.708	.2886				
3.Social Perception								
SPI Index	Clinical	25	1.0210	.08149	-.06552	-3.235	48	.002
	Control	25	.9555	.06011				

The Table No.6 reveals the comparison in social cognition between clinical group and control group.

In the FOT Index of SOCRATIS the mean value was found to be .58 with SD = .176 in clinical group and in control group the mean was .95 with SD = .161. After applying t test significant difference was found at .001 level between both the group.

In the SOT Index of SOCRATIS the mean was .0964 with SD = .13708 in clinical group and in control group the mean was .7600 with SD = .25495. After applying t test significant difference was found at .001 level between both the group.

In the FPCLALT of SOCRATIS the mean was .2710 with SD = .18023 in clinical group and in control group the mean was .5980 with SD = .20753. After applying t test significant difference was found at .001 level between both the group.

In the EB of SOCRATIS the mean was 8.28 with SD = 2.965 in clinical group and in control group the mean was .60 with SD = 5.888. After applying t test significant difference was found at .001 level between both the group.

In the PB of SOCRATIS the mean was .732 with SD = .2512 and in control group the mean was .708 with SD = .2886. After applying t test no significant difference was found between both the group.

In the SPI index of SOCRATIS the mean was 1.0210 with SD = .08149 in clinical group and in control group the mean was .9555 with SD = .06011. After applying t test significant difference was found at .002 level between both the group.

VI. DISCUSSION:

The result findings suggest that the group of persons with ADS was having low score in most of the domain of social cognition as compared to the control group. When both the groups were compared, significant differences were found in the domains of First order theory of mind (FOT) Index, Second order theory of mind (SOT) Index, Faux Pas Composite Index, Alternative (FPCLALT), Externalizing Bias (EB) and Social Perception Index (SPI) of SOCRATIS. However, there was no difference between the clinical and control group in the domain of Personalizing Bias (PB) of SOCRATIS.

VII. CONCLUSION:

Persons with ADS have significant impairment in theory of mind and also have high externalizing bias as compared to normal controls. The study is implied to help the Mental Health Professionals to understand the basic problem in persons with ADS, that is the deficit of social cognition; so that they can help this group of persons with ADS to manage their problems and make a better quality of life by targeting its very root cause, 'the deficit of social cognition.'

REFERENCES:

- [1]. Bora, Emre., & Zorlu, Nabi. (2016). Social Cognition in Alcohol Use Disorder: A meta-analysis. *Addiction*, 112(1).
- [2]. Bosco, M. Francesca., Capozzi, F., Colle, L., Marostica, P., & Tirassa, M.(2014). Theory of mind deficit in subjects with alcohol use disorder: an analysis of mindreading processes. *Alcohol Alcoholism*, 49(3):299-307.
- [3]. Dawe, Sharon., & Mattick, P. Richard. (1997). Review of diagnostic screening instruments for alcohol and other drug use and other psychiatric disorders. Australian Government Publishing Service.
- [4]. Goldberg, D. & Williams, P. (1988). A Users' Guide to the General Health Questionnaire. NFER-NELSON Publishing Co. Ltd. Windsor, Berkshire, UK.
- [5]. Kohli, Charu., Kishore, Jugal., & Kumar, Neeta. (2015). Kuppaswamy's Socioeconomic Scale-Update for July 2015. *International Journal of Preventive, Curative & Community Medicine*, 1(2).
- [6]. Mehta,U.M., Thirthalli, J., Navn, Kumar. C., Mahadeviah, M., Rao, K., Subbakrishna, D.K., Gangadhar, B. N., & Keshavan, M.S. (2011).Validation of Social Cognition Rating tools in Indian Setting (SOCRATIS):A new test battery to assess social cognition. *Asian Journal of Psychiatry*, 4:203-209.
- [7]. Maurage, P. (2015). Exploring Social Cognition in Alcohol-Dependence: Results From an Integrated Battery. *Alcohol and Alcoholism*, 50 (1): i23.
- [8]. Nandrino, J.L., Gandolphe, M.C., Alexandre, C., Kmiecik, E., Yguel, J., & Urso, L. (2014). Cognition and affective theory of mind abilities in alcohol-dependent patients: the role of autobiographical memory. *Drug and Alcohol Dependence*, 143:65-73.
- [9]. Onuoha, c. Roy., Quintana, S. Daniel., Lyvers, Michael., & Adam, J. Guastella. (2016). A Meta-analysis of Theory of Mind in Alcohol Use Disorders. *Alcohol and Alcoholism*, 51 (4):410-415.
- [10]. Parsons, O.A. (1998). Neurocognitive deficits in alcoholics & social drinkers: A Continuum? *Alcoholism Clinical Experimental Research*, 22 (4): 954-961.
- [11]. Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioural and Brain Sciences*, 1 (04), 515-526.
- [12]. Selzer, M.L., Vinokur, A. and van Rooijen, L. (1975). A Self Administered Short Michigan Alcoholism Screening Test (SMAST). *Journal of Studies on Alcohol*, 36, 117-126.
- [13]. Thoma, P., Winter, N., Juckel, G., & Rose, P. (2013). Mental state decoding and mental state reasoning in recently detoxified alcohol-dependent individuals. *Psychiatry Research*, 205:232-240.
- [14]. Tirassa, M. (2014). Theory of Mind Deficit in Subjects with Alcohol Use Disorder: An Analysis of Mindreading Processes. *Alcohol and Alcoholism*, Volume 49, Issue 3, Pages 299-307.
- [15]. Uekermann, J., Channon, S., Winkel, K., Schlebusch, P., & Daum, I. (2007). Theory of mind, humour processing and executive functioning in alcoholism. *Addition*, 102:232-240.
- [16]. Uekermann, J., Daum, I.(2008). Social cognition in alcoholism: a link to prefrontal cortex dysfunction? *Addiction*,103(5):726-35.
- [17]. Valmas, M. Mary., Ruiz, M. Susan., Gansler, A. David., Sawyer, S. Kayle., Oscar-Berman, M.(2014). Social cognition deficits and associations with drinking history in alcoholic men and women. *Alcoholism Clinical Experimental Research*, 38(12):2998-3007.
- [18]. World Health Organization (2014). *Global status report on alcohol and health - 2014 ed.* Retrieved from http://apps.who.int/iris/bitstream/10665/112736/1/9789240692763_eng.pdf

Joyshree Buragohain. "Social Cognition in Persons with Alcohol Dependence Syndrome (ADS)." *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 25(1), 2020, pp. 29-36.