

## Fast Food Consumption Pattern and Risk of Development of Obesity among Young Individuals: A Population Based Study

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### Abstract

*Introduction:* Overweight and obesity have also been reported to be associated with a variety of lifestyle factors, among which eating pattern and eating behaviour have long been identified as a factor. Pattern of consumption of fast foods and their perception of this practice as a risk factor for obesity among university undergraduates have not been fully explored. Hence, this study was designed to assess fast food consumption pattern and the perception of it as a risk factor for obesity among undergraduates. *Materials and Methods:* This is a questionnaire-based study, which contained 48 questions relating to the socio-demographic characteristics; knowledge about fastfoods and pattern of its consumption and eating behavior, was used for the survey. A total of 250 subjects who gave a history of fast food consumption for a minimum period of one year belong to the age group of 18 to 30 years were recruited. *Results:* The association between fast food consumption and the development of obesity was negatively correlated in undergraduate university students. The snack after dinner was also found to be negatively correlated ( $p=0.028$ ) with the fast food consumption and the development of obesity. *Conclusion:* This study showed the level of awareness of fast food consumption among the undergraduates and its risk for developing obesity. Therefore, this study emphasizes the promotion of healthy dietary intake and food choices while highlighting the harmful effects of excessive consumption of fast foods.

**Keywords:** Fast Food Consumption; Obesity; University Undergraduates.

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### Introduction

Obesity is a major risk factor for chronic diseases, and it also plays a central role in both insulin resistance and metabolic syndrome, like hyperinsulinemia, hypertension, and type-II diabetes mellitus [1]. Overweight and obesity have also been reported to be associated with a variety of lifestyle factors [2,3], among which eating pattern and eating behaviour have long been identified as a factor.

Several studies have reported an association between eating speed and overweight [4], and eating until full, which refers to consuming a large quantity

of food in one meal [5], has been reported to be associated with overweight. Maruyama et al. reported that both eating quickly and eating until full are associated with overweight among adults, and the combination of the two may have a substantial effect on overweight [5].

Eating pattern includes increased consumption of energy dense, nutrient poor foods that are high in fat, sugar and salt. Adding on to it is the reduced physical activity of children and adolescents [6]. Often overall nutrient intake adequacy improves with an increasing variety of foods, but the movement towards more fats, salt, sugars and refined foods quickly moves beyond the optimal state to one in which diets contribute to rapidly escalating rates of obesity and chronic diseases [7]. Studies have shown that rural dwellers diets are low in fat and sugar but high in carbohydrates and fibre [8], while their urban counterparts show high fat and low fibre and carbohydrate intake [9] which is typical of a western diet. Epidemiological data from developing and developed countries concluded that with the westernization of diet, many chronic diseases would emerge first as obesity [8], followed by diabetes and cardiovascular changes.

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The increase in these diseases has been associated with increased urbanization and lifestyle changes [9]. The dietary changes from traditional high fibre diets towards foreign fast food diets have contributed to the increase in the incidence of diet related non-communicable diseases. The concept of fast food eating has expanded into food sales in schools and colleges. For many students the day is not complete without observing the "daily ritual" of visiting a fastfood joint and most of the fast food restaurants have began to open centres within and very close to schools and especially university campuses [10].

Consumption of fast foods has gradually become a common lifestyle especially in urban areas and among young people in spite of the associated adverse health consequences. University undergraduates pattern of consumption of fast foods and their perception of this practice as a risk factor for obesity have not been fully explored. Hence, this study was designed to assess fast food consumption pattern and the perception of it as a risk factor for obesity among undergraduates.

## Materials and Methods

This cross sectional descriptive study conducted in 250 subjects who gave a history of fast food consumption for a minimum period of one year were included in the study. Subjects belonged to the student community of medical, dental and paramedical courses of Nitte (Deemed to be) University. This is

a questionnaire-based study, which contained 48 questions relating to the socio-demographic characteristics; knowledge about fast foods and pattern of its consumption and eating behavior, was used for the survey. The age group of the subjects was 18 to 30 years.

### Statistical Analysis

The data were presented as counts and percentages if categorical or as means and standard deviations if continuous. Chi square test and Fischer's exact test was used to find the association between fast food consumption and the awareness of disease that will affect from consumption of fast food. A 'p' value of less than 0.05 was considered the level of significance.

## Results

Our results provide some of the first evidence to show the relationship between eating behaviour, fast food consumption pattern and development of obesity among young undergraduate medical students. The Table 1 explains the demographic characteristics of the participants. The age of the participants of the present study ranged between 18-30 years (94% is below 20 years). Majority were males (55.6%). The birth weight of majority of the participants was between 2500g to 3500g. The parents of most of the participants (44.7%) were professionals without having obesity in any of the parents (Table 1).

