

Effectiveness of Neurobic Exercises on Level of Memory among Sober Alcohol Dependents Admitted in Deaddiction Centers at Selected Areas.

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ABSTRACT

Neurobics, a term by Lawrence Katz and Manning Rubin, refers to brain exercises involving non-routine thinking and movement. These exercises engage multiple senses, enhancing memory, mood, and cognitive function by promoting brain cell growth and increasing blood flow. A study on alcohol-dependent individuals revealed significant cognitive impairments in memory, attention, and concentration. A strong negative correlation was found between memory function and the duration and severity of alcohol dependence, highlighting the need for early intervention.

METHODOLOGY

A quasi-experimental, non-randomized control group design was used with a sample of 60 sober alcohol dependents in deaddiction centers. Participants were divided into experimental (n=30) and control (n=30) groups using a non-probability purposive sampling technique. The experimental group received neurobic exercises for 28 days, while the control group did not. Memory levels were measured using a modified memory assessment questionnaire, validated by experts with a content validity index of 0.95. Data analysis involved descriptive and inferential statistics using paired and unpaired t-tests. The content validity of the tool was done and was found to be 0.95. The study was done for 27 days. neurobic exercises was administered to the experimental group of 30 sober alcohol dependents and was not administered to the control group of 30 sober alcohol dependents in deaddiction centers. The post-test was collected on the 29th day.

RESULT

The analysis of the study was done using descriptive and inferential statistics. The master sheet was prepared and coding of the responses was done. The data was presented in the form of tables and charts. Statistics were performed with the help of paired t-tests, un-paired t-tests and chi-square tests.

The results indicate that in the experimental pre-test group reveals that in the highest percentage (50%) of respondents had a low memory score, followed by 43.33% with an average memory score, and only 6.67% with a strong memory score. In the post-test, there was a significant improvement, with 70% of respondents achieving an average memory score and 30% attaining a strong memory score. Notably, none of the respondents remained in the poor memory category. This indicates that the intervention had a positive impact on improving memory levels among sober alcohol dependents in the experimental group. The statistical analysis in the experimental group revealed a paired t-value of 5.85, which is greater than the critical table value of 2.045 at $df = 29$ and $p \leq 0.05$. The corresponding p-value for the calculated t-value is 0.001, indicating that the result is statistically significant.

For the control group, the statistical analysis of the pre-and post-test levels of memory among sober alcohol dependents revealed a paired t-value of 0.06, which is less than the critical table value of 2.045 at $df = 29$ and $p \leq 0.05$. The corresponding p-value for the calculated t-value is 0.95, indicating that the result is not statistically significant.

The unpaired t-test was conducted to compare the post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from experimental and control groups.

The results indicate that unpaired t-value of 6.37, which is greater than the critical table value of 2.001 at $df = 58$ and $p \leq 0.05$. The corresponding p-value for the calculated t-value is 0.001, indicating that the result is statistically significant.

The p-value (0.001) is less than 0.05, indicating a statistically significant difference between the post-test levels of memory of the experimental and control groups. This suggests that the intervention had a significant positive effect on level of memory among the experimental group.

The chi-square analysis indicates that the type of family, education, and annual income have a significant association with the pre-test level of memory among sober alcohol dependents admitted to de-addiction centers ($p \leq 0.05$). However, age, occupation, and family history of alcohol addiction did not demonstrate a significant association with the pre-test findings.

KEY WORDS: neurobic exercises, sober alcohol dependents, level of memory, de-addiction centers.

INTRODUCTION

Neurobics, a term by Lawrence Katz and Manning Rubin, refers to brain exercises involving non-routine thinking and movement. These exercises engage multiple senses, enhancing memory, mood, and cognitive function by promoting brain cell growth and increasing blood flow. A study on alcohol-dependent individuals revealed significant cognitive impairments in memory, attention, and concentration. A strong negative correlation was found between memory function and the duration and severity of alcohol dependence, highlighting the need for early intervention. Alcohol-dependent men aged 36-55 showed memory and cognitive impairments due to thiamine deficiency. The study found a strong negative correlation between alcohol dependence and memory, stressing the importance of early intervention to prevent neurocognitive decline. WHO (2018) reports that alcohol abuse causes 3 million deaths annually. In 2019, 414,000 adolescents and 14.1 million adults in the U.S. had alcohol use disorders, which negatively affect social, occupational, and health aspects.

