"NUTRITION TRANSITION AS AFFECTED BY MASS MEDIA: A STUDY ON YOUTH IN A METROPOLITAN CITY OF HARYANA"

BY

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[2010HS153M]

Thesis submitted to the Chaudhary Charan Singh Haryana Agricultural University in the partial fulfillment of the requirements for the degree of:

MASTER OF SCIENCE

IN

FOODS AND NUTRITION

DEPARTMENT OF FOODS & NUTRITION
I.C.OLLEGE OF HOME SCIENCE
CCS HARYANA AGRICULTURAL UNIVERSITY
HISAR - 125004 (HARYANA)

2013

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This is to certify that this thesis entitled **"Nutrition transition as affected by mass media: A study on youth of Haryana"** submitted for the degree of **Master of Science**, in the subject of **"Foods and Nutrition"** to the CCS Haryana Agricultural University, is a bonafide research work carried out by **Urvashi Mehlawat** under my supervision and that no part of this dissertation has been submitted for any other degree.

The assistance and help received during the course of investigation have been fully acknowledged.

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ACKNOWLEDGEMENT

In the ecstasy of delight, I pay my abysmal obeisance to the, all mighty, who enriched me each and every moment, whose bounteous love is essence for my life and whose mercy and blessings, this piece of work is a result.

Like a light house that signals the ship to the shore, is my guide, a good ray of hope, she led to better knowledge and understanding all through my search for wisdom. My deep sense of gratitude and obligation to my venerable major advisor Dr. (Mrs.) Neelam Khetarpaul, Professor, Foods and Nutrition, for her sustaining guidance, constant encouragement, sublime suggestions, intellectual stimulations, luminous guidance, motherly support, affectionate behavior and pain taking efforts to help me during entire period of my research work and preparation of the manuscript.

To tiny is the gratitude and too great is the gift of knowledge and constant encouragement bestowed on me by my co-advisor Dr. (Mrs.) Sudesh Jood, Associate Professor, Department of Foods and Nutrition.

I find Laurence of words to express my due regards and gratitude to members of my advisory committee for their consistent help, valuable suggestions and necessary prerequisites needed for the present study. Earnest thanks are due to Dr, (Mrs.) Nita Khanna, Professor, Lala Lajpat Rai University of Vety. & Animal Sciences, Dr. Shashi Madan, Professor (Biochemistry), Department of Plant Breeding, Dr. Veena Manocha, Professor & Joint Director (HRM), Department of Math and Statistics and other faculty members for their commendable suggestions, ever willing help and advice throughout the study.

My special thanks and sincere gratitude is also extended to Dr.Varsha Rani, Assistant Professor, Department of Foods and Nutrition for her constructive criticism, competent advice, needful help and affection.

Words at my command fail at this juncture in form and in spirit to express my heartfelt reverence, unbound gratitude indebtness and utmost affection towards my beloved mother Smt. Rakesh Kumari and father Shri Ramesh Kumar Mehlawat. Perhaps words in any dictionary can express the thankfulness a child feels towards his/her parents. It is their rearing, blessings and prayers that enabled me to climb various staircases of life and conduct and compile this work.

With unbound affection I spread special fragrance of thanks to my adorable brother Kunal for his care and boundless affection.

Friendship needs no studied phrases, polished face or winking wiles. They are my friends Anuradha Srivastava, Mansi Gupta, Neha Rana di, Promila Dahiya di, Vandana Sati, Princy Katyal, Divya Sethi, Savita Rathee, Babita Rathee, Himpriya Goswami, Sushma Kantiwal, Bharti Swami, Seema, Kavita , Rahul Hoare and Chirag Ranjan Nath who at times criticized, scolded and encouraged me to keep my determinacy to reach at proper decision.

Last but not least I also wish to endorse my sincere thanks to all those who directly or indirectly helped me during my thesis work.

Place: Hisar
Date: December, 2012 **(URVASHI MEHLAWAT)**

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CHAPTER-I

INTRODUCTION

The ónutrition transitionô a term used to describe shifts in diet, physical activity, health and nutrition can be traced to higher incomes, the influence of mass media and food marketing, and a range of changes in the nature of work and leisure (Popkin, 2000). It is an increased consumption of unhealthy foods compounded with increased prevalence of overweight in middle-to-low-income countries. It occurs in conjunction to the Epidemiological Transition and has serious implications in terms of public health outcomes, risk factors, economic growth and international nutrition policy.

Globalization processes are perceived to play a role in nutrition: the growth of transnational food companies (TFCs); the development of transnational supermarkets; liberalization of foreign direct investment; global food advertising and promotion; the liberalization of international food trade; liberalization and commercialization of domestic agricultural markets; technological developments; and cultural influences. These globalization processes are driving changes in the food supply and the availability of financial resources, thus affecting both the nutrition transition and under-nutrition. TFCs have altered the food supply by increasing the availability of processed and fast foods, making them more accessible through large transnational supermarkets, and making them more desirable through the use of advertising and promotion. Supermarkets are playing two roles in the nutrition transition: shifting demand for home-produced foods or foods purchased in open markets to increased dependence on store-bought foods supplied by TFCs; and expanding available choices of packaged and processed foods. Expenditure on food advertising is high and increasing in developing countries; a significant proportion of this advertising is for energy-dense processed foods targeted at children and youth. The objective of this advertising is to encourage greater consumption of processed foods (WHO, 2007).