**Table 1:** Demographic characteristics of the participants

| Variables                 | Frequency | Percentage |
|---------------------------|-----------|------------|
| <b>Age (years)</b>        |           |            |
| <20                       | 142       | 94         |
| 20-25                     | 7         | 4.6        |
| 26-30                     | 2         | 1.3        |
| <b>Gender</b>             |           |            |
| Male                      | 84        | 55.6       |
| Female                    | 66        | 44.4       |
| <b>Birthweight (g)</b>    |           |            |
| <2500                     | 18        | 11.9       |
| 2500-2999                 | 50        | 33.1       |
| 3000-3499                 | 44        | 29.1       |
| 3500-3999                 | 20        | 13.2       |
| 4000+                     | 12        | 7.9        |
| <b>Parents Occupation</b> |           |            |
| Self Employed             | 39        | 25.8       |
| Employed                  | 40        | 26.5       |
| Professional              | 67        | 44.4       |
| Retired                   | 2         | 1.3        |
| Clergy                    | 1         | 0.7        |
| No Response               | 1         | 0.7        |
| <b>Parents Obesity</b>    |           |            |
| None                      | 106       | 70.2       |
| Father Only               | 19        | 12.6       |
| Mother Only               | 19        | 12.6       |
| Father and Mother         | 7         | 4.6        |

1. Association between fast food consumption and the awareness of disease that will affect from consumption of fast food.

Chi square test and Fischer’s exact test was used to find the association between fast food consumption and the awareness of disease that will affect from consumption of fast food. It showed that, the fast food consumption between 2PM and 6 PM and between 6PM and 10 PM was significantly high (p=0.031

respectively) though the pupil is aware of disease caused due to fast food consumption (Table 2). In the same way, the reasons for eating at fast food was significantly correlated (p=0.023) with the awareness of disease caused due to fast food consumption. The reasons may be advertisement or enjoyment or the taste or the lack of cooking skill, the limited time, the cost/ price, the variety of menu or eating with friend/ family (Table 2).

**Table 2:** Association between fast food consumption and the awareness of disease that will affect from consumption of fast food

|   |                        | Never | Certainly | Absolutely | Test statistic               | P value       |
|---|------------------------|-------|-----------|------------|------------------------------|---------------|
| Skipping breakfast                              | yes                    | 4     | 77        | 40         | 4.196 (chi square)           | 0.112         |
|   | no                     | 3     | 14        | 13         |                              |               |
| Snack after dinner                              | Seldom/none            | 3     | 72        | 46         | 4.699(Fischer’s exact test)  | 0.69          |
|   | Always/often           | 3     | 19        | 7          |                              |               |
| Eating speed                                    | fast                   | 1     | 22        | 12         | 4.171(Fischer’s exact test)  | 0.353         |
|   | medium                 | 3     | 58        | 33         |                              |               |
|   | slow                   | 3     | 11        | 8          |                              |               |
| Eating until full                               | yes                    | 4     | 46        | 27         | 0.178(Fischer’s exact test)  | 1.000         |
|   | no                     | 3     | 45        | 26         |                              |               |
| Number of times in a week you consume fast-food | 0 times                | 1     | 11        | 4          | 7.125(Fischer’s exact test)  | 0.246         |
|   | 1-2 times              | 3     | 59        | 35         |                              |               |
|   | 3-4 times              | 2     | 18        | 8          |                              |               |
|   | 5 times or more        | 1     | 3         | 6          |                              |               |
| When do u typically eat at fast-food            | breakfast              | 0     | 1         | 2          | 6.466(Fischer’s exact test)  | 0.353         |
|   | Lunch                  | 2     | 13        | 6          |                              |               |
|   | dinner                 | 1     | 47        | 27         |                              |               |
|   | snack                  | 4     | 30        | 18         |                              |               |
| What time of day do you eat fast food           | Before 11AM            | 2     | 1         | 2          | 18.117(Fischer’s exact test) | <b>0.031*</b> |
|   | Between 11AM and 2 PM  | 1     | 6         | 2          |                              |               |
|   | Between 2PM and 6 PM   | 1     | 35        | 17         |                              |               |
|   | Between 6PM and 10 PM  | 4     | 48        | 30         |                              |               |
|   | After 10 PM            | 1     | 1         | 2          |                              |               |
| Reasons for eating at fast food                 | Advertisement          | 2     | 3         | 1          | 20.810(Fischer’s exact test) | <b>0.023*</b> |
|   | Enjoy the taste        | 2     | 60        | 40         |                              |               |
|   | Lack of cooking skill  | 2     | 5         | 1          |                              |               |
|   | Limited time           | 1     | 5         | 3          |                              |               |
|   | Cost/price             | 0     | 1         | 1          |                              |               |
|   | Variety of menu        | 0     | 2         | 3          |                              |               |
|   | Eat with friend/family | 0     | 15        | 4          |                              |               |
| Taking fast food depends on emotional factors   | Strongly agree         | 2     | 17        | 11         | 4.030(Fischer’s exact test)  | 0.674         |
|   | agree                  | 3     | 34        | 15         |                              |               |
|   | neutral                | 2     | 29        | 15         |                              |               |
|   | disagree               | 0     | 11        | 11         |                              |               |