Recent studies (2023) have highlighted the significant impact of alcohol dependence on memory in middle-aged men. Study shows memory loss may result from excessive alcohol consumption. Alcohol consumption has a significant impact on memory, affecting both short-term and long-term cognitive functions. It interferes with the hippocampus, a key brain region for memory formation, leading to short-term memory loss and blackouts where individuals cannot recall events while intoxicated.

(2024) conducted a quasi-experimental pre-test post-test design on the effectiveness of neurobic exercise on memory enhancement among elderly people in selected old age homes: a quasi-experimental study. Conducted with 60 participants at a nursing institute, the study used a quantitative approach and collected data through demographic questionnaires and a standardized mini-mental status examination scale. Results indicated a significant improvement in memory after the intervention, demonstrating that neurobic exercises effectively enhance cognitive function.

BACKGROUND OF STUDY

(2025) In the International Journal of Community Medicine and Public Health, examined the prevalence and patterns of alcohol consumption in India. The study found that the prevalence of alcohol use ranged from 10% to 60%, with significantly higher consumption among men, particularly middle-aged individuals. Alcohol dependence in this group was primarily influenced by social occasions, peer pressure, occupational stress, and staying away from family. The study highlighted that chronic alcohol consumption leads to severe cognitive decline, including memory impairment, affecting recall ability, attention, and executive functions.

NEED OF STUDY

Alcohol dependence can have detrimental effects on various cognitive functions including memory, attention, and executive function. Alcohol intake has a variety of impacts, although cognitive impairments receive the least attention. Neurobic exercises, which involve activities that challenge the brain in novel and unexpected ways, can

help promote neuroplasticity and enhance cognitive function so it will help them to improve their memory functioning. When individuals with alcohol dependence stop drinking, they often experience withdrawal symptoms, including cognitive impairments such as memory problems. These symptoms can range from mild to severe and may persist for weeks or months after cessation of drinking.

(2023) a 2-year follow-up study of 312 individuals revealed a noteworthy difference in the cognitive function of alcohol-dependent individuals in comparison to those who are not dependent on alcohol. There is enough data to conclude that heavy alcohol consumption is linked to more severe cognitive impairments that may not go away. According to the current study, working memory, executive functions, and high impulsivity are the areas where people with alcohol dependency have the greatest cognitive abnormalities. The average years of consumption of alcohol was 16.72 years; surprisingly, all the patients in this study drank alcohol daily at an average of 261.25 ml/day, and the country liquor majorly, 73.33%. The effects of the consumption of alcohol are many, but cognitive deficits are the least looked upon. When compared with control groups, abstinent alcoholic males score badly in mental speed, sustained attention, verbal working memory, logical memory, verbal memory, visuo-constructive ability, and executive functioning (planning, processing speed, and cognitive flexibility).

METHODOLOGY

The current research was used to effectiveness of neurobic exercises on level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas. The researcher used a quantitative research approach in the present study. The research design that is chosen for this study is a quasi-experimental non-equivalent control group design. The population was sober alcohol dependents admitted in deaddiction centers at selected areas. The sample consisted of 60 sober alcohol dependents admitted in deaddiction centers at selected areas. The sampling technique used was the non-probability purposive sampling technique. The setting was a selected area of deaddiction centers. Memory levels were measured using a modified memory assessment questionnaire among sober alcohol dependents. The intervention given to the selected samples was a neurobic exercises. The content validity of the tool was done and was found to be 0.95. The study was done for 28 days. Neurobic exercises was administered to the experimental group of sober alcohol dependents admitted in deaddiction centers at selected areas and was not administered to the control group. The post-test was collected on the 29th day.

