Indian Journal of Psychological Science

Internationally
Indexed, Refereed and Peer Reviewed

Editor
Dr. Roshan Lal
Professor of Psychology
University of Delhi
India-110007

UGC CARE List-II (Web of Science): Emerging Sources Citation Index:

https://mjl.clarivate.com:/search-results?issn=0976-9218

The official organ of:
National Association of Psychological Science (Regd.)

www.napsindia.org **Email:** managingeditorijps@gmail.com, **Phone: 9417882789**

**Nainika Kumari **Dr. Manglesh Kumar Manglam*

Memory Profile of Persons with Alcohol Dependent and Normal Healthy Controls: A Comparative Study

*Nainika Kumari **Dr. Manglesh Kumar Manglam

Abstract:

Background: *Alcohol intake is one the most serious problem in modern society. Memory problem is a common symptom of alcohol dependent patients. Studies differ in findings, though the deficits that have been implicated are verbal memory, executive functions and working memory.*

Aim of the study: *The aim of the present study was to investigate the memory function of alcohol dependent patients and compared to normal healthy controls.*

Materials and Methods: *The sample consisted of 41 male patients of alcohol dependent aged between18 to 50 years, selected using purposive sampling technique and 41 normal healthy controls (having General Health Questionnaire-12 score of less than three) matched for age, sex and education with the former group. After obtaining an informed consent details of socio-demographic variables and clinical history were evaluated on interview with the patient on first contact and administered PGI-Memory scale. The present research work was approved by the ethical committee of the University.*

Result and Conclusion: *The alcohol dependent patients showed deficits on all memory domains viz. recent memory, mental balance, attention and concentration, delayed and immediate recall, retention for similar and dissimilar pairs, visual retention and recognition.*

Keywords: Alcohol dependent, memory

About authors: **M. A. Psychology ** Associate Professor, Department of Psychological Sciences, * & **Central University of South Bihar, Panchanpur, Gaya, India*

INTRODUCTION:

Excessive alcohol intake is associated with various medical, social, psychological and cognitive problems i.e. heart disease, brain damage, disturbed family relationship, anxiety, depression, sleep and eating problem, suicidal thoughts and memory impairment.

Memory problem is a common symptom of alcohol dependent patients. Various cognitive functions are impaired in alcohol-dependent patients, particularly executive functions (Ihara et al., 2000), visuospatial skills (Green et al., 2010),

episodic memory (Le Berre et al., 2010) and working memory (Zorumski et al., 2014).

A study conducted by Ashtari et al. (2011) with 14 “treatment-seeking” cannabis dependence and 14 matched normal control group. It was found that cannabis dependent patient had deficits in verbal learning and memory.

A study by Noel et al. (2012) consisted of a sample of 36 male alcoholic patients, and 36 healthy controls. It was

found the alcoholic patients had impaired executive functions combined with below normal performance on both free and delayed recall.

Kopera et al. (2012) used Mini International Neuropsychiatric Interview, Structured Diagnostic Interview, Beck Depression Inventory, Verbal Intelligence Quotient (VIQ) from Wechsler Adult Intelligence Scale, Cambridge Neuropsychological Test Automated Battery, with a sample of 42 currently abstinent alcohol dependence male patients and 34 healthy controls. Differences in cognitive performance were found between alcohol dependence patients and healthy controls.

A study done by Adhikari et al. (2016) in 62 alcohol dependent patient and found that 54.8% patients had significant memory dysfunction mainly in visual retention, remote memory, verbal retention of dissimilar pairs and delayed recall.

Patients performed significantly worse than controls in all cognitive domains i.e. verbal learning and memory, executive function and visuospatial abilities (Ioime et al., 2018).

A study conducted by Ghosh et al. (2018) with sample of 50 alcohol dependent patient and 50 normal controls. It was found that the alcohol dependent patients had poor executive function as compared to normal control.

A study done by Gupta et al. (2019) with sample of 50 alcohol dependent and 50 normal control. Finding revealed that alcohol dependent patient had poor memory functions as compared to normal control.

Aim of the study: The aim of the study was to investigate the memory function in alcohol dependent patients and normal healthy controls.

Objective of the study:

- To find the memory function in patients with alcohol dependent as compared to normal healthy controls.

