

## NUTRITIONAL STATUS OF AGRAWAL ADULT MEN: A COMPARISON BETWEEN BUSINESS CLASS AND SERVICE CLASS

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### ABSTRACT

**Introduction:** Agrawal community is a trader's community and majority of adult men are having their own business. Because of prosperity and sedentary lifestyle they are more prone to obesity. They follow a diet rich in fried and fatty foods, celebrate every festival and enjoy fried and fatty foods during these festivals. Exchange of sweets is commonly practiced on every special occasion.

**Objective:** The present study was therefore, an attempt to study the nutritional status of Agrawal adult men.

**Methodology:** The study was carried out on 200 men (35-60 years; 100 service class and 100 business class) selected using stratified random sampling technique. Obesity was assessed using body mass index(BMI) and waist to hip ratio(WHR). Data on food consumption pattern were collected using 24 hours dietary recall method for three consecutive days. Data on tobacco consumption, alcohol intake, family history of diseases and personal medical history were also recorded.

**Results and conclusion:** The results of the study revealed that mean BMI was found to be higher in business class (31.5%) as compared to men doing service (27.4%). The mean WHR in both groups was more than desirable (0.96 and 0.97, respectively). Business class (87.5%) was more overweight than service class (65.0%). Results also revealed a positive correlation between BMI and WHR. Diet survey revealed that intake of energy and protein was slightly lower than recommended dietary allowances (RDA). Energy contribution of fat to total energy was found very high while that of carbohydrates was low. Energy and fat intake was found higher in business class as compared to service class. Alcohol and tobacco consumption was not so common in Agrawals. Prevalence of risk factors of cardiovascular diseases was higher in business class men as compared to service class men of Agrawal community.

**Key Words:** Food consumption pattern, Alcohol and tobacco consumption, Waist-Hip ratio, 24 hours diet recall, Body mass index

## INTRODUCTION

The prevalence of obesity is rapidly increasing in India and other South Asian countries, leading to increased mortality and morbidity due to cardiovascular disease and type-2 diabetes (Prasad et al., 2011). Asian Indians have long been considered susceptible for both metabolic syndrome and cardiovascular disease, which has instigated a number of studies on Indians living in India (Kanjilal et al., 2008).

Health related lifestyle behavior includes dietary habits, and tobacco and alcohol consumption affects the overall wellbeing of a person. Technological advancement, modernization, westernization, urbanization, easy access to food products, improvement in socio-economic status, improved communication facilities etc. have adversely affected lifestyle. Ready to eat calorie dense foods, convenience foods, junk foods have taken a major position in daily diet. Physical activity has reduced due to use of labor saving devices, use of motor driven vehicles for mobility, eating out, celebrating of festivals and social get togethers. Junk food, alcohol, and sedentary lifestyle are making one in every five Indian men and women either obese or overweight (Sharma, 2014).

Community specific cardiovascular disease risk factor studies may be worthwhile to evaluate hereditary versus environmental causes. Agarwal community is an affluent business community in India. Most of people engaged in business spend their time while sitting and leading to sedentary lifestyle. Agarwals living in Jaipur are traditional and celebrate many festivals and get together frequently and consume energy dense food during these festivals. Agarwals prefer pure milk high fat diet. Exchange of sweets is common. Thus, the present study was planned to assess the nutrient intake and occurrence of obesity among Agarwal men (service and business class). The study was designed with the following objectives-

1. to assess prevalence of obesity among adult Agrawal men.
2. to assess behavior related to tobacco consumption and alcohol intake among Agrawal men.
3. to study the food consumption pattern and nutrient intake in Agrawal adult men.

4. to find family history of cardiovascular diseases, hypertension and diabetes among Agrawal, and.
5. to compare family disease history, occurrence of obesity, and nutrient intake among Agrawal adult men from business class and service class.

## **METHODOLOGY**

The study was carried out on 200 adult Agrawal men aged 35-60 years residing in Jaipur since more than 20 years, randomly selected from four different areas of Jaipur city. Out of the total, one hundred respondents were engaged in business and one hundred were from service class. Stratified random sampling technique was used. Details of “Agrawal Samaj Upsamities” were obtained from main Agrawal Samaj Samiti offices. Five upsamities within the reach of minimum 5 km from University of Rajasthan campus were selected and from each Upsamiti 20 adult males were selected using cluster sampling method. Only those respondents who were willing to participate in study were included. Respondents having cancer and terminal heart diseases were excluded.

A self-prepared structured questionnaire was used. The questionnaire consisted of general information including personal profile and family profile, family history of degenerative diseases and personal history of degenerative diseases. Anthropometric measurements such as weight, height, waist circumference and hip circumference and were recorded using standard techniques. BMI and WHR were calculated. Weight was recorded using bathroom weighing balance. Height was measured using heightometer, and non-elastic, non-stretchable measuring tape was used for waist and hip circumference. Blood pressure was measured using digital sphygmomanometer. Dietary intake was recorded using 24 hours dietary recall for 3 consecutive days. Before data collection, an informed consent was obtained from respondents.