Steps of intervention

- a. First the researcher established good rapport with the samples and introduced the study topic to the samples.
- b. The researcher was collecting the data regarding demographic variables. The researcher assessed the level of memory by using modified Memory assessment questionnaires.
- c. The researcher explained about neurobic exercises.
- d. Neurobic exercises will be instructed to perform.
- e. After the end of the intervention post-test data will be collected using modified Memory assessment questionnaires.

Plan of data collection and data analysis:

1. Approval from the research committee member and written permission will be obtained from head of institution to conduct research.
2. Formal permission was obtained from the concerned authority. Subjects were taken from the selected deaddiction center using non-probability purposive sampling technique. The investigator introduced themselves and informed the samples about the nature of the study to ensure better cooperation during the data collection.
3. The purpose of the research was explained to the samples.
4. Informed consent was obtained from samples.
5. Samples were selected by using non probability purposive sampling technique and divided into experimental and control group.

6. Performed pre-test on both experimental and control groups through assessment of the level of memory among sober alcohol dependents through the prepared tool.
7. Then participants in the experimental group provide neurobic exercises for 15-20 minutes one time per week for 28 days.
8. On the 28th day post-test was conducted on both group experimental and control groups.
9. The data was gathered for main study, process began from 22 December 2024-19 January 2025. Actual data collection was done on 60 sober alcohol dependents admitted in deaddiction centers at selected areas meeting the criteria for the study.
10. The following schedule was followed for data collection: objective of the study was discussed with subjects and their consent was obtained for the study. They were assured about the confidentiality of the data.

Collected data will be analyzed with the help of paired t test.

RESULT

Section I: Description of Sociodemographic data

Age

The percentage-wise distribution of respondents according to their age reveals that the highest percentage (46.67%) of respondents were in the age group of 35.1 to 45 years, followed by 30% in the 25 to 35 years category, and 23.33% in the above 45.1 years group. This indicates that the majority of respondents were in the age group of 35.1 to 45 years.

Gender

The percentage-wise distribution of respondents according to their gender reveals that all respondents (100%) were male, while none (0%) belonged to the female or transgender categories. This indicates that the sample was entirely composed of male participants.

Type of family

The percentage-wise distribution of respondents according to their family type reveals that the highest percentage (60%) of respondents belonged to joint families, followed by 20% each in nuclear and extended families. This indicates that most respondents came from joint families, with an equal proportion coming from nuclear and extended family setups.

Education

The percentage-wise distribution of respondents according to their educational level reveals that the highest percentage (33.33%) of respondents had secondary education, followed by 30% who were graduates, 26.67% with primary education, 6.67% who were postgraduates, and 3.33% with no formal education. This indicates that the majority of respondents had completed secondary or graduate-level education, with a smaller proportion having postgraduate qualifications or no formal education.

Occupation

The percentage-wise distribution of respondents according to their occupation reveals that (30%) were engaged in private jobs, followed by 16.67% were government employees 23.33% in agriculture and the respondents (30%) were business personnel. This indicates a strong predominance of private-sector employment and business personnel among the respondents.

Annual income

The percentage-wise distribution of respondents according to their annual income reveals that the highest percentage (63.33%) of respondents had an income above 2 lakhs, followed by 30% in the income range of 50,001 to 2 lakhs, and 6.67% earning below 50,000. This indicates that most respondents had a higher income, with a smaller proportion in the lower-income categories.

family history of alcohol addiction

The percentage-wise distribution of respondents according to their family history of alcohol addiction reveals that 60% reported no family history of alcohol addiction, while 40% indicated a positive family history. This suggests that most respondents did not have a familial predisposition to alcohol addiction.

Section II

To assess the pre-existing level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas.

