Assessment Of Hemoglobin Content And Sleep Duration In Vegetarians, And Non-Vegetarians

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Abstract:

Background: The diet pattern and level of hemoglobin are associated with the risk of the development of cardiovascular diseases. There are studies that explain the relationship between diet patterns and sleep. It is also said that there is an association between lack of sleep and obesity.

Aim and objectives: The present study was undertaken to observe the hemoglobin content and sleep duration in vegetarians, and non-vegetarians.

Materials and methods: All first-year Medical students were part of the study. Out of 150 students, Both males and females were part of the study. Unwilling students were excluded from the study. Hemoglobin in the blood samples was assessed using Sahli's acid hemocytometry method which is a standard method in hematology. Diet pattern and sleep duration was assessed by personal interview method with the participants.

Results: The mean weight of the participants is 60.24 kgs. The mean height of the participants is 164.3 cm. 44.9% of the participants were non-vegetarians. 50.6% of the participants sleep more than 6 hours. 90.8% of the participants do not use nutritional supplements. Both vegetarians and nonvegetarians have normal hemoglobin values. In comparison, non-vegetarians have higher levels of hemoglobin percentage.

Conclusion: The study results are in accordance with earlier studies as we have observed higher hemoglobin in the non-vegetarians. The sleep duration was also high in the non-vegetarians. Further detailed studies are necessary for this area.

Keywords: Sleep duration, Nutrition, Students.

Introduction:

The diet pattern and level of hemoglobin are associated with the risk of the development of cardiovascular diseases. There is a distinction in the diet patterns in India with wide cultural background. Vegetarians are those who consume only plant products whereas eggetarians ass eggs to them. The vegetarian diet was reported to be adopted in any age group.[1]Non-vegetarians are those who consume meat in their diet. In India, most of the population are non-vegetarians and the hemoglobin percentage was better in them. Iron is the most important constituent of hemoglobin. Lack of iron content in the food leads to anemia which is a major concern throughout the world. Earlier studies reported that consuming a nonvegetarian diet is associated with the development of the diseases like hypertension, cardiovascular diseases, etc.[2]At the same time, a vegetarian diet offers protection from these diseases.[3]The reason is that a vegetarian diet consists of all the nutrient elements in appropriate amounts. Sleep is essential for the homeostasis of an individual.[4] There are studies that explain the relationship between diet patterns and sleep. It is also said that there is an association between lack of sleep and obesity.[5,6]However, the related studies in this area are sparse. Hence, the present study was undertaken to observe the hemoglobin content and sleep duration in vegetarians, and non-vegetarians.

Materials and methods:

Study design: Cross-sectional study

Study participants: All first-year Medical students were part of the study. Out of 150 students, Both males and females were part of the study. Unwilling students were excluded from the study.

Assessment of hemoglobin: Hemoglobin in the blood samples was assessed using Sahli's acid hemocytometry method which is a standard method in hematology. All the assessments were performed at the hematology lab of the department. All parameters were recorded between 10-11 am for the convenience of the participants and to avoid diurnal variations.

Assessment of diet pattern and sleep duration: Diet pattern and sleep duration was assessed by personal interview method with the participants.

Statistical analysis: The data was analyzed using SPSS 20.0 version. Student t test was used for observing the significance of differences between the groups. Qualitative data were presented as frequency and percentage.

Ethical considerations: The study was approved by the institutional human ethical committee.

