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Feeding Patterns with Circadian Misalignment and Their Relationship with Lipid and Glycemic Metabolic Responses in Healthy Adults

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INTRODUCTION & AIM

The circadian system regulates key metabolic functions through synchronization between the central clock and peripheral clocks in tissues such as the liver, muscle, and pancreas. Its misalignment—caused by behaviors such as night-shift work, late meals, or insufficient sleep—alters glucose and lipid metabolism, promoting metabolic dysfunction and increasing cardiometabolic risk. Time-restricted eating (TRE) has been shown to improve glycemic and lipid parameters by resynchronizing circadian rhythms and reducing the risk of metabolic diseases. Figure 1 illustrates the relationship between sleep, diet, and health.

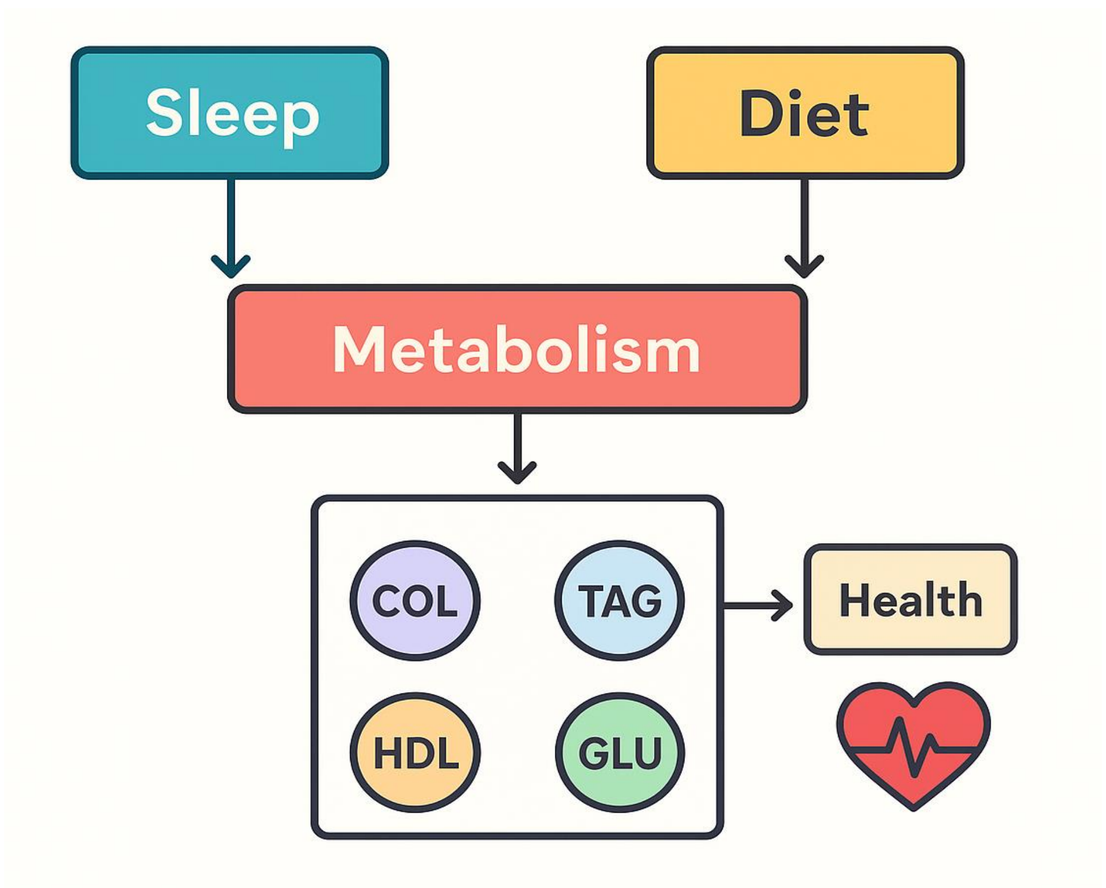

Fig 1. Relationship between sleep, diet and health

This study aimed to evaluate the association between feeding patterns with circadian misalignment (misalignment between food intake timing and biological/sleep phase) and lipid and glycemic metabolic responses in healthy adults attending nutritional counseling.

METHOD

Data were collected from 21 healthy adults aged 18–65 years, excluding pregnant women and individuals with chronic diseases.

During nutritional counseling, dietary intake data were collected through a R24 food history, sleep schedules, and food consumption records, and laboratory data were obtained from the clinical history.

Lipid profile and glycemia were analyzed using *Stata* with Pearson correlation coefficients.