Hypothesis:

- There would be difference in memory functions in patients with alcohol dependent as compared to normal healthy control population

METHODOLOGY:

Sample: Total 82 male adults **(**41 clients of alcohol dependent and 41 no alcohol dependants) were selected through the Purposive sampling technique from NGO Patna, India.

Inclusion criteria for alcohol dependent group

- Patients of alcohol dependent as per Diagnostic Criteria of Research (DCR) of International Classification of Diseases (ICD – 10).
- Patients who are co-operative for assessment of memory function.
- Age 18 to 50 years.
- Minimum educational qualification of 6th standard.
- Male patients

Exclusion criteria for alcohol dependent group:

- Evidence of significant organic/neurological disorders.
- Head injury

Inclusion criteria for normal healthy control group

- Persons from general population matched for age, sex, and education status to the alcohol dependent group.
- General Health Questionnaire (GHQ-12) scores less than three.

Exclusion criteria for normal healthy control group:

- History of personality disorder and mental retardation.
- History of severe head trauma.
- Family history of significant mental illness, alcohol or drug use disorder in first- degree relatives.

Tools to be used in collection of data:

Socio-demographic and Clinical Data Sheet: A socio-demographic and clinical data sheet was specially designed for the present study to record socio-demographic and clinical variables such as age, sex, education, marital status, occupation, age at onset of illness, amount of alcohol intake, course of illness and personal history.

The Post Graduate Institute, Memory Scale (PGI-Memory Scale): This scale was developed by Pershad and Wig. (1977). It is a specially designed test for evaluation of memory in semi-literate people suitable for the Indian population. It is comprised of 10 sub-tests to measure different components of memory (remote and recent memory, mental balance, attention and concentration, delayed and immediate recall, verbal retention of similar and dissimilar pairs, visual retention and recognition of common objects).

General Health Questionnaire (GHQ-12): It was developed by Goldberg and William in 1988. This scale was administered on normal controls to rule out any psychiatric morbidity. GHQ-12 is a short version of the General Health Questionnaire, which consists of 12 items. The short version is less time consuming and so a better screening instrument.

Procedure

Patients and normal controls giving informed consent were selected on the basis of inclusion/exclusion criteria (after administering GHQ-12 on the normal controls). The diagnosis of alcohol dependent was made using ICD-10 DCR (WHO, 1992). Details of socio-demographic variables and clinical history were evaluated on interview with the patients on first contact and PGI- Memory scale was administered.

Results-statistical analysis

The collected data was analyzed by the statistical software Statistical Package for Social Sciences (SPSS) version 16.0 (for Windows). Appropriate statistical measures were applied to analyze the collected data. In descriptive statistics, mean and standard deviation were calculated for continuous variables. Inferential statistical measures like $\chi 2$ test was used for group comparison of discrete or categorical variables, while independent sample t-test were used for comparing the continuous variables.

RESULTS:

Table 1: Group comparison of socio-demographic characteristics (continuous variables) between Alcohol dependent patients & Normal control

Variables	**Alcohol Dependence (N=41)**	**Normal Control (N=41)**	***t* value**	***df***	***P***
	Mean ± SD	**Mean ± SD**			
Age (in years)	32.95 ± 7.07	33.88 ± 8.04	.554	80	.581
Education	11.66 ± 3.23	12.29 ± 2.41	1.01	80	.317

Table 1 shows the comparison of the socio-demographic characteristics (continuous variables) of the alcohol dependent and normal control group. There was no significant difference was seen between patients and normal control group in terms of age and education.

Table 2: Group comparison of socio-demographic characteristics (categorical variables) between alcohol dependent and normal control group

Variables		**Alcohol dependent N= 41**	**Normal control N= 41**	**$\chi 2$**	***Df***	***P***
Marital status	Single	14 (34.15)	15 (36.59)	.054	2	.973
	Married	26 (63.41)	25(60.97)			
	Others	1 (2.44)	1 (2.44)			
Domicile	Rural	24 (58.54)	22 (53.66)	.198	1	.824
	Urban	17 (41.46)	19 (46.34)			
Types of family	Nuclear	27 (65.85)	25 (60.98)	.210	1	.819
	Joint	14 (34.15)	16 (39.02)			

Table 2 shows the comparison of the socio-demographic characteristics (categorical variables) of the alcohol dependent patients and normal control group. There were no significant difference found between patients and normal control group in term of marital status, domicile and types of family.