Table No: 4.1

Distribution of respondents according to the pre-existing level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the experimental group and control group
(N=60) (Experimental group-30 and Control group-30)

SN	Level of Memory	Experimental group		Control group	
		F	%	F	%
1	High Score (37-48): Strong memory.	02	6.67	00	00
2	Medium Score (25-36): Average memory.	13	43.33	18	60
3	Low Score (12-24): Poor memory.	15	50	12	40

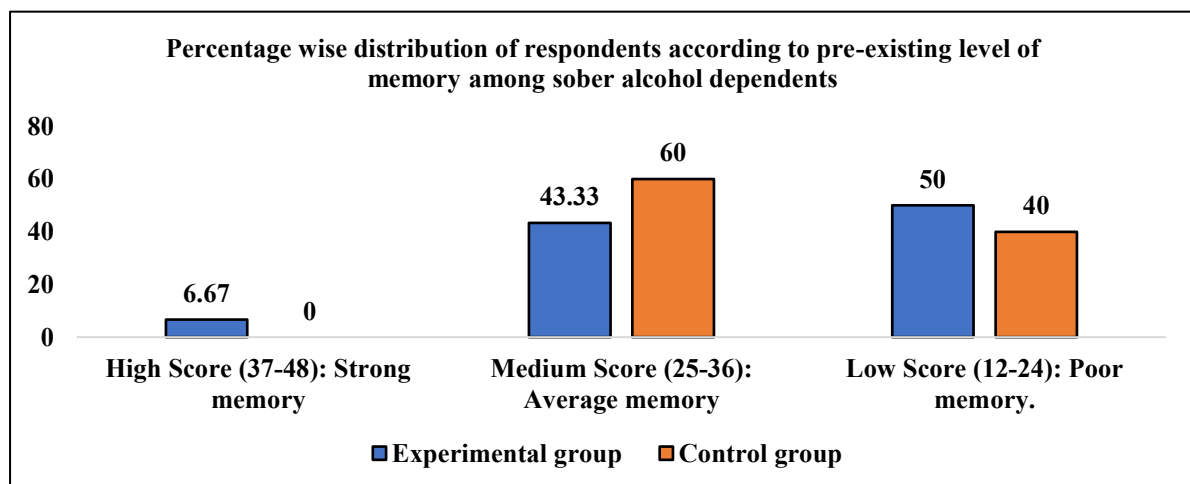


Fig no: 4.8

Bar diagram showing the percentage-wise distribution of respondents according to the pre-existing level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the experimental group and control group.

The percentage-wise distribution of respondents according to their pre-existing level of memory among sober alcohol dependents admitted to deaddiction centers reveals that

In the experimental group, the highest percentage (50%) of respondents had a low score, indicating poor memory, followed by 43.33% with an average memory score, and only 6.67% with a strong memory score.

In the control group, the majority (60%) had an average memory score, followed by 40% with a low score, and none of the respondents had a strong memory score.

This indicates that a significant proportion of sober alcohol dependents exhibited poor or average memory levels, with only a small percentage demonstrating strong memory.

Section III

To assess the pre-test and post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the experimental group and control group

Table No: 4.2

Distribution of respondents according to pre-test and post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the experimental group.
(N=30)

SN	Level of Memory	Pre-test		Post-test	
		F	%	F	%
1	High Score (37-48): Strong memory.	02	6.67	09	30
2	Medium Score (25-36): Average memory.	13	43.33	21	70
3	Low Score (12-24): Poor memory.	15	50	00	00