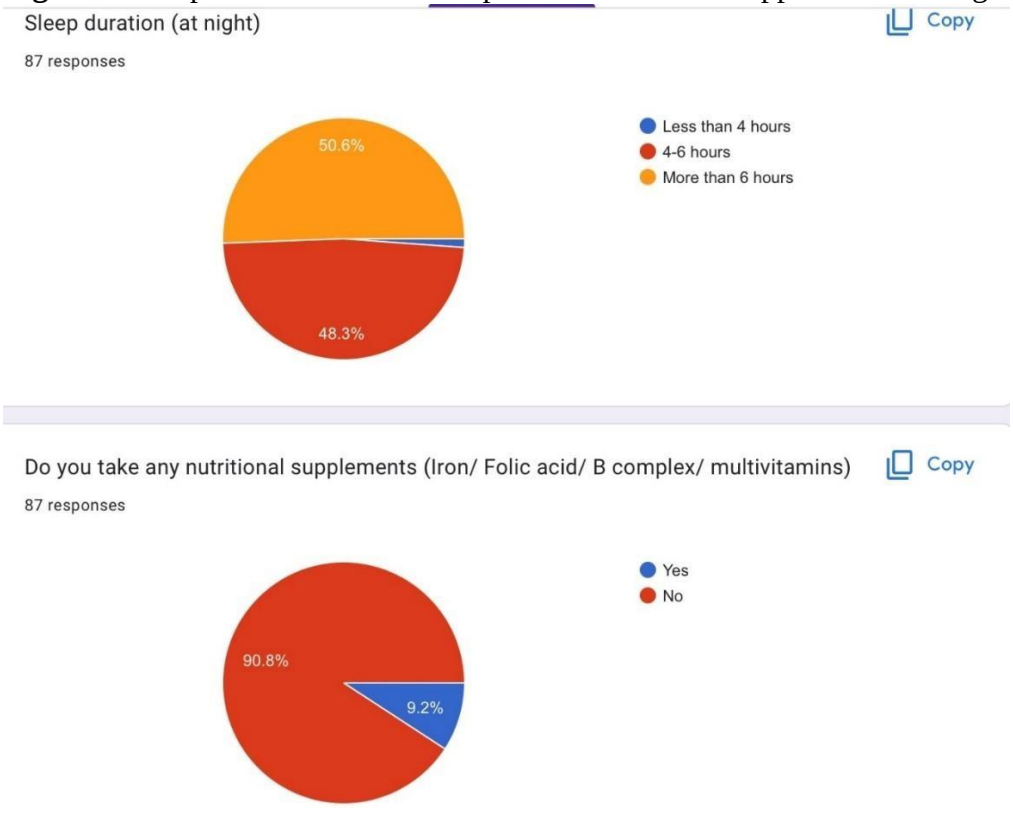
Results:

The mean weight of the participants is 60.24 kgs. The mean height of the participants is 164.3 cm. Figure 1 presents the diet pattern of the participants. 44.9% of the participants were non-vegetarians. Figure 2 presents the sleep duration and consumption of nutritional supplements among the participants. 50.6% of the participants sleep more than 6 hours. 90.8% of the participants do not use nutritional supplements. Table 1 presents the hemoglobin levels in vegetarians and nonvegetarians. Both vegetarians and nonvegetarians have normal hemoglobin values. In comparison, non-vegetarians have higher levels of hemoglobin percentage.

Figure 1: Diet pattern of the participants

Data was expressed as a percentage

Figure 2: Sleep duration and consumption of nutritional supplements among the participants



Data was expressed as a percentage

Table 1: Haemoglobin levels in vegetarians and nonvegetarians

Variable	Vegetarians	Nonvegetarians	P value
Hb level (gms%)	12.938±0.255	13.882±0.258	0.0116*

Data were presented as mean and SEM

Discussion:

Consumption of a vegetarian diet has multiple benefits. It was reported that individuals who consume a vegetarian diet have a low incidence of heart disease**.**[7,8]Further, the body mass is also less in vegetarians when compared to their counterparts. Though there are some advantages still vegetarians may get deficient in certain nutrients like vitamin B12 and iron.[9]The amount of iron available in the plant products is comparatively less. Hence, this may cause the individual to develop iron deficiency anemia.[10]The earlier studies that compared the ferritin levels in males and females reported ambiguous results.[11,12]

The present study does not compare the values in male and female participants separately as it is not our objective. It was reported that vegetarians and non-vegetarians both have similar incidences of the development of iron deficiency anemia. In our study, we observed normal hemoglobin values in both vegetarians and non-vegetarians. Sleep duration has been linked with food intake**.**

When the individual has less duration of sleep, this will cause an increase in the hunger sensation and an increase in the food intake and leading to obesity.[14-16] Plant product consumption was reported to have beneficial effects on sleep and prevents obesity.[17] In contrast to this we have observed better sleep duration in non-vegetarians. However, we have not observed the sleep quality. Only the duration of sleep was collected.

