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EXTENDED ABSTRACT

Cognitive Effects of Intermittent Fasting vs. Time-Restricted Eating in Middle-Aged and Older Adults: A Systematic Review

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I. Introduction

Despite rising interest in dietary interventions for cognitive health, no synthesis has jointly evaluated intermittent fasting (IF) and time-restricted eating (TRE) in middle-aged and older adults [1]. Intermittent fasting (IF), including time-restricted eating (TRE), is an eating pattern that cycles between periods of fasting and eating within a specific daily time window. Prior reviews lacked age-specific focus, methodological consistency, or consideration of psychological outcomes. This systematic review and meta-analysis evaluate RCTs examining IF and TRE effects on cognition, depression, stress, and mood, addressing current gaps in age-targeted, methodologically robust evidence [2].

II. Methods

We conducted a comprehensive search across PubMed, Scopus, Web of Science, and Science. A comprehensive literature search was conducted on 26 November 2024 using PubMed, Scopus, and Web of Science databases. Search terms combined keywords and MeSH terms related to intermittent fasting (e.g., "intermittent fasting," "time-restricted feeding," "alternate-day fasting," "caloric restriction," "dietary restriction"), cognitive outcomes (e.g., "cognitive function," "mental well-being," "brain health," "memory," "neurocognitive function"), and adult populations (e.g., "adult," "young adult," "middle aged," "18–60 years"). Filters for human studies and English language were applied. Boolean operators (AND/OR) were used to refine and expand the search for relevant peer-reviewed articles. Filters for human studies and English language were applied. Boolean operators (AND/OR) were used to refine and expand the results for relevant peer-reviewed articles.

Direct for articles published between 2000 and June 2025. The search targeted studies examining intermittent fasting (IF) or time-restricted eating (TRE) among adults aged 45 and above, specifically assessing cognitive and psychological outcomes. Eligible studies included randomized controlled trials (RCTs), controlled clinical trials, and observational studies published in English. Studies were included if they involved middle-aged or older adults, applied IF or TRE interventions, and reported cognitive or mood-related outcomes. Studies with mixed-age groups were considered if separate analyses for the target age group were available.

The review followed PRISMA 2020 guidelines. Risk of bias was assessed using the Cochrane RoB 2 tool. A meta-analysis was conducted using a random-effects model with Review Manager (RevMan) 5.4 software. Subgroup analysis was planned based on intervention type, duration, and participant health status where data allowed.

TABLE I
SUBJECT CHARACTERISTICS

Sample size	**2966**			
Characteristic	**Mean**	**Median**	**Min**	**Max**
Age (yrs)	65.3	68.5	50.6	77.1
Height (cm)	153.5	153.4	145.8	168.7
Weight (kg)	66.9	65.6	56.3	97
BMI (kg/m2)	28.4	27.9	26.5	34.1

Figure 1 indicates the map that shows the geographic origin of the 8 studies included in this systematic review. Colour intensity reflects the number of studies per country (scale 1–3).

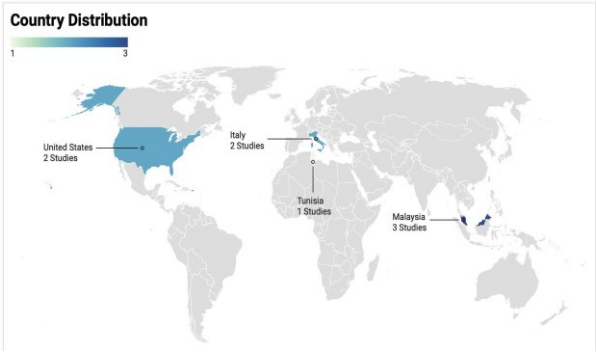

Fig. 1 shows an example of an image with country distribution. Check the country distribution to reveal the important detail in the figure.

III. Results and Discussion

A. Intermittent Fasting and Cognitive Function

Five studies assessed IF and cognition in adults aged 45+. IF showed modest improvements in memory, attention, and executive function, especially in those with metabolic issues or mild impairment [3]. However, short durations, small samples, and protocol variability limited robustness. Effects were more evident in short-term trials using alternate day fasting or 5:2 approaches.

B. Time-Restricted Eating and Cognitive Function

Four studies evaluated TRE and cognitive function. TRE yielded mild improvements in attention and processing speed, particularly among participants with obesity or metabolic syndrome [4]. Most studies were observational and used brief interventions, limiting causal inference. Variability in TRE timing and assessment tools also hindered direct comparisons across studies [5].

C. IF and TRE on Depression, Stress, and Mood

Six studies examined psychological outcomes. Both IF and TRE reduced depression and stress, enhancing mood and well-being. IF demonstrated slightly stronger, more consistent benefits likely due to metabolic and hormonal responses. TRE effects were present but less robust, suggesting that protocol intensity and metabolic shifts may influence psychological outcomes [6].

IV. Conclusions

Intermittent fasting and time-restricted eating may offer cognitive and psychological benefits for middle-aged and older adults. IF showed slightly stronger effects. However, methodological limitations and variability across studies warrant cautious interpretation and underscore the need for larger, longer, and more standardized trials in this population.

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