2. Association between fast food consumption and the development of obesity.

Chi square test and Fischer’s exact test was used to find the association between fast food consumption and the development of obesity. It showed that, the snack after dinner was found to be negatively correlated (p=0.028) with the fast food consumption and the development of obesity (Table 3).

Skipping breakfast, snack after dinner, eating speed, number of times in a week he/she consume fast-food, time of the day he/she eat fast-food, reasons for eating at fast-food, taking fast-food depends on

emotional factors etc. did not show any correlation with the awareness of disease caused due to fast food consumption and the development of obesity. The preference of fast food to home meal and the probable causes for the fast food consumption was analysed and shown in the Table 4. This showed that the branding of the fast food, prices of the fast food, taste of the fast food is the main reason for preferring the fast food over homemade food.

The type of fast food consumption by the participants was described in the (Table 5). This showed that majority consume burgers than biriyani

**Table 3:** Association between fast food consumption and the development of obesity

|  |                          | Yes | No | Test statistic              | P value |
|--|--------------------------|-----|----|-----------------------------|---------|
| Skipping breakfast                               | Yes                      | 113 | 5  | 0.313(Chi square test)      | 0.433   |
|  | no                       | 28  | 2  |                             |         |
| Snack after dinner                               | Seldom/none              | 115 | 3  | 6.497(Chi square test)      | 0.028*  |
|  | Always/often             | 25  | 4  |                             |         |
| Eating speed                                     | fast                     | 34  | 1  | 1.531(Fischer's exact test) | 0.531   |
|  | Medium                   | 88  | 4  |                             |         |
|  | slow                     | 19  | 2  |                             |         |
| Eating until full                                | yes                      | 74  | 2  | 0.25(Fischer's exact test)  | 0.266   |
|  | no                       | 67  | 5  |                             |         |
| No. of times in a week u consume fastfood        | 0 times                  | 16  | 0  | 5.259(Fischer's exact test) | 0.108   |
|  | 1-2 times                | 92  | 3  |                             |         |
|  | 3-4 times                | 23  | 4  |                             |         |
|  | 5 times or more          | 10  | 0  |                             |         |
| When do u typically eat at fast food restaurants | breakfast                | 2   | 1  | 6.250(Fischer's exact test) | 0.078   |
|  | lunch                    | 18  | 2  |                             |         |
|  | dinner                   | 71  | 2  |                             |         |
|  | snack                    | 50  | 2  |                             |         |
| What time of the day u eat fastfood              | Before 11AM              | 3   | 1  | 7.394(Fischer's exact test) | 0.242   |
|  | Btwn 11AM and 2PM        | 8   | 0  |                             |         |
|  | Btwn 2PM and 6PM         | 48  | 4  |                             |         |
|  | Btwn 6PM and 10PM        | 78  | 2  |                             |         |
|  | After 10PM               | 2   | 0  |                             |         |
| Reasons for eating at fastfood                   | Advertisement            | 6   | 0  | 7.189(Fischer's exact test) | 0.250   |
|  | Enjoy the taste          | 96  | 4  |                             |         |
|  | Lack of cooking skill    | 7   | 1  |                             |         |
|  | Limited time             | 8   | 1  |                             |         |
|  | Cost/price               | 2   | 0  |                             |         |
|  | Variety of menu          | 4   | 1  |                             |         |
|  | Eat with friend / family | 18  | 0  |                             |         |
| Taking fastfood depends on emotional factors     | Strongly agree           | 29  | 1  | 1.710(Fischer's exact test) | 0.669   |
|  | agree                    | 47  | 4  |                             |         |
|  | neutral                  | 42  | 2  |                             |         |
|  | disagree                 | 22  | 0  |                             |         |