Table 3: Clinical characteristics of alcohol dependent patients (N= 41)

Variables		Mean ± SD
Duration of alcohol intake (in years)		10.41 ± 6.68
Started age (in years)		22.46 ± 5.50
		n (%)
Onset of problem	Abrupt	12 (29.27)
	Acute	16 (39.02)
	Insidious	13 (31.71)
Types	Alcohol	5 (12.20)
	Alcohol and cannabis	27 (65.85)
	Others	9 (21.95)
Precipitating factor	Yes	13 (31.7)
	No	28 (68.3)

Table 3 shows the clinical characteristics of the alcohol dependent patients. The mean duration of alcohol intake of the alcohol dependent patients was found to be 10.41 ± 6.68 years while the mean age of started alcohol was 22.46 ± 5.50 years. Out of 41 patients 12 (29.27%) had abrupt onset, 16 (39.02%) had acute onset of illness and 13 (31.71%) had insidious onset of the illness. Out of 41 patients 27 (66.85%) used alcohol and cannabis, 13 (31.7%) had precipitating factors.

Table 4: PGI Memory Scale Dysfunctional Score (N= 41)

Components of memory	Dysfunction	Alcohol Dependent (N=41)	Normal Control (N=41)
Remote Memory	0	34 (82.9)	41 (100)
	2	2 (4.9)	0 (0)
	3	5 (12.2)	0 (0)
		Total= 7 (17.1)	**Total= 0 (0)**
Recent Memory	0	28 (68.3)	41 (100)
	2	10 (24.4)	0 (0)
	3	3 (7.3)	0 (0)
		Total= 13 (31.7)	**Total= 0 (0)**
	0	5 (12.2)	35 (85.4)

	2	6 (14.6)	4 (9.8)
	3	30 (73.2)	2 (4.9)
Mental Balance		**Total= 36 (87.8)**	**Total= 6 (14.7)**
	0	1 (2.4)	17 (41.5)
	2	3 (7.3)	14 (34.1)
	3	37 (90.2)	10 (24.4)
Attention and Concentration		**Total= 40 (97.5)**	**Total= 24 (58.5)**
	0	10 (24.4)	32 (78)
	2	7 (17.1)	7 (17.1)
Delayed Recall	3	24 (58.5)	2 (4.9)
		Total= 31 (75.6)	**Total= 9 (22.0)**
	0	15 (36.6)	33 (80.5)
	2	10 (24.4)	8 (19.5)
	3	16 (39.0)	0 (0)
Immediate Recall		**Total= 26 (63.4)**	**Total= 8 (19.5)**
	0	11 (26.8)	27 (65.9)
	2	16 (39.0)	10 (24.4)
	3	14 (34.1)	4 (9.8)
Verbal Retention for Similar pairs		**Total= 30 (73.1)**	**Total= 14 (34.2)**
	0	4 (9.8)	21 (51.2)
	2	3 (7.3)	12 (29.3)
	3	34 (82.9)	8 (19.5)
Verbal Retention for Dissimilar pairs		**Total= 37 (90.2)**	**Total= 20 (48.8)**
	0	2 (4.9)	7 (17.1)
	2	3 (7.3)	5 (12.2)
	3	36 (87.8)	29 (70.7)
Visual Retention		**Total= 39 (95.1)**	**Total= 34 (82.9)**
	0	10 (24.4)	33 (80.5)
	2	6 (14.6)	5 (12.2)
	3	25 (61.0)	3 (7.3)
Recognition		**Total= 31 (75.6)**	**Total= 8 (19.5)**