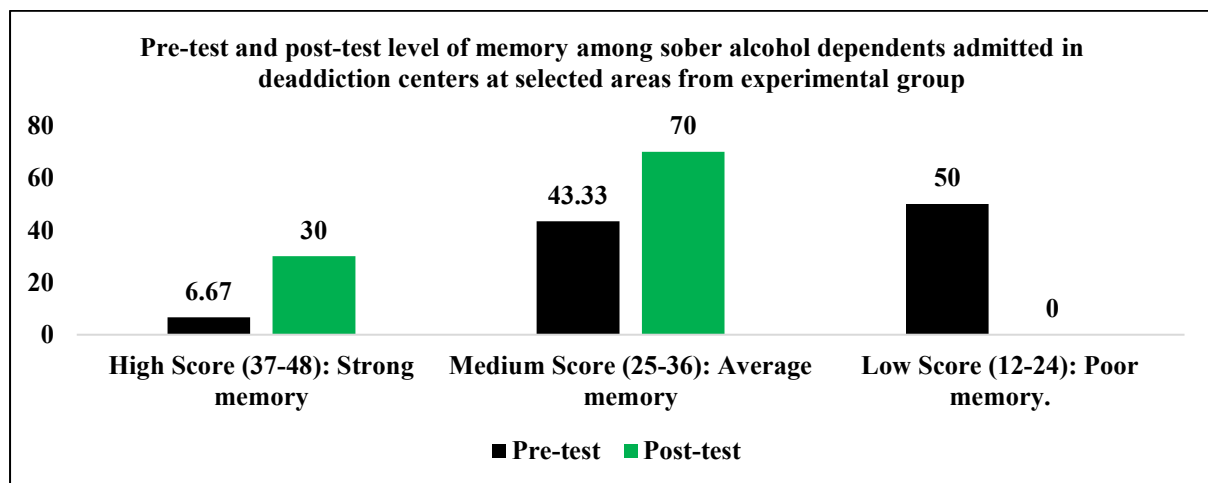


Fig no: 4.9

Distribution of respondents according to pre-test and post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the experimental group.

The percentage-wise distribution of respondents according to their pre-test and post-test level of memory among sober alcohol dependents in the experimental group reveals that:

In the pre-test, the highest percentage (50%) of respondents had a low memory score, followed by 43.33% with an average memory score, and only 6.67% with a strong memory score.

In the post-test, there was a significant improvement, with 70% of respondents achieving an average memory score and 30% attaining a strong memory score. Notably, none of the respondents remained in the poor memory category. This indicates that the intervention had a positive impact on improving memory levels among sober alcohol dependents in the experimental group.

Table No: 4.3

Paired 't' value of pre and post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas in the Experimental group.

(N=30)

SN	Group	Mean	SD	't' value	P Value	Level of significance
1	Pre-test	25.53	5.57	5.85	0.001	Significant
2	Post-test	33.2	4.54			

DF=29, table value = 2.045 at $p \leq 0.05$

The statistical analysis of the pre-and post-test levels of memory among sober alcohol dependents admitted in deaddiction centers at selected areas in the experimental group revealed a paired t-value of 5.85, which is greater than the critical table value of 2.045 at $df = 29$ and $p \leq 0.05$. The corresponding p-value for the calculated t-value is 0.001, indicating that the result is statistically significant. This demonstrates that there is a significant improvement in the level of memory among sober alcohol dependents in the experimental group after the intervention, suggesting that the intervention was effective in enhancing memory levels.

Table No: 4.4

Distribution of respondents according to pre-test and post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the control group. (N=30)

SN	Level of Memory	Pre-test		Post-test	
		F	%	F	%
1	High Score (37-48): Strong memory.	00	00	01	3.33
2	Medium Score (25-36): Average memory.	18	60	17	56.67
3	Low Score (12-24): Poor memory.	12	40	12	40