**Table 4:** Details of the causes for fast food consumption

|  | Frequency | Percentage |
|--|-----------|------------|
| <b>Preference of fast food to home meal</b>                  |           |            |
| Yes  | 65        | 43.0       |
| No   | 86        | 57.0       |
| <b>Reasons for preference of fast food to home meal</b>      |           |            |
| Readily available without stress                             | 40        | 26.5       |
| More delicious and nutritious                                | 41        | 27.2       |
| Weight control   | 8         | 5.3        |
| No response  | 59        | 39.1       |
| <b>Does branding affect the chosen fast food</b>             |           |            |
| Strongly Agree   | 36        | 23.8       |
| Agree  | 68        | 45.0       |
| Neutral  | 46        | 30.5       |
| Disagree   | 1         | 0.7        |
| Strongly Disagree  |           |            |
| <b>Fast food prices are influencing the chosen fast food</b> |           |            |
| Strongly Agree   | 20        | 13.2       |
| Agree  | 63        | 41.7       |
| Neutral  | 56        | 37.1       |
| Disagree   | 9         | 6.0        |
| Strongly Disagree  | 2         | 1.3        |
| <b>Reasons for choosing to eat at fast food</b>              |           |            |
| Advertisement  | 6         | 4          |
| Enjoy the taste  | 102       | 67.5       |
| Lack of cooking skill  | 8         | 5.3        |
| Limited time   | 9         | 6          |
| Cost/Price   | 2         | 1.3        |

|                         |    |      |
|-------------------------|----|------|
| Cost/Price              | 2  | 1.3  |
| Variety of menu         | 5  | 3.3  |
| Eat with friend/ family | 19 | 12.6 |
| Ice cream               | 1  | 0.7  |
| KFC                     | 1  | 0.7  |
| McDonalds               | 6  | 4.0  |

**Table 5:** Analysis of the type of food consumption by the participants

|   | Frequency | Percentage |
|---|-----------|------------|
| <b>What do you usually eat at fast food restaurant</b>        |           |            |
| Burger  | 45        | 29.8       |
| Fries   | 17        | 11.3       |
| Pizza   | 27        | 17.9       |
| Fried Chicken   | 24        | 15.9       |
| Sandwich  | 16        | 10.6       |
| Icecream  | 18        | 11.9       |
| Others  | 3         | 2.0        |
| Chiken Biryani  | 1         | 0.7        |
| <b>What beverage do you usually order with fast food meal</b> |           |            |
| No Drink  | 11        | 7.3        |
| Mineral Water   | 21        | 13.9       |
| Carbonated Drink  | 43        | 28.5       |
| Carbonated Diet Soda  | 8         | 5.3        |
| Fruity Juice  | 33        | 21.9       |
| Milk And Shake  | 28        | 18.5       |
| Lemonade  | 4         | 2.6        |
| Tea/Coffee  | 2         | 1.3        |
| Others  | 1         | 0.7        |

**Table 6:** Details of the time of fast food consumption by the participants

|  | Frequency | Percentage |
|--|-----------|------------|
| <b>Number of times a week you can consume fast food</b>  |           |            |
| 0 times  | 16        | 10.6       |
| 1-2 times  | 97        | 64.2       |
| 3-4 times  | 28        | 18.5       |
| 5 times or more  | 10        | 6.6        |
| <b>What do you typically eat at fast food restaurant</b> |           |            |
| breakfast  | 3         | 2          |
| lunch  | 21        | 13.9       |
| dinner   | 75        | 49.7       |
| snack  | 52        | 34.4       |
| <b>What time of day do you eat fast food</b>             |           |            |
| Before 11am  | 4         | 2.6        |
| Before 11am and 2pm                                      | 8         | 5.3        |
| Between 2pm and 6pm                                      | 53        | 35.1       |
| Between 6pm and 10pm                                     | 82        | 54.3       |
| After 10pm   | 2         | 1.3        |

and others along with the carbonated drinks. The time of fast food consumption by the participants was detailed in the Table 6. This indicated that majority of the participants consume fast food 1-2 times in a week preferably dinner in the fast food restraint between 6PM to 10PM. The awareness of the consequences of fast food consumption on the development of various disorders was explained in the Table 7. It showed

that the 38.4% of the participants knows about the nutritional information and ingredient content in each of fast food, 40.4% of the participants knows about the high salt content, 41.7% about the cholesterol and sugar content, 78.1% knows about the development of heart diseases and 93.4% of the participants had the knowledge of development of obesity on consumption of fast food.