Various other factors that further alleviate the problem are (a) the worldwide shifts in trade of technology innovations that affect energy expenditures during leisure, transportation, and work; (b) globalization of modern food processing, marketing and distribution technique (most frequently linked with westernization of the worldôs diet); (c) vast expansion of the global mass media; and (d) other changes that constitute the rubric of impacts resulting from an increased opening of our world economy.

Nutrition transition is malnutrition ensuing not merely from a need for food, but the need for high-quality nourishment. Foods rich in vitamins, minerals, and micronutrients such as fruits, vegetables, and whole grains have been substituted by foods heavy in added sugar, saturated fat, and sodium. This trend, which began in developed, industrialized countries, has spread to developing countries like India. These developing countries still

stressed and struggling with hunger are now dealing with health problems associated with obesity. Malnutrition once identified by emaciated bodies, is now also associated with obesity.

Over the past 15 years, there has been increasing evidence that the structure of dietary intakes and the prevalence of obesity around the developing world have been changing at an increasingly rapid pace (Popkin *et al*., 2004). In India also, like most developing nations, obesity has emerged as more serious health threat than hunger. This transition in nutrition has occurred in less than a generation. These shifts are the continuation of a large scale changes that have occurred repeatedly over time, earlier limited to higher income group urban population, but increasingly trends are now affecting all sections of society.

On the energy-intake side, diet and eating behaviours are influenced by a complex set of interactions, ranging from individual choice to broader social, cultural, economic, and environmental determinants. Numerous studies have focused on social and economic determinants of healthy eating in the general population including children and adolescents which had shown a direct relationship between food consumption patterns and income, food pricing, education, employment, product marketing, mass media and other determinants. Food prices are the most important consideration in food choice. Price determinants often lead to the selection of ñcheaperò but biologically less valuable and spoiled foodstuffs in cases of restricted income. Part of the health consequences of these changes is clear now -the number of diseases caused by infected food is increasing (Zaborskis *et al*., 2012).

Modern society seems to be converging on a diet high in saturated fats, sugar and refined foods but low in fiber often termed as ôWESTERN DIETô-and on lifestyle characterized by lower levels of activity, thus increasing many health problems. Present day generation especially children and adolescents guzzle soft drinks in place of water, watch television, ride mopeds instead of walking and buy their food from supermarket; while adopting more sedentary lifestyles. Traditional meals have given way to crunchy fatty foods. Fast food chains such as McDonaldôs, Pizza Hut, KFC and Coffee houses have become the favourite hot spots of the present generation. This change in lifestyle and dietary habits is leading to the global paradox of obesity and malnutrition.

At the same time, media is playing a havoc with youthôs health. On one hand, youth is exposed to high sugar, high fat, high sodium and low fibre junk foods and on the other hand, youth is also exposed to glamour world of fashion, where everyone wants to be ultra thin. Worshipping of role models in different walks of life such as fashion, film industry and sports has resulted in a present day generation, which is mix of either overweight or undernourished ultra slims with a low ratio of youth that can be termed as ôNutritionally Healthyô. Besides it, the food industry is also one of the major players in the field of advertising, with food advertising on television dominated by breakfast cereals,

confectionary, savoury snacks, soft drinks and fast food restaurants; advertising for staples and fresh foods, by contrast is in decline. All this is influencing a lot on the nutritional and health status of our children whose food habits and eating patterns are being greatly influenced by the mass media.

Business is interested in children and adolescents because of their buying power and because of their influence on the shopping habits of their parents. As they are easier to influence, they are especially targeted by the advertising business. The marketing industry is facing increased pressure over claimed links between exposure to food advertising and a range of social problems, especially growing obesity levels. Fast food chains spend more than 3 billion dollars a year on advertising, much of it aimed at children. Restaurants offer incentives such as playgrounds, contests, clubs, games, and free toys and other merchandise related to movies, TV shows and even sports leagues. It's no wonder why children are continuously begging their parents to take them to McDonald's or Burger King; and these businesses are constantly reaping the benefits of this child manipulation. In 2006 forty four of the largest U.S food industries spent about 2 billion dollars on advertising, which mainly consisted of unhealthy, sugary and fatty foods. Such massive advertising has a detrimental effect on children and it heavily influences their diets. Extensive research proves that most of the food consumed between ages of 2-18 is low in nutrients.