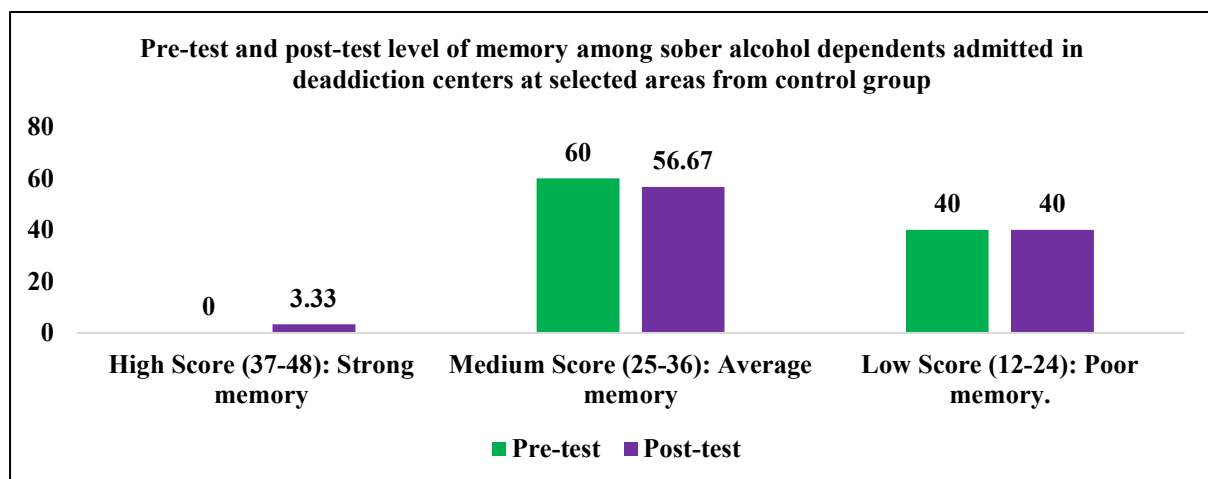


Fig no: 4.10

Distribution of respondents according to pre-test and post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the control group

The percentage-wise distribution of respondents according to their pre-test and post-test level of memory among sober alcohol dependents in the control group reveals that:

In the pre-test, the majority (60%) of respondents had an average memory score, followed by 40% with a low memory score, and none had a strong memory score.

In the post-test, there was minimal improvement, with 56.67% maintaining an average memory score, 40% still in the poor memory category, and only 3.33% achieving a strong memory score.

Table No: 4.5

Paired 't' value of pre and post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the control group.(N=30)

DF=29, table value = 2.045 at $p \leq 0.05$

SN	Group	Mean	SD	't' value	P Value	Level of significance
1	Pre-test	25.9	4.54	0.06	0.95	Not significant
2	Post-test	25.83	4.42			

The statistical analysis of the pre-and post-test levels of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the control group revealed a paired t-value of 0.06, which is less than the critical table value of 2.045 at $df = 29$ and $p \leq 0.05$. The corresponding p-value for the calculated t-value is 0.95, indicating that the result is not statistically significant.

This demonstrates that there is no significant difference in the level of memory among sober alcohol dependents in the control group between the pre-and post-test phases, suggesting that no effective change in memory levels occurred without the intervention.

Table No: 4.6

Unpaired 't' value of post-test level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from Experimental and control groups. (N=60)

DF=58, table value = 2.001 at $p \leq 0.05$

SN	Group	Mean	SD	't' value	P Value	Level of significance
1	Experimental group	33.2	4.54	6.37	0.001	Significant
2	Control group	25.83	4.42			

The statistical analysis of the post-test levels of memory among sober alcohol dependents admitted in deaddiction centers at selected areas from the experimental and control groups revealed an unpaired t-value of 6.37, which is greater than the critical table value of 2.001 at $df = 58$ and $p \leq 0.05$. The corresponding p-value for the calculated t-value is 0.001, indicating that the result is statistically significant.

This demonstrates that there is a significant difference in the post-test memory levels among sober alcohol dependents admitted in deaddiction centers at selected areas between the experimental and control groups, suggesting that the intervention in the experimental group had a positive impact on memory levels.

Section IV

To find out the association between selected demographic variable that is age, gender, type of family, occupation, education, Annual income, family history of alcohol use and pretest study findings.

Table No: 4.7

SN	Variable	Chi-Square (χ^2) Value	p-Value	Significance (p > 0.05)	Table χ^2 Value (df, $\alpha = 0.05$)
1	Age	5.20	0.074	Not Significant	5.99 (df = 2)
2	Type of Family	19.20	0.001	Significant	5.99 (df = 2)
3	Education	23.33	0.001	Significant	7.82 (df = 3)
4	Occupation	2.93	0.402	Not Significant	7.82 (df = 3)
5	Annual Income	29.20	0.001	Significant	5.99 (df = 2)
6	Family History of Alcohol Addiction	1.07	0.302	Not Significant	3.84 (df = 1)

Interpretation:

The chi-square analysis indicates that the type of family, education, and annual income have a significant association with the pre-test level of memory among sober alcohol dependents admitted to de-addiction centers ($p \leq 0.05$). However, age, occupation, and family history of alcohol addiction did not demonstrate a significant association with the pre-test findings.