Keywords: chronic jetlag; circadian clock; short-chain fatty acids; time-restricted feeding, Meal timing, Metabolic disorders.

RESULTS & DISCUSSION

Correlations were evaluated between metabolic parameters (total cholesterol, HDL, LDL, triglycerides, and blood glucose), sleep patterns (bedtime, wake-up time, hours of sleep), and dietary habits (number of meals per day). The analysis was performed using Pearson's correlation coefficient. Figure 2 shows the relationship between the parameters.

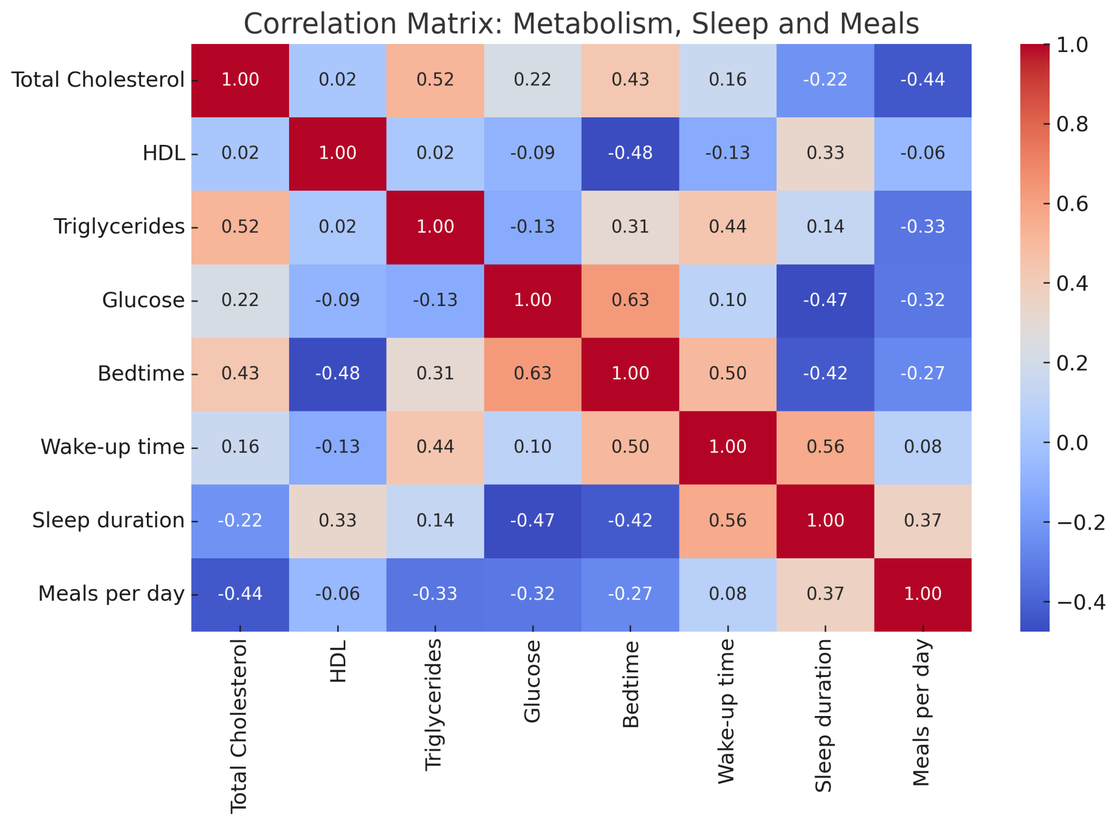

Fig 2.correlation Matrix: metabolism, sleep and meals

Correlations between metabolic parameters (glycemic and lipid), sleep patterns, and eating habits were assessed. Later sleep onset was associated with higher glycemia (r = 0.63), total cholesterol (r = 0.43), and triglycerides (r = 0.31), as well as with lower HDL concentrations (r = -0.48). A greater number of sleep hours was associated with a healthier metabolic profile: lower glycemia (r = -0.47) and higher HDL (r = 0.33). Lower meal frequency per day was associated with higher total cholesterol (r = -0.44), triglycerides (r = -0.33), and glycemia (r = -0.32).

CONCLUSION

Sleep timing and duration, as well as regularity of food intake, are associated with glycemic and lipid profiles. Late bedtimes, short sleep duration, and skipped meals are linked to poorer metabolic control.

FUTURE WORK / REFERENCES

Develop more specific time-restricted feeding (TRF) windows based on chronotype and nutrient intake.

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