The detrimental influence of television media on food choices and eating habits of youth is a serious issue and growing concern for public health officials, registered dietitians, and families interested in living their day to day lives in a healthy manner. Currently, the second leading cause of actual death according to the Center for Disease Control and Prevention is poor diet and physical inactivity (Schneider, 2006). Trends that lead to poor diet and physical inactivity, eventually obesity in adults and children alike, stem from habits that form early on in childhood. This creates an endless cycle that perpetuates from generation to generation and needs to be checked well in time. Therefore, there is a need to study the impact of mass media on nutrition transition taking place in India also over the last few years especially among children and youth. Keeping it in mind the present study has been planned with following objectives:

1. To study the impact of socioeconomic status and mass media exposure on eating habits, eating disorders, dietary patterns and dietary diversity scores of college going youth (18-21Y).
2. To assess nutritional status of college going youth (18-21Y).

CHAPTER-II

REVIEW OF LITERATURE

A systematic and thorough review of literature of previous research studies related to the problem under study provides helpful suggestions for significant investigation. Information related to the present study was collected from journals, books, research articles and scholarly publications on the internet.

This chapter includes a review of the researches conducted on the area both in India and abroad. Each of these studies has influenced the shaping of this research. The review has been organized in the following sections:

2.1 Socio-economic profile of youth

2.2 Assessment of food and nutrient intake of youth

2.3 Assessment of nutritional status of college going students

2.4 Mass-media interaction and effect on

2.5 Eating behaviour and disorders

2.6 Influence of nutrition transition

2.1 Socio-economic profile of youth

Sherwood *et al.* (2009) studied a socio-economically (SES) and ethnically diverse sample of 2, 516 adolescents from 1999 through 2004 and reported that girls and boys in the low SES category were more likely to be overweight than were those in the high SES category. Boys in high SES category showed a significant decrease in overweight prevalence between 1999 and 2004 whereas boys in the low and middle SES categories showed no significant change. Girls in the low SES category showed a significant 5-year increase in overweight prevalence compared with a stable prevalence of overweight among girls in the middle and high SES categories.

Tharkar and Vishwanathan (2009) studied the prevalence and risk factors of overweight and obesity among 1193 school children (8-15 y) from 3 schools (2 private and 1 corporation schools) which were selected by stratified cluster-sampling technique. They reported that overall prevalence of overweight was 12.1 per cent among the children and 15.5 per cent among the adolescents. Both overweight (22%) and obesity (13.7%) were the highest among girls from affluent families. The mean anthropometric measurements indicating prevalence of overweight and obesity were higher among the urban affluent children. Factors associated with overweight were upper socioeconomic status and greater than 2h television watching. The children had grossly inadequate knowledge about healthy lifestyle habits.

Hejazi and Mazloom (2009) determined the difference in the number of meals consumed away from home (restaurant or fast food) between low socio-economic status and (SES) and high SES adolescents. Eighty four adolescents (51 boys and 33 grls) were selected

who completed demographic questionnaire and three 24-hr recalls. It was observed that there was no significant difference in the number of meals consumed away from home in low SES adolescents as compared to high SES. However, those who consumed meals away from home reported a higher percentage of calories from fat and more servings of fried vegetables compared to those who consumed no meals away from home.

Goyal *et al.* (2010) conducted a study on 5664 school children of (12-18 y) belonging to different SES. The researchers observed that prevalence of overweight was14.3 per cent among boys and 9.2 per cent among girls where as the prevalence of obesity was 2.9 per cent in boys and 1.5 per cent in girls. The prevalence of overweight among children was higher in middle SES as compared to high SES group in both boys and girls whereas the prevalence of obesity was higher in high SES group than those belonging to middle SES group. The prevalence of obesity as well as overweight in low SES group was the lowest as compared to other groups. Eating habits viz., consuming junk foods, chocolate, eating outside at weekend and physical activity like exercise, sports, sleeping habit in afternoon etc. had remarkable effect on prevalence on overweight and obesity among middle to high SES group. Family history of diabetes and obesity were also found to be positively associated.

2.2 Assessment of food and nutrient intake of youth

Nutrients are consumed through the food that we eat, and through metabolic processes in the digestive system, these nutrients are absorbed at a cellular level in the body. Optimum nutrition contributes to health, wellbeing, normal development, and high quality of life (Gibney *et al*., 2009).

A large-scale study of 16,262 U.S. youth (with a mean age of 16 years) identified that only 22 per cent of young women and 29 per cent of young men consumed the recommended daily fruit and vegetable serving (Pesa and Turner 2001).

In a study conducted on Australian men it was found that men consumed less fruits and vegetables than women and compared to other groups, men aged 18-44 years also at a smaller variety of vegetables (Centre for Public Health, 2003). Men consume less high fibre foods, less low fat foods and more soft-drinks than women (Wardle *et al.*, 2004).

Dumbrell and Mathai (2008) identified in a sample of men aged 18 - 40 years that fruits and vegetables ranked lowly in Australian menôs culture ï this was particularly noticeable in younger men aged 18 ï 25 years where they were unconcerned about the health risks of diets low in fruit and vegetables.