## **RESULTS AND DISCUSSION**

Age wise distribution of respondents revealed that 20.0% men were aged 35-40 years while 23.2%, 21.2%, 13.7% and 21.2% men were aged 41-45 years, 46-50 years, 51-55 years, 55-60 years, respectively. The distribution of respondents in various age categories was almost similar. Minimum educational level was secondary. Ten percent

men were educated up to secondary level where as 35% respondents (service class 32.4% and business class 37.5%) were graduates.

### **Tobacco and alcohol consumption**

The data in Table 1 indicated that consumption of tobacco and alcohol was not a common practice in Agrawal community as only 7.5% Agrawal men were consuming tobacco in the form of chewing out of which 2.5% were both chewer and smoker. Only 1% respondents were consuming alcohol.

Results of the study are in line with the findings of previous study on north Indian Agrawal community (Gupta and Agrawal, 2009).

**Table 1: Distribution of subjects according to the consumption of tobacco and alcohol**

	<b>Frequency of Service class men (n= 100)</b>	<b>Frequency of Business class men (n= 100)</b>	<b>Frequency of Total men (n=200)</b>
<b>Tobacco</b>			
User	10 (10.0)	5 (5.0)	15 (7.5)
Non-user	90 (90.0)	95 (95.0)	185 (92.5)
<b>Other forms of tobacco</b>			
Chewer	10 (10.0)	0 (0.0)	10 (5.0)
Chewer and smoker	0 (0.0)	5 (5.0)	5 (2.5)
<b>Alcohol consumption</b>			
Non drinker	98 (98.0)	100 (100.0)	198 (99.0)
Drinker	2 (2.0)	0 (0.0)	2 (1.0)

Figures given in parentheses denote percentages.

### **Family history of chronic diseases**

Table 2 clearly revealed that more than half of the subjects (54.0%) had a positive family history of hypertension. Nearly half of the business class men had family history of coronary artery disease. Overall one fourth respondents had family history of diabetes, out of which 30.0% belonged to business class and 23.0% belonged to service class.

Similar results were found in a study conducted on north Indian Punjabi Bhatia community that nearly one fourth of the subjects were diabetic (Gupta et al., 2007). Family history of obesity was found more in business class (57.5%) as compared to service class (30.0%).

**Table 2: Family history of chronic diseases**

Type of Disease	Frequency of service class men (n= 100)	Frequency of business class men (n= 100)	Frequency of total men (n= 200)
Hypertension	40 (40.0)	68 (68.0)	108 (54.0)
CAD	28 (28.0)	48 (48.0)	76 (38.0)
Diabetes	23 (23.0)	30 (30.0)	53 (26.5)

Figures given in parentheses denote percentages.

### **Anthropometry**

**Height:** As shown in the Table 3, mean height of service class respondents was 167 ±6.63cm whereas it was 163±6.80 cm in business class respondents. The data of the present study showed that the studied population had short stature. Short stature has been positively correlated with increased prevalence of heart disease. Men that are taller (above 182 cm) have 35% less risk of heart disease as compared with short stature (below 167 cm) men (Hebert et al., 1993).

**Weight:** Mean weight of respondents from service class and business class was 77±13.35 kg and 84±13.15 kg respectively. Mean body weight was higher in business class compared to service class.

**Body Mass Index:** BMI was classified according to the new classification given by (WHO, 2004). Table 4 shows that respondents from service class and business class had a mean BMI of 27.4±4.80 and 31.5±5.49, respectively. This clearly stated that respondents of business class were heavier then service class males. The overall mean BMI was found to be higher than 23 and 25 as per the cut-off levels for Asian Indians as well as

international standards (WHO, 2004). Eighty five percent of the respondents were either overweight or obese. Obesity (BMI more than 30 kg/m<sup>2</sup>) was observed in 30.0% and 47.5% respondents from service class and business class respectively. Very high prevalence of overweight and obesity among Agrawal adults residing in Jaipur was reported by Dhabriya et al. (2015).

**Waist circumference:** As evident from the Table 5, business class Agrawal men had a very high waist circumference (96.0±12.46cm) as compared to the service class men (80.5±10.85cm). Similarly, Dhabriya et al. (2015) reported age adjusted central obesity as 61.2% among Agrawal adults residing in Jaipur.