Table 4 shows dysfunction rating of PGI-Memory Scale. It revealed that 7 (17.1%) alcohol dependent patients had dysfunction in remote memory and 13 (31.7%) in recent memory. Mental balance dysfunction was 36 (87.8%) in alcohol dependent and 6 (14.7%) in normal control group. Attention and concentration dysfunction was 36 (87.8%) in alcohol dependent and 6 (14.1%) in control group. Delayed recall dysfunction was 31 (75.6%) in alcohol group and 9 (22%) in control group. Immediate recall dysfunction was 26 (63.4%) in alcohol group and 8 (19.5%) in control group. Verbal retention for similar pairs dysfunction was 30 (73.1%)

in alcohol group and 14 (34.2%) in control group. Verbal retention for dissimilar pairs dysfunction was 37 (90.2%) in alcohol dependent and 20 (48.8%) in control group. Visual retention dysfunction was 39 (95.1%) in alcohol group and 34 (82.9%) in control group. Recognition dysfunction was 31 (75.6%) in alcohol dependent and 8 (19.5%) in control group.

Table 4: Comparison of memory function between alcohol dependent patients and normal control group (N= 41)

Domains of PGI Memory scale	**Alcohol dependent (N= 30)**	**Normal control (N= 30)**	***t* (df= 80)**	***P***
	Mean ± SD	**Mean ± SD**		
Remote memory	5.49 ± .84	5.78 ± .47	1.94	.056
Recent memory	4.61 ± .66	4.98 ± .35	**3.10****	.003
Mental balance	4.83 ± 2.06	8.37 ± 1.11	**9.67*****	<.001
Attention and concentration	5.93 ± 1.75	8.12 ± 1.56	**5.97*****	<.001
Delayed recall	6.98 ± 1.91	8.93 ± 1.14	**5.59*****	<.001
Immediate recall	7.20 ± 1.93	10.27 ± 1.70	**7.62*****	<.001
Retention for similar pairs	3.76 ± 1.15	4.46 ± .74	**3.29****	.001
Retention for dissimilar pairs	6.00 ± 3.88	10.10 ± 2.26	**5.83*****	<.001
Visual retention	2.61 ± 2.25	3.51 ± 1.59	2.08*	.040
Recognition	7.00 ± 1.73	8.85 ± 1.37	**5.37*****	<.001

*p<.05 level (2- tailed). **p<.01 level (2- tailed). ***p<.001 level (2- tailed).

Table 4 shows comparison of memory function between alcohol dependent patients and normal control group. There was significant lower score in recent memory (t= 3.10, df= 80, p .003), mental balance (t= 9.67, df= 80, p <.001), attention and concentration (t= 5.97, df= 80, p <.001), delayed recall (t= 5.59, df= 80, p <.001), immediate recall (t= 7.62, df= 80, p <.001), retention for similar pairs (t= 3.29, df= 80, p .001), retention for dissimilar pairs (t= 5.83, df= 80, p <.001) visual retention (t= 2.08, df= 80, p .040) and recognition (t= 5.37, df= 80, p <.001). There was no significant difference in remote memory between alcohol dependent patients and normal control group.

DISCUSSION:

The aim of the study was to investigate the memory function in alcohol dependent patients and normal healthy controls. Mean age of the alcohol dependent patients was found to be 32.95 (± 7.07) years. Patients with educational attainment of at least 6th standard were selected. Mean education of alcohol dependent patients was found to be 11.66 (± 3.23) years. These finding are supported by various study (Noel et al., 2012). The duration of alcohol intake in the alcohol dependent patients sample was 10.41 (± 6.68) years. Similarly, Goldstein et al. (2004) study on alcohol and cocaine dependent patients found the duration of illness to be 10.5 (± 5.6) years.

It revealed that 7 (17.1%) alcohol dependent patients had dysfunction in

remote memory, 13 (31.7%) in recent memory, 36 (87.8%) in mental balance, 36 (87.8%) in attention and concentration, 31 (75.6%) in delayed recall, 26 (63.4) in immediate recall, 30 (73.1%) in verbal retention for similar pairs, 37 (90.2%) in verbal retention for dissimilar pairs, 39 (95.1%) in visual retention and 31(75.6%) in recognition. This shows that alcohol dependent patients had global dysfunction in memory function tests. A study conducted by Gupta et al. (2019) and found similar result.