OôSullivan *et al.* (2008) identified that a high-quality breakfast, consisting of 3 or more food groups, was associated with better mental health scores in adolescence. They reported that milk, fortified breakfast cereals and bread are good sources of nutrients (including carbohydrates, calcium, B vitamins, iron and folate) that positively affect brain function in adolescents.

Adolescents drank more full-calorie soda per day than milk. Males aged 12ï 19 years drank an average of 22 ounces of full-calorie soda per day, more than twice their intake of fluid milk (10 ounces), and females drank an average of 14 ounces of full-calorie soda and only 6 ounces of fluid milk (Forshee *et al*., 2002). According to Reedy and Krebs-Smith (2010), empty calories from added sugars and solid fats contributed to 40 per cent of daily calories for children and adolescents aged 2ï 18 years, affecting the overall quality of their diets. Approximately half of these empty calories came from six sources: soda, fruit drinks, dairy desserts, grain desserts, pizza, and whole milk.

Lytle *et al.* (2002) conducted a large-scale longitudinal study of youth between the ages of 8 and 14, and found that their diets became less nutrient-dense over time. In particular, this study found that during adolescence young peopleôs diets showed an increase in fat, saturated fat and sodium, and a decrease in vitamins, minerals and fibre ï these nutrients are all those implicated in chronic disease. They argued that the transition to adolescence, where young people experience an increased need for autonomy and a desire to express themselves, influences young peopleôs food choices. Furthermore, youth experience peer pressure which significantly influences their food choices. In comparison to younger children, teens might also be exposed to more unhealthy food choices in their environment.

A study was conducted by Turin *et al.* (2007) on 396 school going children who were residents of slums in different parts of Dhaka Metropolitan city. The age of the children were categorized into three age groups; Mean age for the children of age group-1 was 6.51 (±1.01) years, for the age group-2 was 9.24 (±1.09) years and for the age group-3 was 12.5 (±0.91) years. In 77.8 per cent of the cases, the child got three meals per day but inadequate in amount. In most of the cases the common foods were rice, lentil, potato and green leafy vegetables. The food frequencies reported by the children were; eggs: 1.4 times per week, milk: 1.2 times per week, meat: 0.4 times per week, fish: 2.8 times per week and fruits 2.9 times per week. Those children from families with lower incomes and less educated parents had a dietary pattern which tended to be poor regarding egg, milk, meat and fruit. It was concluded that the diets of these urban slum school children were inadequate for macronutrients and micronutrients, which is a danger for significant nutritional and health implications.

A study conducted with Irish adolescents indicated that parents are the biggest influencers in their childrenôs diets. In particular the frequency of shared dinners had a positive effect on adolescentsô food knowledge. Other factors influencing adolescentsô diets included their nutritional knowledge, friends (with whom high-fat fast foods were often consumed), government health campaigns and cooking programs on television. However, this study found that celebrity endorsements of food products had the least influence on adolescentsô diets (Walsh and Nelson 2010).

A study conducted by Akinyemi and Ibraheem (2009) on the assessment of nutritional status of 40 Queens College Students of Lagos State (10-19 years) revealed that the energy and nutrients intake of the students were generally low. Each age group was found deficient in energy, 40 per cent of age group 10-12 years, 15 per cent of age group 13-15 years was deficient in protein while a total of 15% was deficient in protein. Students in the lower classes suffered more nutritional deficiency. Vitamin C deficiency was found to be prevalent in the school, 80 per cent in age 11-12 years, 70 per cent in age 13-15 years 25 per cent in age 16-19 years and total of 63 per cent overall. About 15 per cent of the sample was CED (BMI <18.5), on the energy balance, 37.5 per cent were deficient. The findings were similar to those of other findings which established nutritional deficiencies among rural and urban Nigerian children and adolescents (Ijarotimi, 2004; Okwu *et al.* 2007).

A study was conducted to investigate changes in eating habits among Lithuanian school-aged children from 2002 to 2010, and to explore the association of these changes with the respondentsô reported socio-economic status (SES). Lithuanian data from the cross-national Health Behaviour in School-aged Children (HBSC) study collected in 2002, 2006 and 2010 was used. Analyses were conducted on comparable questionnaire-based data from children aged 11, 13 and 15 (total n = 17,189) from a random sample of schools. It was found that in Lithuania, school-aged children had low intakes of fruits and vegetables. Only 21.1 per cent of boys and 27.1 per cent of girls reported daily fruit consumption. Similarly, 24.9 per cent of boys and 29.6 per cent of girls disclosed vegetable intake at least once daily. Comparing 2010 to 2002, the proportion of girls who consumed fruits daily increased from 24.2 per cent to 31.0 per cent ($p < 0.001$) but the proportion of boys who consumed vegetables daily decreased from 29.3 to 23.1 per cent ($p < 0.001$). In 2006, for both sexes, there were observed increases in regular (at least five days a week) intake of sweets and chocolates, biscuits and pastries, and soft drinks; however, in the next survey (2010) these figures decreased. In addition, between 2006 and 2010, a substantial decrease in regular consumption of chips and fast food was also detected. Fruit and vegetable consumption as well as intake of sweets and chocolates, biscuits and pastries and soft drinks increased with family social-economic status and family material wealth. Trends in consumption of fruits, and other foods, and their association with changing social variables were demonstrated using the ORs estimated by three logistic models, using 2002 as the reference point. Changes in social variables from 2002 to 2010 affected the likelihood of daily consumption of fruits among boys by 22.5 per cent (the corresponding OR decreased from 1.11 to 0.86) and among girls by 34.0 per cent (the corresponding OR decreased from 1.41 to 1.12) (Zaborskis *et al.* 2012).