DISCUSSION

The discussion concludes the research report. A thoughtful section clarifies the meaning of the research findings. The most crucial component of every study report is this one. The result of the current study has been described about the research problem's aim and the research has also discussed the study's findings about the outcome objective. The present study was conducted to assess the effectiveness of neurobic exercises on the level of memory among sober alcohol dependents admitted in deaddiction centers at selected areas. A review of the literature was done and sample size, study design, etc. was determined. The study approach used was the quantitative approach, the study design used was a quasi-experimental nonequivalent control group design. The population included sober alcohol dependents and the accessible population includes sober alcohol dependents admitted in deaddiction centers at selected areas who have remained sober for a month. A total of 60 samples were selected using the non-probability purposive sampling technique; 30 samples were placed in the control group and 30 samples were placed in the experimental group. A modified memory assessment questionnaire was selected as a tool for data collection. Validity of the tool was performed by experts and reliability was done. The tool was found to be valid and reliable. Ethical permission was taken from the ethical committee. A pilot study was done on 10 samples. Analysis of the pilot study depicted that the research was feasible to perform. Before the main data collection consent was taken from the participants by explaining the purpose of the research and assurance of confidentiality was given to them.

The pretest of both groups was collected on day one. The intervention of neurobic exercises was given to the participants placed in the experimental group. Intervention was given 15-20 minutes once a time per week for 28 days. The workbook was maintained by the participant of the experimental group which depicted the kinds of changes they observed in their memory after performing neurobic exercises. On the 28th day, a post-test was collected from both the experimental and control groups.

The master sheet of the data was prepared. Analysis of the study was done using both descriptive and inferential statistics. The data was tabulated; graphs and charts of the data were prepared. Paired t-test and unpaired t-test were used to find the association between the level of memory and demographic variables.

The result of the study depicted those sober alcohol dependents who had undergone neurobic exercises had evidence of improvement in the level of memory in the experimental group, while sober alcohol dependents in the control group had no changes in the level of memory. In the chi-square test which was performed to find the association between level of memory with demographic variables, it found that there is an association between type of family, education, and annual income and no association between age, occupation, and family history of alcohol addiction.

OTHER STUDIES REFER TO

The impact of neurobic exercises on cognitive functioning was assessed in a quasi-experimental research of senior citizens living in assisted living facilities. Sixty individuals in all were chosen and split into experimental and control groups. For six weeks, the experimental group engaged in daily neurobic exercises that emphasized memory recall, sensory stimulation, and problem-solving techniques, while the control group carried on with their regular routines. Both the pre- and post-assessment were conducted using the Mini-Mental State Examination (MMSE). According to the results, the experimental group's mean MMSE scores increased significantly from 22.5 to 26.1 ($p < 0.05$), while the control group's scores did not change significantly. According to the study's findings, neurobic workouts can help older people's memory and cognitive function.

To evaluate the impact of cognitive retraining and neurobic exercises on memory, 40 alcohol-dependent patients undergoing rehabilitation participated in a pre-experimental one-group pre-test/post-test design. For evaluation, standardized instruments like the Wechsler Memory Scale were employed. For four weeks, participants engaged in systematic neurobic exercises (word recall tests, cross-hand activities, and sensory association games) every day. The mean memory scores increased from 68.4 to 74.9 ($p < 0.01$), indicating a considerable improvement in instant recall and attention span. According to the study's findings, neurobic exercises can be used as a straightforward, non-pharmacological intervention to help people in recovery from alcoholism with their memory and cognitive abilities.

CONCLUSION

The study concluded that the sober alcohol dependents admitted in deaddiction centers had strong, average, and low levels of memory. Neurobic exercises were found to be effective in improving the level of memory of the samples. However, the sober alcohol dependents in the control group who did not undergo any intervention had no change in their level of memory. Also, there was no association between age, occupation, and family history of alcohol addiction and there is an association between level of memory and type of family, education, and annual income.

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"Trust the Lord with all your heart lean on your understanding: in all your ways Acknowledge Him, and He will make your path straight." (Proverb 3:5, 6)

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Conflict of interest – There are no conflict of interest.

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