**Table 7:** Awareness of the consequences of fast food consumption

|  | Frequency | Percentage |
|--|-----------|------------|
| <b>Awareness about nutritional information and ingredient content in each of fast food</b> |           |            |
| Not at all   | 10        | 6.6        |
| Rarely   | 41        | 27.2       |
| Sometimes  | 58        | 38.4       |
| Most of the time   | 32        | 21.2       |
| Always   | 10        | 6.6        |
| <b>Respondents knowledge of the contents of fast food consumed</b>                         |           |            |
| High salt content  | 61        | 40.4       |
| High sugar content   | 14        | 9.3        |
| Saturated fats   | 21        | 13.9       |
| High cholesterol   | 43        | 28.5       |
| Additives  | 5         | 3.3        |
| Low fiber content  | 6         | 4.0        |
| <b>Are you aware of disease that will affect from consumption of fast food</b>             |           |            |
| Never  | 7         | 4.6        |
| Certainly  | 91        | 60.3       |
| Absolutely   | 53        | 35.1       |
| <b>Respondents perception of how fast foods can lead to non-communicable diseases</b>      |           |            |
| Fast food contain cholesterol, sugar, salts, fats  | 63        | 41.7       |
| Fastfoods are not cooked under healthy condition   | 34        | 22.5       |
| Excessive consumption of fast food   | 24        | 15.9       |
| Intake of chemicals  | 25        | 16.6       |
| Increases the risk of developing NCDs  | 1         | 0.7        |
| Long preservation  | 2         | 1.3        |
| <b>Which of the following are effects of taking fast food frequently</b>                   |           |            |
| Heart Disease  | 118       | 78.1       |
| Dyslipidemia   | 4         | 2.6        |
| Pcod   | 4         | 2.6        |
| Sleep Apnea  | 11        | 7.3        |
| Arthritis  | 4         | 2.6        |
| Liver Damage   | 6         | 4          |
| Stroke   | 1         | 0.7        |
| <b>Do you know taking fast food frequently can cause obesity</b>                           |           |            |
| Yes  | 141       | 93.4       |
| No   | 7         | 4.6        |

## Discussion

The current cross sectional survey attempted to investigate the relationship between eating behaviour, fast food consumption pattern and development of obesity among young individuals.

Findings of the study showed that, fast food consumption between 2PM and 6 PM and between 6PM and 10 PM was significantly high and the participants were aware of disease caused due to fast food consumption. In the same way, the reasons for eating at fast food was significantly correlated ( $p=0.023$ ) with the awareness of disease caused due to fast food consumption. It was also showed that, the reasons such as advertisement or enjoyment or

the taste or the lack of cooking skill, the limited time, the cost/price, the variety of menu or eating with friend/family were the significant factors for the consumption of fast food. In the past few decades, fast food (food prepared in a restaurant with limited service staff and from which the majority of meals are consumed off premises) has been implicated as one of the contributors to increased population rates of obesity [11-14]. The growth of the fast-food industry has led to an increased consumption of food prepared away from home that is high in total and saturated fat, as well as sodium, but low in dietary fibre, calcium, and iron [15].

In recent years, there has been a marked increase in the rates of obesity in countries such as India that has been attributed to unhealthy lifestyle practices

associated with the introduction of Western-style fast foods that are higher in fat and refined carbohydrates [16,17].

In a study on National Prevalence of Obesity: Changing patterns of diet, physical activity and obesity among urban, rural and slum populations in north India by Yadav and Krishnan, reported that the prevalence of central obesity in North India increased with the level of urbanization in both men and women by 8.7% and 34.5%, respectively [18]. Result of our study is not in accordance with the reports of above stated study. This indicates the development of obesity is not directly linked to fast food consumption. The genetics of parents play a major role because; both the parents of majority of the participants were not obese. This is in accordance with a population-based study from 4 distinct regions in Europe conducted by Ulf Ekelund et.al. On the association between obesity, physical activity and indicators of body fatness in 9 to 10 year old European children reported that the rising prevalence of obesity in children may be due to a reduction in physical activity [19]. Our results are in line with the he Chandigarh Healthy Heart Action Project (CHHAP), which reported that more people aged 15-24 years old living in an urban area (72%) preferred Western-style fast food [20].

## Conclusion

This study showed the level of awareness of fast food consumption among the undergraduates and its risk for developing obesity. Therefore, this study emphasizes the promotion of healthy dietary intake and food choices while highlighting the harmful effects of excessive consumption of fast foods.

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