Conclusion:

The study results are in accordance with earlier studies as we have observed higher hemoglobin in the non-vegetarians. The sleep duration was also high in the non-vegetarians. Further detailed studies are necessary for this area.

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Author's contribution:

1. A Study on Clinical Profile and Outcome of Intermediate Syndrome In patients With Acute Organophosphate Poisoning
2. Knowledge, attitude, and practice of health-care ethics among doctors in Tamil Nadu – A cross-sectional study

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References:

1. Dietary Guidelines for Americans. United States of America: USDA Center for Nutrition Policy and Promotion. 2015–2020.

2. Acosta-Navarro, J. C., Prado, S. M. C., Sanchez E. T., Escobedo, D., & Pineda, Z. Blood pressure, lipid profile and other biochemical parameters among vegetarians, semi-vegetarians and omnivores Peruvians. The Lima Study. An Paul Med Cir. 1998;125: 87-101.

3. McEvoy, C. T., Temple, N., & Woodside, J. V. Vegetarian diets, low-meat diets and health: a review. Public health nutrition.2012; 15(12), 2287-2294.

4. Colten HR, Altevogt BM. Sleep disorders and sleep deprivation: an unmet public health problem. Washington (DC): The National Academic Press; 2006. p. 33–54.

5. Patel SR. Reduced sleep as an obesity risk factor. Obes Rev 2009;10(Suppl. 2):61–68.

6. Patel SR, Hu FB. Short sleep duration and weight gain: a systematic review. Obesity (Silver Spring) 2008;16(3):643–653.

7. Kahleova H, Pelikanova T. Vegetarian diets in the prevention and treatment of type 2 diabetes. J Am Coll Nutr. 2015;34:448-458.

8. Pawlak R. Is vitamin B_{12} deficiency a risk factor for cardiovascular disease in vegetarians? Am J Prev Med. 2015;48:e11-e26.

9. Waldmann A, Koschizke W, Leitzman C, Hahn A. Dietary iron intake and iron status of German female vegans: results of the German vegan study. *Ann Nutr Metab*. 2004;48:103-108.

10. Institute of Medicine. Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. http://www.nap.edu/download.php?record_id=10026. Accessed Dec 15, 2022.

11. Faber E, Benade J, Labadarios D. Anthropometric measurements, dietary intake and biochemical data of South African lacto-ovovegetarians. *South Afr Med J*. 1986;69:733-738.

12. Haddad H, Berk S, Kettering D, Hubbard W, Peters R. Dietary intake and biochemical, hematologic, and immune status of vegans compared with nonvegetarians. *Am J Clin Nutr*. 1999;70:586s-593s.

13. Craig WJ, Mangels AR; American Dietetic Association. Position of the American Dietetic Association: vegetarian diets. J Am Diet Assoc. 2009;109:1266-1282.

14. Markwald RR, Melanson EL, Smith MR, Higgins J, Perreault L, Eckel RH, et al. Impact of insufficient sleep on total daily energy expenditure, food intake, and weight gain. Proceedings of the National Academy of Sciences of the United States of America. 2013;110(14):5695–700.

15. Nedeltcheva AV, Kilkus JM, Imperial J, Kasza K, Schoeller DA, Penev PD. Sleep curtailment is accompanied by an increased intake of calories from snacks. The American journal of clinical nutrition. 2009;89(1):126–33.

16. Spaeth AM, Dinges DF, Goel N. Effects of experimental sleep restriction on weight gain, caloric intake and meal timing in healthy adults. Sleep. 2013;36(7):981–90.

17. St-Onge MP, Crawford A, Aggarwal B. Plant-based diets: Reducing cardiovascular risk by improving sleep quality? Curr Sleep Med Rep. 2018 Mar;4(1):74-78.