

CIRCADIAN RHYTHM, NUTRITION AND METABOLISM

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Circadian rhythms, such as sleep-wake cycle, body temperature and eating behavior are regulated both centrally and peripherally by the biological clock located in the suprachiasmatic nucleus of the hypothalamus.

This study aims to clarify the importance of circadian rhythms related to Nutrition and Metabolism. It also demonstrates the effect of aging on circadian rhythms and how those changes can affect the quality of life and cause the onset of certain metabolic diseases.

We thus did a systematic review of the scientific literature. Eighty-nine scientific research papers published between 2000 and 2014 were obtained from the following databases: *Pubmed*, *Sciencedirect* and *SciELO*; and over 40 scientific articles were achieved by manual search.

From the articles analyzed it was demonstrated that light is the main synchronizer of the biological clock; and diet has an important role in synchronizing circadian rhythms through regular mealtimes and type of food consumed. Food is not just a good synchronizer of the biological clock; it is also an important mean in preventing certain diseases. Thus, delays on food intake's circadian rhythms have been associated with night eating syndrome and binge eating disorder. A desynchronization of the biological clock causes important changes in metabolism and is linked to the onset of certain diseases, which can be observed, for example, in shift workers. In addition, as a consequence of a disruption on the normal sleep-wake cycle such as jet lag, appetite and satiety might be modified because of hormonal alterations (abnormal levels of leptin and ghrelin, for example). Therefore, changes on circadian rhythms can trigger many diseases in which food intake plays an important role, such as cancer, obesity or metabolic syndrome.

A better understanding of the circadian system and its influence on biological processes will add a new dimension for the prevention and treatment of several diseases.

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