Kaur *et al.* (2009) conducted a study on 120 students of Guru Nanak Public, Senior Secondary School, Dhahan Kaleran in 2007 and revealed that one third of subjects (62%)

consumed three meals per day, regarding consumption of *chapattis*/day, forty eight (40%) adolescents consumed 4-6 *chapattis*. Regarding oil consumed for cooking, fifty six (47%) consumed refined oil and fifty nine consumed unrefined ghee. Forty eight (40%) adolescents consumed biscuit in between the meals. Half of the subjects consumed snacks once in between the meals and also after lunch. Sixty seven (56%) adolescents consumed such snacks sometimes while watching Television and 42 per cent subjects consumed fruit juice.

Boom *et al.* (2006) conducted a study on if and how ready-to-eat cereals (RTEC) contribute to the quality of the diet of children, adolescents and young adults. A random sample of 3534 subjects aged 2 to 24 years in Spain was studied. Food and nutrient intakes were determined by a 24 hour recall. RTEC consumption was assessed by a quantitative food frequency questionnaire. Cereal consumption was classified into non-consumers and daily intakes between 1 and 20g, 21 and 40g, and more than 40g. After excluding the under reporters, the final sample consisted of 2852 individuals. It was reported that about half of the population (49.8%) ate RTEC. Macronutrient profile improved with increasing cereal consumption. Intakes of thiamine, riboflavin and vitamin B_6 increased significantly with increasing consumption of RTEC in all age-sex groups, whereas niacin and folate intake improved in almost all groups and calcium, iron and vitamin D in at least half of the groups. Except for magnesium, vitamin B_{12} and vitamin E in males, consumption of RTEC was significantly associated with increased coverage of the daily nutrient requirements for all micronutrients studied. Higher levels of RTEC consumption was associated with a greater consumption of dairy products, and related to better breakfast quality.

2.3 Assessment of nutritional status of college going students

Gallo and Schell (2007) reported that native American youth was at risk for overweight, and an increased prevalence of obesity. Skinfolds, circumferences, and body breadths to assess body size and shape were measured in Akwesasne Mohawk youth (n = 271) between the ages of 10.0 and 16.99 and it was found that Akwesasne youth had thicker skinfolds and larger circumferences than youth in the national surveys. Additionally, these cross-sectional data indicated that body fat was more centrally distributed in Akwesasne Mohawk boys and girls.

Kimani-murage *et al.* (2010) conducted a study involving 3511 children and adolescents 1-20 years, selected through stratified random sampling from a previously enumerated population living in Agincourt subdistrict, Mpumalanga Province, South Africa. Anthropometric measurements including height, weight and waist circumference were taken using standard procedures. It was found that about one in five children aged 1-4 years was stunted; one in three of those aged one year. Concurrently, the prevalence of combined overweight and obesity, almost non-existent in boys, was substantial among adolescent girls, increasing with age and reaching approximately 20-25 per cent in late adolescence. Central

obesity was prevalent among adolescent girls, increasing with sexual maturation and reaching a peak of 35 per cent indicating increased risk for metabolic disease.

Mulugeta *et al.* (2009) assessed the nutritional status of rural adolescent girls of Tigray, Nothern Ethiopia. Anthropometric and socio-demographic information from 211 adolescent girls representing 650 randomly selected households from thirteen communities was used in data analysis. Height-for-age and BMI-for-age were compared to the WHO growth reference (2007). It was concluded that none of the households reported access to adolescent micronutrient supplementation. The girls were shorter and thinner than the WHO reference population (2007). The cross-sectional prevalence of stunting and thinness were 26.5 per cent and 58.3 per cent, respectively. Lack of latrine facilities was significantly associated with stunting and thinness. Age was strong predictor of stunting and thinness.