**Waist Hip Ratio:** The mean WHR was more than desirable(>.9) in all the study subjects.

**Table 3: Mean values of anthropometric measurements of the respondents**

<b>Anthropometric Variables</b>	<b>Service class (n=80)</b>	<b>Business class (n=80)</b>	<b>Total (n=160)</b>
Height (cm)	167.0±6.63	163.0±6.80	165.0±6.71
Weight (kg)	77.0±13.35	84.0±13.15	80.5±13.25
BMI (kg/m <sup>2</sup> )	27.4±4.80	31.5±5.49	29.4±5.14
Waist Circumference(cm)	80.5±10.85	96.0±12.46	88.3±11.65
Hip Circumference (cm)	95.0±0.25	98.0±0.60	96.5±0.42
Waist- Hip Ratio	0.96±0.06	0.97±0.07	0.96±0.06

Mean±SD.

**Table 4: Frequency distribution of subjects according to BMI**

<b>BMI Groups</b>	<b>Nutritional status</b>	<b>Service-class men (n=80)</b>	<b>Business-class men (n=80)</b>	<b>Total men (n=160)</b>
<18.5	Underweight	2 (2.5)	0 (0.0)	2 (1.2)
18.5-22.9	Normal Range I	18 (22.5)	4 (5.0)	22 (13.7)
23-24.9	Normal Range II	8 (10.0)	6 (7.5)	14 (8.7)
25-29.9	Pre- Obese	28 (35.0)	24 (30.0)	52 (32.5)
30-34.9	Obese Class I	20 (25.0)	32 (40.0)	52 (32.5)
35-39.9	Obese Class II	4 (5.0)	8 (10.0)	12 (7.5)
< 40	Obese Class III	0 (0.0)	6 (7.5)	6 (3.7)

Figures given in parentheses denote percentages.

**Table 5: Frequency distribution of subjects according to waist circumference and waist hip ratio**

<b>Parameters</b>	<b>Categories</b>	<b>Service Class (n=80)</b>	<b>Business Class (n=80)</b>	<b>Total (n=160)</b>
WC	< 80	10 (12.5)	2 (2.5)	12 (7.50)
	80-89.9 cm	26 (32.5)	28 (35.0)	54 (33.75)
	> 90 cm	44 (55.0)	50 (62.5)	94 (58.75)
WHR	< 0.80	0 (0.0)	0 (0.0)	0 (0.0)
	0.80- 0.89	10 (12.5)	16 (20.0)	26 (16.25)
	0.90- 0.99	42 (52.5)	26 (32.5)	68 (42.50)
	> 1.0	28 (35.0)	38 (47.5)	66 (41.25)

Figures given in parentheses denote percentages.

## Blood pressure

Table 6 indicated that nearly one fourth Agrawal adult men were hypertensive. Similarly Dhabriya et al. (2015) in her study reported that 34% of Agrawal adults were suffering from hypertension. The mean value of blood pressure of respondents of service class and business class was 134/86 mmHg and 133/86 mmHg, respectively.

**Table 6: Prevalence of hypertension**

Status of hypertension	Service Class (n=100)	Business Class (n=100)	Total (n=200)
No history/ blood pressure $\leq$ 130/ 90 on test day	75 (75.0)	72 (72.0)	147 (73.5)
Hypertension history or blood pressure $\geq$ 130/90 on test day	25 (25.0)	28 (28.0)	53 (26.5)

Figures given in parentheses denote percentages.

## Nutrient intake

Results of diet survey revealed that intake of energy and protein was lower than recommended dietary allowances in both the groups. Table 7 indicates that carbohydrate intake was slightly high in service class respondents (158±51.45g) as compared to business class respondents (148±41.44g). Mean energy intake of business class respondents was higher than respondents of service class. BMI of business class respondents was significantly correlated with their diet and nutrient intake.

The mean protein and fat intake were nearly similar in both groups. Energy contribution of fat to total energy was found very high while that of carbohydrate was low. Energy intake was positively correlated with waist hip ratio in service class respondents while calcium, protein, fat and carbohydrate intake of business class respondents was found significantly correlated. Beta- carotene and niacin intake was lower whereas calcium and thiamine intake was higher than recommended dietary allowances in study subjects. Iron and vitamin C intake was lower than recommended dietary allowances in business class.



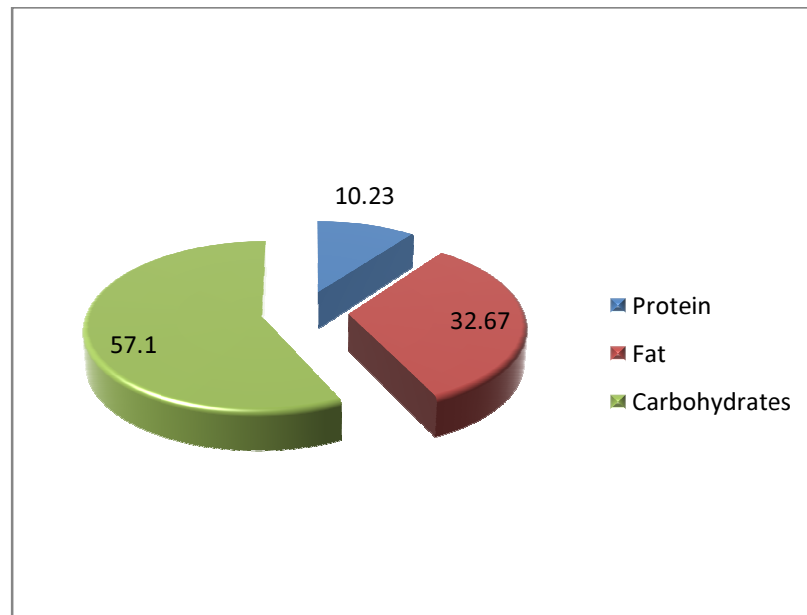
**Table 7: Average intake of nutrients by studied respondents**

