

Effect of Intermittent Fasting on Cognitive Skills in Young Adults

AIM:

To investigate the impact of intermittent fasting on Cognitive Skills in young adults

Fill the Gap:

This study aims to fill the gap by examining the impact of IF on cognitive skills in young adults. Findings could inform dietary recommendations and public health policies to optimize cognitive health in this age group

INTRODUCTION

- Intermittent fasting is an eating plan that switches between fasting and eating on a regular schedule, has been shown to induce metabolic changes.
- Some cognitive skills, such as memory and attention, appear to benefit from IF.
- Enhanced insulin sensitivity and improved glucose metabolism, which are associated with IF, may contribute to these positive outcomes by providing the brain with a more stable and efficient energy supply.
- Additionally, reductions in oxidative stress and inflammation, common benefits of IF, might support overall brain health and cognitive function.

OBJECTIVE

- To measure the basal cognition in both study and control groups using NIMHANS Revised B4ECT ReCoDe questionnaire.
- To measure the cognition levels using this scale after 3 weeks of IF to compare these values with control group

METHODOLOGY

Study Design: An interventional study

Study place : Department of Physiology, Velammal Medical College Hospital & Research Institute, Madurai

Sample Size: 40 participants

- A total of 20 study participants were recruited and were instructed to follow the 14:10 fasting protocol.
- A total of 20 control participants were recruited and asked to eat properly

Study Period: 3 weeks

Questionnaire : NIMHANS Revised B4ECT ReCoDe questionnaire.

Parameters that are used in the evaluation:

- Auditory Verbal Learning and Memory
- Orientation
- Subjective Cognition
- Visual Retention

Study Population: Young adults between the age of 18 to 25 yrs.

Inclusion Criteria:

- Both Gender
- Frequent in Fasting
- Normal BMI
- Adequate Sleep for 6-8 hrs.

Exclusion Criteria:

- History of Metabolic diseases like:
 - Chronic Kidney Disease
 - Coronary Artery Disease
 - Diabetes Mellitus
 - Hypertension
- History of constipation and GI tract problems

Table1. Compare the Pre-Fast vs Post-Fast scores for the cognition assessment

	Mean	Std. Deviation	P-Value
Auditory Verbal Learning and Memory (10 points)-pre fast	8.35	0.933	0.006
Auditory Verbal Learning and Memory (10 points)-post fast	8.60	0.681	
Mean Std. Deviation P-Value			
Orientation (5 points)-pre fast	4.60	0.503	0.016
Orientation (5 points)-post fast	4.70	0.470	
Mean Std. Deviation P-Value			
Patient's Rating (%) -pre fast	97.15	1.182	0.058
Patient's Rating (%) -post fast	96.25	1.517	
Caregiver Rating (%) -pre fast	93.85	2.059	0.000
Caregiver Rating (%) -post fast	95.35	1.348	
Subjective Cognition:-pre fast	95.575	1.5498	0.039
Subjective Cognition:-post fast	95.875	0.8410	
Mean Std. Deviation P-Value			
Visual Retention (4 points)-pre fast	3.55	0.510	0.075
Visual Retention (4 points)-post fast	3.60	0.503	

Table2. Compare the Control group vs. Study Group for the cognition skills

Visual Retention (4 points)-Control	Mean	Std. Deviation	P-Value
Visual Retention (4 points)-Post Fast >= 4	3.60	0.548	1.000
Visual Retention (4 points)-Post Fast < 4	3.60	0.507	1.000

Subjective Cognition:-Control	Mean	Std. Deviation
Subjective Cognition:-Post Fast >= 100.0	95.875	0.8410
Subjective Cognition:-Post Fast < 100.0		

Orientation (5 points)-Control	Mean	Std. Deviation	P-Value
Orientation (5 points)-Post Fast >= 5	4.57	0.535	0.384
Orientation (5 points)-Post Fast < 5	4.77	0.439	0.420

Auditory Verbal Learning and Memory (10 points)-Control	Mean	Std. Deviation	P-Value
Auditory Verbal Learning and Memory (10 points)-Post Fast >= 10	9.00	0.000	0.040
Auditory Verbal Learning and Memory (10 points)-Post Fast < 10	8.56	0.705	0.016

Procedure:

- Clearance from the Institutional ethical committee was taken
- 20 study participants are asked to follow 14:10 approach IF for 3 weeks (NO CALORIE INTAKE IS ALLOWED INCLUDING CAFFINE, ONLY WATER IS ALLOWED TO DRINK).
- Fill the questionnaire before the fast and after the fast
- At the end of each week, data was collected and entered into MS Excel

20 control participants are advised to eat properly and was asked to fill the questionnaire

Statistical Analysis:

Results was analyzed using SPSS software version 25

- Paired T test was used to compare between Pre-Fast and Post-Fast (Table 1.)
- Unpaired T test was used to compare Control and Study Participants (Table 2.)

RESULTS/FINDINGS

The data are collected in the questionnaire and was entered into MS Excel 2013. Their mean and standard deviation was found and those values were used to calculate the P-value. These results suggest that intermittent fasting may positively influence cognitive skills.

Discussion:

Intermittent fasting (IF) improves cognitive function and brain health in a number of ways, including:

1. Brain-derived neurotrophic factor (BDNF)
IF increases the production of ketone bodies, which in turn increases the expression of BDNF genes. BDNF is a protein that affects learning and memory in the brain.

2. Oxidative stress
IF can reduce oxidative stress in the brain.

3. Brain aging
IF can reduce the brain-age-gap estimate, which reflects the biological aging of the brain.

4. Insulin signaling

IF can improve insulin signaling biomarkers in neuron-derived extracellular vesicles.

CONCLUSION:

The study provides preliminary evidence that intermittent fasting can enhance cognitive skills, particularly Auditory Verbal Learning and Memory and Subjective Cognition.

Further research is needed to confirm these findings and explore the underlying mechanisms.

Limitation:

- Inability to determine the exact fasting time of the adults.
- Human errors caused in filling the questionnaire

References

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