Al-Rewashdeh and Al-Dmoor (2010) assessed the body measurements and dietary intake of 178 students (96 males and 82 females) aged 20.4 to 22.6 years at Faculty of Agriculture/Mu'tah University. The nutrition status of students was assessed by using anthropometry and dietary methods and compared with available references. Males and females had means of weight (kg): 59.6±2.1 and 55.8±2.4 and of height (m): 1.67±0.08 and 1.61±0.07, respectively. Males and females had circumferences (cm) of arm: 28.6±1.2 and 25.3±0.8; of waist (W): 86.1±2.6 and 72.8±3.1 and of hip (H): 85.8±1.2 and 90.4±2.8, respectively. Males had significantly lower triceps, total skin folds and percent of total body fat than the females. Arm muscle circumference, arm area and arm muscle area were higher, whereas arm fat area was lower in males than in females. Males consumed higher energy (2208±85 kcal day^{-1}) and protein (43.1±4.3 g day^{-1}) than females (2035±93 kcal day^{-1} and 39.2±3.5 g day^{-1}). The Relative Energy Contribution (REC) of carbohydrates, total fat, saturated fat and monounsaturated fat in diets of males and females was higher, whereas the REC of polyunsaturated fat and protein were lower than the recommended. Males and females received lower vitamins (except E), macro minerals (except sodium) and micro minerals (except iron in males) than the recommended.

Dambhare *et al.* (2010) conducted a study on 116 children in the age group of 10 to 19 years studying in high school of peri urban area of Wardha. Nutritional status of the adolescents was assessed through weight for age (wasting) and height for age (stunting) according to WHO criteria. Mean age of the adolescents was 13.16+ 1.99; 48.3 per cent of the adolescents were found to be normal and 51.7 per cent were underweight. Early adolescents were at the highest risk of underweight significantly more 73.3 per cent ($p < 0.05$) as compared to late adolescents 26.7 per cent. Overall, 34.5 per cent of the adolescents were stunted with boys suffering more 72.5 per cent as compared to girls 27.5per cent; 28.45 per cent of the school going adolescents had anaemia with girls suffering significantly more (38.89%) ($p < 0.05$) as compared to boys (23.75%); 35.34 per cent adolescents had dental

caries; 13.79 per cent adolescents were found to be suffering from refractive error; 7.76 per cent adolescents had worm infestation; 6.9 per cent adolescents had skin problems; 2.59 per cent adolescents had tonsillitis and 2.59 per cent had wax in the ear.

Prajapati *et al.* (2011) studied 401 students (10-19years) from 10 schools and colleges surveyed using pretested questionnaire about nutritional status and high risk behaviour. To analyze nutritional status, height, weight and BMI were taken and analyzed using WHO growth standards (2007); 47.4 per cent (95% CI= 30.7% - 64.6%) were stunted and 19.5 per cent (95%CI=12.6% - 28.7%) were overweight. Only boys (15.9%) had addiction and common was tobacco chewing (61.29%).

A study was conducted by Ejike *et al.* (2010) on 625 secondary school students aged 10-19 years in a low income semi-urban town in Nigeria. Anthropometric data was collected and their Body Mass Index (BMI) was measured. Their heights and weights were compared to those of a reference population. It was found that the girls matched the heights of half of the reference population at all ages, but the boys did not. Under-nutrition was found to affect 19.36 per cent of the population (with stunting accounting for 84.47% of this group), while 13.23 per cent of the population were overweight/obese. The prevalence of thinness and stunting were higher in boys than in girls. Boys were slightly more obese than the girls.

Al-Rethaiaa *et al.* (2010) examined 357 male students chosen randomly from College of Health Science at Rass, Qassim University, KSA and observed that 21.8 per cent of the students were overweight and 15.7 per cent were obese. They found that total body fat exceeded its normal limits in 55.2 per cent of the participants and VFL was high in 21.8 per cent of them. The most common eating habits encountered were eating with family, having two meals per day including breakfast, together with frequent snacks and fried food consumption. Vegetables and fruits, except dates, were not frequently consumed by most students.

Four hundred and ninety one females aged 18-20 years of Raja N. L. Khan Womenôs College, Midnapore, West Bengal were studied and one commonly used indicator i.e., body mass index (BMI; kg/m^2), was used to evaluate the nutritional status of the subjects. The mean BMI of the subjects was 20.05 kg/m^2. It was revealed that there was a significant increasing age trend in mean BMI. The overall age combined prevalence of Chronic Energy Deficiency was 28.3 per cent. Overall, only 4.5 per cent belonged to the overweight category. A significant age relationship existed in the prevalence of CED. According to the WHO classification of low BMI, it was clear that studied college girls of Midnapore, India were in serious situation for all ages and the youngest (18 years) among them were experiencing the most serious situation (32.7 %) with respect to their health and nutritional status. (Mandal *et al.,* 2011).

2.4 Mass-Media interaction and its influence on food and nutrient intake of youth

Henry (2004) reported that the amount of time children spend with different sources of media from: television, film, video games, and computer or online media is exceedingly taking up the greater part of their time. With the average five and a half hours children spend using media on a daily basis, the only thing they spend more time doing is sleeping. Also television media increases childrenôs exposure to advertisements that are purposely directed towards them as a young, impressionable audience. Children are exposed to about 40,000 advertisements annually.