On comparison of the results of performance on all memory functions test between alcohol dependent patients and normal controls, it was found that alcohol dependent patients showed deficits on almost all memory domains on PGI-Memory scale from that of healthy controls. This shows that the alcohol dependent patients had global deficits in test performance that significantly differed from that healthy control. This finding is similar to most international studies (Ashtari et al., 2011; Kopera et al., 2012; Ioime et al., 2018; Gupta et al., 2019) that have found generalized impairment in almost all areas of memory functions viz. working memory, episodic memory, recent memory and remote memory, spatial working memory. A study done by Adhikari et al. (2016) and found that 54.8% alcohol dependent patients had significant memory dysfunction mainly in visual retention, remote memory, verbal retention of dissimilar pairs and delayed recall. The poorer performance of the alcohol dependent subjects in the recent, mental balance, attention and concentration, immediate recall, delayed recall, recognition indicates a lower capacity to retain and manipulate information in verbal memory.

Conclusion: The alcohol dependent sample showed deficits on all memory domains viz. recent memory, mental balance, attention and concentration, delayed and immediate recall, retention for similar and dissimilar pairs, visual retention and recognition. Limitations: The study sample was relatively small. Our sample of alcohol dependent patients contained only male which may have, to a certain extent limited the findings of the study to be generalized to the alcohol dependent population.

REFERENCES:

Noël, X., Linden, M. V., Brevers, D., Campanella, S., Hanak, C., Kornreich, C., & Verbanck , P. (2012). The contribution of executive functions deficits to impaired episodic memory in individuals with alcoholism. *Psychiatry Research, 198(1),* 116–122.

Kopera, M., Wojnar, M., Brower, K., Glass, J., Nowosad, I., Gmaj, B., & Szelenberger, W. (2012). Cognitive functions in abstinent alcohol-dependent patients. *Alcohol, 46(7),* 665- 671.

Ashtari, M., Avant, B., Cyckowski, L., Cervellione, K. L., Roofeh, D., Cook, P., Gee, J., Sevy, S., & Kumra, S. (2011). Medial temporal structures and memory functions in adolescents with heavy cannabis use. *Journal of Psychiatric Research, 45(8),* 1055- 1066.

Ioime, L., Guglielmo, R., Affini, G. F., Quatrale, M., Martinotti, G., Callea, A., Savi, E., & Janiri, L. (2018). Neuropsychological performance in alcohol dependent patients: A one-year longitudinal study. *Psychiatry Investig, 15(5),* 505-513.

Gupta, N. S., Mohan, C., & Singh, M. (2019). To study the prevalence of cognitive impairment in alcohol dependence. *International Archives of Integrated Medicine, 6(9),* 72-81.

Ghosh, P., Sharma, S., & Victor, R. (2018). A study on the executive dysfunction in alcohol dependent persons in Barak valley and its adjoining areas. *Journal of Psychiatry Studies, 1(1),* 1-7.

Ihara, H., Berrios, G. E., & London, M. (2000). Group and case study of the dysexecutive syndrome in alcoholism without amnesia. *Journal of Neurology, Neurosurgery & Psychiatry, 68(6),* 731–737.

Green, A., Garrick, T., Sheedy, D., Blake, H., Shores,E. A., & Harper, C. (2010). The effect of moderate to heavy alcohol consumption on neuropsychological performance as measured by the repeatable battery for the assessment of neuropsychological status. *Alcoholism: Clinical and Experimental Research, 34(3),* 443–450.

Le Berre, A. P., Pinon, K., Vabret, F., Pitel, A. L., Allain, P., Eustache, F., & Beaunieux, H. (2010). Study of meta-memory in patients with chronic alcoholism using a feeling-of-knowing episodic memory task. *Alcoholism: Clinical and Experimental Research, 34(11),* 1888–1898.

Zorumski, C. F., Mennerick, S., & Izumi, Y. (2014). Acute and chronic effects of ethanol on learning-related synaptic plasticity. *Alcohol, 48(1),* 1–17.

Goldberg, D. P., & William, P. (1988). A user guide to general health questionnaire. Windsor: NFER-Nelson.

Pershad, D., & Wig, N. N. (1977). Revised manual for PGIMS. National Psychological Corporation, Agra.

Adhikari, S., Rana, M., Shakya, S., and Ojha, S. P. (2016). Cognitive dysfunctions in patients with alcohol dependence syndrome in a tertiary hospital in Kathmandu. *Joournal of Nepal Medical Association, 54(201),* 17-23.