Original Article

Observation of various Demographic, Socio-economic and Physical Factors with *Sthaulya* (Obesity) in Individuals Preferring Day Sleep: A Cross Sectional Survey

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Abstract

Background and Aim: Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. Ayurveda has emphasized that the sleep pattern of the individual is equally responsible for obesity alike food. The aim of this study is to identify the association between day sleep and *Sthaulya* (Obesity) among patients aged between 20 and 60 years. **Methods:** A cross-sectional survey study was conducted among 250 *Sthaulya* (obesity) patients visiting the outpatient department. Sleep pattern questionnaire was used for the survey study. **Results:** The survey study revealed that habit of sleeping during daytime for more than 1 h, especially just after having lunch, waking up late after 6 AM in the morning, and sleeping for more than 8 h in a day is the important factors associated with *Sthaulya* (obesity). **Conclusion:** To prevent obesity, sleep after lunch and getting-up late in the morning should be avoided.

Keywords: day sleep, obesity, *Sthaulya*

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Introduction

Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. The last two decade of the previous century has witnessed dramatic increase in health-care cost due to obesity and related issues.[1] The prevalence of obesity is increasing in most part of the world and affecting men, women, and children. Furthermore, obesity is no longer just a concern for developed countries, but it is becoming cumulative problem in many developing countries and affecting the people of all socioeconomic groups. Intake of high calorie-rich diet and physical inactivity which create imbalance between the energy intake and expenditure are well-known factor for the gaining weight and obesity.[1] Although there is evidence to prove the relationship between sleep and obesity, sleep habits of the obese person is still not being given much importance while considering its etiology and management.

The earliest Ayurveda text Charaka Samhita, which is the work considered to be written during the 5th Cent. B.C.[2] in the context of *Sthaulya* (obesity) has emphasized the food and sleep as the two key factors responsible for the *Sthaulya* (obesity).[3] Recent evidence also proved that obesity is a factor consistently linked to daytime sleepiness[4] and obese patients are more likely to report daytime sleepiness than nonobese people.[5] In this context, the present study was undertaken to know the association between day sleep and *Sthaulya* (obesity) among the patients aged between 20 and 60 years visiting to the Outpatient Department (OPD) of IPGT and RA (Institute of Postgraduate Teaching and Research in Ayurveda), Jamnagar, Gujarat, India.

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Materials and Methods

Participants and study design

A cross-sectional survey study was conducted among 250 *Sthaulya* (obese) individuals visiting the OPD of the

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institute from May 2013 to June 2014. The patients were selected using simple random sampling. Ethical clearance was obtained for this study from the Institutional Ethics Committee (Ref. PGT/7-A/Ethics/2012-2032/3552 dated 25/02/2013) and this study was also enrolled in Clinical Trial Registry of India (CTRI) vide CTRI/2013/09/004028 (Registered on: 27/09/2013) – Trial Registered Retrospectively. To fulfill the aims and objectives, a sleep pattern questionnaire was prepared and used in this study. All participants were interviewed in their regional language, each question was explained properly to the participants, and the response was noted in the survey questionnaire by a single person. Written informed consent was taken from patients as per the Helsinki declaration after offering adequate explanation about the study and its aims.

Inclusion criteria

- Apparently, healthy obese individuals *(Sthaulya)* (obesity with >25 body mass index (BMI) of age group 20–60 years who had no confirmed physical and mental illness were selected without any bar of age, sex, cast, religion, occupation, economic status, and gender, attending the OPD of the institute were included in this study.

Exclusion criteria

- Patients having age <20 years and >60 years
- Pregnant women and lactating mothers
- Known case of diabetes, severe hypertension, cardiovascular disease, hemiplegic, chronic obstructive pulmonary disease, malignancies, acquired immune deficiency syndrome, known cases of tuberculosis, psychiatric patients, and obesity due to known hormonal imbalances were excluded from the study.

Results

Observations related to principle variables, namely, age, gender, education, occupation, socioeconomic status, family history, chronicity of disease, BMI and sleep pattern which include habit of day sleep, duration of day sleep, duration of sleep in 24 h, and morning waking up time are depicted in Tables 1 and 2.