Roberts *et al.* (2005) reported that the average young person (age 8 to 18) lived in a home with more than three televisions, three radios, two video game consoles and a computer. Among school-age youth (ages 8 to 18), 74 percent lived in a home where the computer had an internet connection, and 60 percent had access to an instant messaging program. More than two-thirds of school-age youth (ages 8 to 18) and one-third of young children (ages 6 months to 6 years) had a television in their bedroom. Many school-age youth also had their own radio (84 %), video game console (49 %), computer (35 %) and internet connection (20 %). It was also reported that between 1999 and 2004, the average length of time of using a computer for recreation more than doubled from 27 to 62 minutes daily; surfing the internet doubled from 7 to 14 minutes. School-age youth (8 to 18y) spent an average of three hours per day watching television, and more than half of television time was devoted to no other activities. The activity most often paired with watching television was eating; youth reported eating 14 percent of the time that they spent watching television.

Grossberg (2006) opined that from age two to twenty, only eighteen years, that adds up to over 29,900 hours spent with media and 1.8 times more than the 16,000 hours spent in school grades k-12, that equals out to approximately 20 hours per week (Francis and Birch, 2006). Three of every four adolescents aged 15 to 17 and 40 percent of youth ages 12 to 14 carried their own cell phone. High proportions of toddlers and preschoolers (75%), school-aged children (84 %) and adolescents (73 %) watched television every day (Perton, 2008).

An analysis by the Federal Trade Commission (FTC) indicated that the nationôs largest food and beverage companies spent $1.6 billion in 2006 to market their products to children and adolescents. These companies used a number of different techniques to market food and beverage products. Advertisers used multiple sponsored media channels (e.g., television, radio, magazines, signs/billboards and the Internet) to deliver their messages and raise public interest. The largest share of advertising budgetsô 46 percent of all youth-marketing expenditures in 2006 was dedicated to television because it had the potential to reach a broad audience (Federal Trade Commission, 2008).

Vereecken *et al.* (2005) studied 162 305 young people completing the 2001/02 Health Behaviour in School-Aged Children survey, a World Health Organization cross-national

study on health and health behaviours among 11, 13 and 15 years old school pupils. Large differences were found between countries in reported daily TV viewing time, from an average of 2.0 h in Switzerland to 3.7 h in Ukraine. The results indicated that those most likely to watch TV were boys, 13-year-olds and pupils of lower socioeconomic status. Those who watched more TV were more likely to consume sweets and soft drinks on a daily basis and less likely to consume fruit and vegetables daily, although the latter associations were not so apparent among Central and Eastern European countries.

Fleming-Morn and Thiagarajah (2005) opined that children exposed to excessive TV viewing, magazines, and movies were at the higher risk of obesity. When other variables were controlled, TV exposure independently increased the odds of becoming overweight by 50 per cent for both men and women. According to the American Obesity Association (2006), 65 per cent of adults and 30 per cent of children were overweight, and 30 per cent of adults and 15 per cent of children met the criteria for obesity. Rarely playing outdoors, children spent their days chatting online or watching TV while snacking on nutritionally empty foods. The average child spent 4 hours per day watching TV, and only 1 hour per day completing homework.

A study was carried out by Wiecha *et al.* (2006) to test increased television viewing was associated with increased total energy intake and with increased consumption of foods commonly advertised on television, and to test whether increased consumption of these foods mediates the relationship between television viewing and total energy intake. The sample included 548 students (mean age at baseline, 11.70 years; 48.4% female; and 63.5% white) from 5 Five public schools in 4 communities near Boston. Each hour increase in television viewing was associated with an additional 167 kcal/d and with increases in the consumption of foods commonly advertised on television.

In a study, children were more likely to be overweight when they watched more television (Gable et al, 2007). According to the National Health Examination Survey, children ages 11-13 have highest rate of daily television viewing. The trend of numerous hours spent in front of the television screen or another form of media reduces the amount of time children spend playing outside and being active or doing another productive activity. The number of calories consumed increases in congruence with the time media is used. Also according to the National Longitudinal Survey of Labor Market Experience, Youth Cohort (NLSY), a strong dose-response relationship was found between television viewing and the prevalence of overweight. Adolescents from 10 to 15 years old who reported watching more than 5 hours of television per day had greater odds of having a BMI in the 85th percentile. This dose-response relationship reported for ages 12 to 17 indicated that every additional hour spent watching television increased the prevalence of obesity by 2 per cent (Brown, 2008).

Buijzen *et al.* (2008) examined the effects of food and beverage advertising on consumption of advertised brands, advertised energy-dense product categories and products overall in a school-based sample of 234 children (4 to 12 Y). The studentsô parents completed four-day food diaries and a survey including questions on their childrenôs television viewing habits. The study found that higher exposure to advertising (based on parentsô reports of viewing habits and advertising broadcast data) was related to greater consumption of advertised brands and energy-dense product categories (sugared breakfast cereals, confectionery, savoury snacks, soft drinks and products from fast-food restaurants) and overall food consumption was not related to advertising exposure but was related to television viewing time. The proportion of food choices from energy-dense product categories was found to be higher among children who spent more time viewing television.

A study conducted at the University of Minnesota in 2009 found an increased incidence of eating in front of the television was primarily due to advertising and reduced metabolic rate in adolescence (Barr-Anderson et al, 2009).