<b>Nutrients</b>	<b>Mean intake of service class</b>	<b>Mean intake of Business class men</b>	<b>Mean intake of total men</b>
Protein	32.71±9.57	32.5±9.5	32.60±11.04
Fat	41.48±19.90	41.62±17.85	41.55±24.61
Carbohydrate	158.53±51.45	148.53±41.44	150.53±57.35
Energy	1176.6±345.40	1514.2±281.89	1345.4±397.37
Calcium	1058.8±737.14	885.89±1069.34	972.37±939.63
Iron	16.15±3.50	5.74±101.78	20.94±72.62
β-carotene	927.96±684.59	888.06±957.49	908.01±857.04
Thiamine	2.42±0.38	8.52±0.24	5.47±0.32
Riboflavin	1.25±0.17	1.40±0.25	1.32±0.24
Niacin	6.75±2.20	6.17±2.08	6.45±2.39
Vitamin C	43.42±46.77	35.5±32.61	39.46±40.06

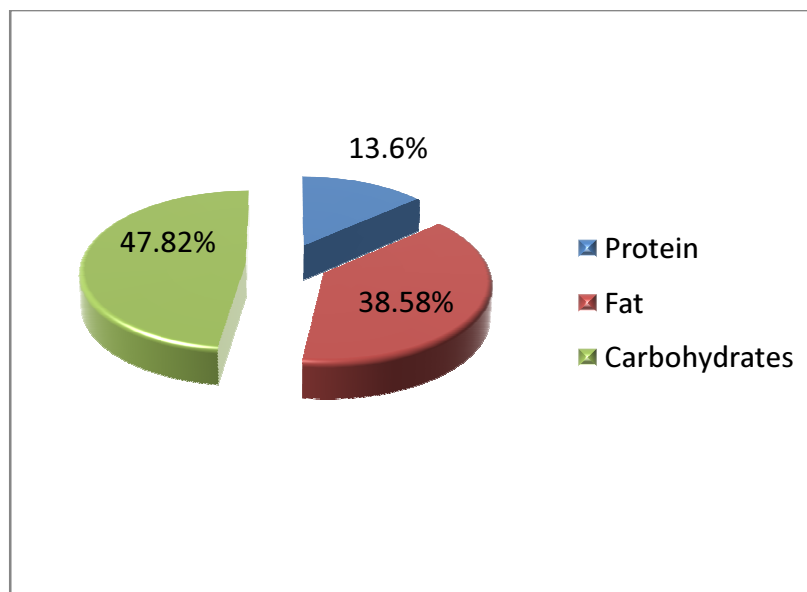
Mean±SD.

### **Contribution of macronutrients to total energy intake in respondents**

According to dietary guidelines for Indians, a balanced diet should provide 50-60% of total calories from carbohydrates, about 10-15% from protein, and 20-30% from both visible and invisible fat (NIN, 2011). As depicted in Fig. 1 and 2, contribution of protein in the total energy intake was in the ideal range whereas contribution of fat to the total energy was above the ideal range in both the study groups. The findings of the study were supported by a study which indicated higher consumption of fat and calories in both men and women of Agrawal community (Gupta and Agrawal, 2009). Contribution of fat to total energy was much higher in the business class men compared to service class men. Contribution of carbohydrate to total energy was in the ideal range (57.1%) in service class men whereas it was nearly to the ideal range in business class men.



**Fig. 1: Contribution of protein, fat and carbohydrates in service class men to total energy**



**Fig. 2: Contribution of protein, fat and carbohydrates in business class men to total energy**

## CONCLUSIONS

More than three fourth of Agrawal men studied were having BMI more than 25 and were either pre-obese or obese. The percentage of pre obese and obesity was higher in business men as compared to service men. Business men were at higher risk of cardiovascular problems than service men as business men were short, had more abdominal obesity, higher BMI, higher family history of disease, higher carbohydrate and fat intake compared to Agrawal service class men. Fat intake as well as contribution of fat to total energy was high in all the study respondents.

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