Table 1: Baseline characteristics of patients and body mass index, chronicity, and family history (*n*=250)

Character	Categories	Number of patients (%)
Age (years)	20-30	86 (34.4)
	31-40	87 (34.8)
	41-50	53 (21.2)
	51-60	24 (9.6)
Gender	Male	42 (16.8)
	Female	208 (83.2)
Religion	Hindu	202 (80.8)
	Muslim	39 (15.6)
	Sikh	1 (0.4)
	Christian	1 (0.4)
	Jain	7 (2.8)
Marital status	Married	218 (87.2)
	Unmarried	31 (12.4)
	Widow (er)	1 (0.4)
Education	Uneducated	19 (7.6)
	Primary	76 (30.4)
	Secondary	86 (34.4)
	Higher secondary	8 (3.2)
	Graduate	43 (17.2)
	Postgraduate	18 (7.2)
Occupation	Homemaker	176 (70.4)
	Business	20 (8)
	Government employee	7 (2.8)
	Private sector employee	26 (10.4)
	Others	21 (8.4)
Socioeconomic status	Poor	33 (13.2)
	Middle	123 (49.2)
	Upper middle	76 (30.4)
	Rich	18 (7.2)
BMI (kg/m^2)	25-29.9	85 (34)
	30-34.9	114 (45.6)
	35-39.9	42 (16.8)
	>40	9 (3.6)
Chronicity (years)	<2	35 (14)
	2-5	78 (31.2)
	>5	137 (54.8)
Family history	Paternal	53 (21.2)
	Maternal	97 (38.8)
	Negative	122 (48.8)

BMI: Body mass index

Discussion

The present cross-sectional study was carried in the OPD of the institute's hospital. Total 250 obese patients (*Sthaulya*) were surveyed to determine the association of day sleep with the *Sthaulya* (obesity). Obesity is an intricate, multifactorial chronic disease.

Age, gender, and education

In the present study, it was observed that majority of the patients (69.2%) were between 20 and 40 (20–30 years (34.4%) and 31–40 years (34.8%) years of age group. Sedentary lifestyle is prevailing among the younger generation. Day sleep becomes routine habit of youth after crossing their schooling. Out of 250 patients surveyed, 208 (83.2%) were female. The report published by the National Family Health Survey also revealed that in Gujarat state, the percentage of female who are overweight or obese is higher in comparison to male.[6] In the present study, maximum patients, i.e., 92.4% were educated but in that only 17.2% were graduates, 7.2% were postgraduates, 34.4% were educated at secondary level, and 30.4% were educated only at primary level. These data indicate that low educational status is related with the unhealthy lifestyle pattern. Not continuing the study after the school education, especially in case of female, will bring pause in their active life and day sleep may become a routine habit, contributing to weight gain and obesity [Table 1].

Table 2: Observations on sleep pattern (*n*=250)

Factors	Categories	Number of patients (%)
Sleep in daytime	>5 days in a week	89 (35.6)
	3-4 days in a week	62 (24.8)
	1-2 days in a week	38 (15.2)
	Less than once in a week	46 (18.4)
	Never	15 (6)
Sleep immediately after food in daytime	>5 days in a week	83 (33.2)
	3-4 days in a week	64 (25.6)
	1-2 days in a week	42 (16.8)
	Less than once in a week	46 (18.4)
	Never	15 (6)
Duration of day sleep	1-2 h	189 (75.6)
	2-3 h	41 (16.4)
	>3 h	5 (2)
	No day sleep	15 (6)
Sleep >8 h in 24 h	>5 days in a week	2 (0.8)
	3-4 days in a week	24 (9.6)
	1-2 days in a week	77 (30.8)
	Less than once in a week	127 (50.8)
	Never	20 (8)
Normally wake up before 6.00 AM	>5 days in a week	3 (1.2)
	3-4 days in a week	35 (14)
	1-2 days in a week	69 (27.6)
	Less than once in a week	142 (56.8)
	Never	1 (0.4)

Occupation, socioeconomic status, body mass index, chronicity, and family history

Majority of the patients (70.4%) in this study were homemakers followed by private sector employees (10.4%). Usually, homemakers have the responsibility of caring for other family members, and because of this, they are less caring about their own health needs. Afternoon will be usually the leisure time for them and they develop habit of sleeping in daytime. In the present study, it was found that maximum numbers of patients (79.6%) belong to middle socioeconomic status. This is because obesity is related with faulty lifestyle including diet and sleep habits and not specifically with the income and socioeconomic status. In our study, 45.6% of patients were having BMI between 30 and 34.9, 34% of patients were having BMI between 25 and 29.99, 16.8% of patients were having BMI between 35 and 39.9, and 3.6% of patients were having BMI >40. Recent survey study has also proved the association of elevated BMI level with longer sleepers among the middle age group people.[7] While analyzing the chronicity of the disease, it was found that 54.8% of patients were having chronicity >5 years, 31.2% of patients were having chronicity in between 2 and 5 years, and 14% of patients were having chronicity <2 years. This shows that maximum patients were having the habit of day sleep for a longer period. In the present study, 51.2% of patients were having positive familial history and 48.8% of patients were having negative familial history of obesity. The children usually adopt the lifestyle pattern of their parents so if the parents are obese, the chances of children to be obese become more. However, it is also true that some individuals with a genetic tendency may avoid obesity by maintaining healthy eating pattern and physical activity behaviors.[8,9] Aspects of the social home environment, including caregiver modeling and policies toward healthy eating and physical activity, are also important influences in case of obesity.[10,11] It was also observed that 48.8% of patients were having the negative family history, which clearly indicates that our own lifestyle habits and sleep pattern are mainly responsible for the weight gain and obesity [Table 1].

Daytime sleep pattern

Like proper diet, proper sleep is also essential for the maintenance of the health. Corpulence and emaciation are specially conditioned by proper and improper sleep and diet.[3] Ayurveda texts have clearly mentioned day sleep as the cause of *Sthaulya* (obesity).[12,13] In the present study, it was found that 35.6% of patients almost always sleep in daytime and 24.8% 3–4 days in a week. Most of these patients go to day sleep immediately after having lunch. Such sleeping habit is unhealthy and found as a strongly associated with *Sthaulya*. It was reported that 33.2% of patients >5 days in a week go to day sleep immediately after having the food, 25.6% of patients reported for 3–4 days in a week and 18.4% less than once in a week. Sleeping during daytime immediately after having food is the cause of vitiation of *Mamsavaha* (channels carrying components of muscle tissue) and *Medovaha Sroto* (channels carrying adipose tissue), which are involved in the pathogenesis of *Sthaulya* (obesity).[14] Maximum number of the patients (75.6%) were having the habit of sleeping in daytime for 1–2 h in a day, 16.4% were having the habit of sleeping in daytime for 2–3 h, and 2% were sleeping in the daytime for >3 h. Empirical evidence suggests a strong association between habitual sleep duration and obesity.[7] Normally, for a healthy adult, 6–8 h of night sleep is recommended and that is enough to get good rest. Sleeping >8 h is not good for health as it leads to weight gain and obesity. In this survey study, only 8% of patients reported that they never sleep >8 h in 24 h, whereas 9.6% 3–4 days in a week, 30.8% sometimes and 50.8% rarely sleep for >8 h in 24 h. The evidence that long sleep is associated with obesity has consistently been found even stronger than the associations with short sleep.[15-17] Waking up early morning is recommended as good practice for maintaining health and longevity.[18] In the present survey, most of the patients (56.8%) reported that they rarely wake up before 6 AM and they like to sleep for longtime. Day sleep can be considered as sleeping anytime during day after the sunrise. Obesity is caused due to the metabolic disturbances and the study also suggests that daytime sleepiness in obesity leading to hyperarousal at night and hypoarousal during the day. This was based on the observations that obese patients have shorter sleep latencies and maintain sleep more effectively during the day but have difficulty falling asleep and maintaining sleep at nighttime.[19,20]

Limitations of the study

The present survey study has not assessed the difference between individuals preferring daytime sleep and those not preferring daytime sleep. In this study, only the percentage of collected data was calculated and no other statistical analysis was performed.

Conclusion

In the present study, the baseline characteristics show that majority of obese patients were belonging to middle age group and it is due to the increasing trend of sedentary lifestyle among new generation. Positive familial history indicates that our social and family environment influences our lifestyle and sleep habits which are associated with the obesity. Maximum patients were having habit of day sleep for >1 h each day, they were sleeping immediately after having the afternoon food, the morning wake-up time was also after the sunrise that is after 6.00 AM, most of the patients reported that they sleep for >8 h in 24 h. All these factors clearly suggest that daytime sleep is strongly associated with weight gain and obesity. For the prevention and effective management of obesity, along with diet and physical activities, it is very important to consider the individual's sleep habits.

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Conflicts of interest

There are no conflicts of interest.

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