2.5 Eating behaviour and disorders among yough

Becker *et al.* (2002) reported that of the subjects interviewed, 83 per cent of the respondents felt television had specifically influenced their friends and/or themselves to feel differently about or change their body shape or weight; 77 per cent of them reported that television had influenced their own body image. Indeed, they frequently articulated a desire to lose weight or reshape their body in order to become more like a Western television character. Of note, the subjects with high EAT-26 scores or induced vomiting (85%) were more likely had televisionôs influence to pay more attention towards their own body image than subjects without high EAT-26 scores or vomiting (60%).

Nowak and Biittner (2003) examined the relationship between adolescentsô food-related beliefs and food intake behaviours among 902 high school going students from a coastal urban town of Australia. They found strong relationships between: concern about constituents of food and the consumption of those foods; beliefs about food and the consumption of those foods: and beliefs about weight and weight reduction and the related behaviour.

Dieting is a common and widespread practice among adolescents, especially girls. In 1999, 59 per cent of high school girls and 26 per cent of high school boys reported trying to lose weight during the 30 days preceding a national survey. Almost 20 per cent of girls had gone without eating for 24 hours or more to lose weight, 11 per cent had taken diet pills, and 8 per cent had vomited or taken laxatives (Kann *et al*., 2000). Notably, higher weight and overweight teens were engaged in both binge-eating and unhealthy weight control more often than normal weight teens. In fact, 20 per cent of overweight girls and 6 per cent of overweight boys were engaged in using laxatives, vomiting, diuretics, and diet pills. Many of the risk

factors leading to obesity and to eating disorders were similar. These included dieting, self-esteem, media exposure, family meal patterns, eating and health practices of parental role models, exposure to weight related teasing and criticism, food availability in schools, social norms and expectations regarding food intake, exercise, appearance and body image (Neumark-Sztainer *et al*., 2002, 2005). Birmingham and Beaumont (2004) reported that people with anorexia had an 18-fold increase in the risk of death when compared to those of similar age not suffering from the disorder.

2.6 Influence of nutrition transition on youth

Adults who purchased motor scooters/motor bikes or cars to travel to work doubled their likelihood of becoming overweight, in comparison to those that made no change in their mode of transportation (Bell *et al*., 2002).

The nutrition transition patterns were examined from the time period termed receding famine pattern to one dominated by nutrition-related non communicable diseases (NR-NCDs) by Popkin and Larsen (2004) showed that speed of dietary and activity pattern shifts was great particularly in developing world, resulting in major shifts in obesity on a worldwide basis.

Madanat *et al.* (2008) described and analyzed the nutrition transition in Jordan. They showed the nutrition transition is shifting from under-nutrition of a population to a diet high in fat, sugar and refined carbohydrates (over-nutrition) and corresponding premature morbidity and mortality from ensuing chronic disease.

CHAPTER-III

MATERIALS AND METHODS

This chapter encompasses the methods, techniques and various tools used for the present study. The various methodological steps followed in the study have been described along with the relevant details under the following heads and subheads:

3.1 Locale of the study

3.2 Selection of respondents

3.3 Development of questionnaire schedule

3.4 Measurement of dependent and independent variables

3.5 Assessment of nutritional status

- 3.5.1 Anthropometric measurements
- 3.5.2 Dietary intake (24-h recall method)
- 3.5.3 Dietary diversity scores

3.6 Statistical analysis

3.1 Locale of the study

The research was carried out in Gurgaon district from eastern zone of Haryana state. Multistage sampling technique was used wherein at first stage state zone, followed by district and colleges were selected for the study.

3.1.1 Selection of district

Haryana state consists of 21 districts. Out of these districts, from eastern zone Gurgaon being a metropolitan city as required for the study and easily accessible and acquainted to researcher, was selected purposively. Further city area of selected district was taken purposively to have the desired respondents.

3.1.2 Selection of colleges

For the respondents from Govt. College, D.S.D Govt. College of Gurgaon district was selected purposively. For the respondents from private college, DPG Institute of Technology and Management of Gurgaon district was selected purposively.

3.2 Selection of respondents

The present study was conducted on college going youth (18-21y). Total 200 college going students were selected randomly for the study. Out of them 100 students were selected randomly from the D.S.D. Govt. college of Gurgaon and another 100 students were selected randomly from the DPG Institute of Technology and Management which is a Private college in Gurgaon city (Fig. 3.1).

3.3 Development of questionnaire schedule

Keeping in view the objectives of investigation, a well structured questionnaire cum interview schedule was prepared in accordance with methodological procedure and

pre-tested initially on 20 children. Based on the responses, the modifications were made to make it more functional. Interview schedule consisted of questions related to various aspects such as general background of subjects, family type, family size, family income, family education, occupation of family members, health status of family members, food consumption pattern, mass media interaction, food frequency, diet diversity scores and 24 h recall for 2 days. The data were collected by interview cum questionnaire method by paying repeated visits to the study area (college and their home) during the months of April-May, 2012.

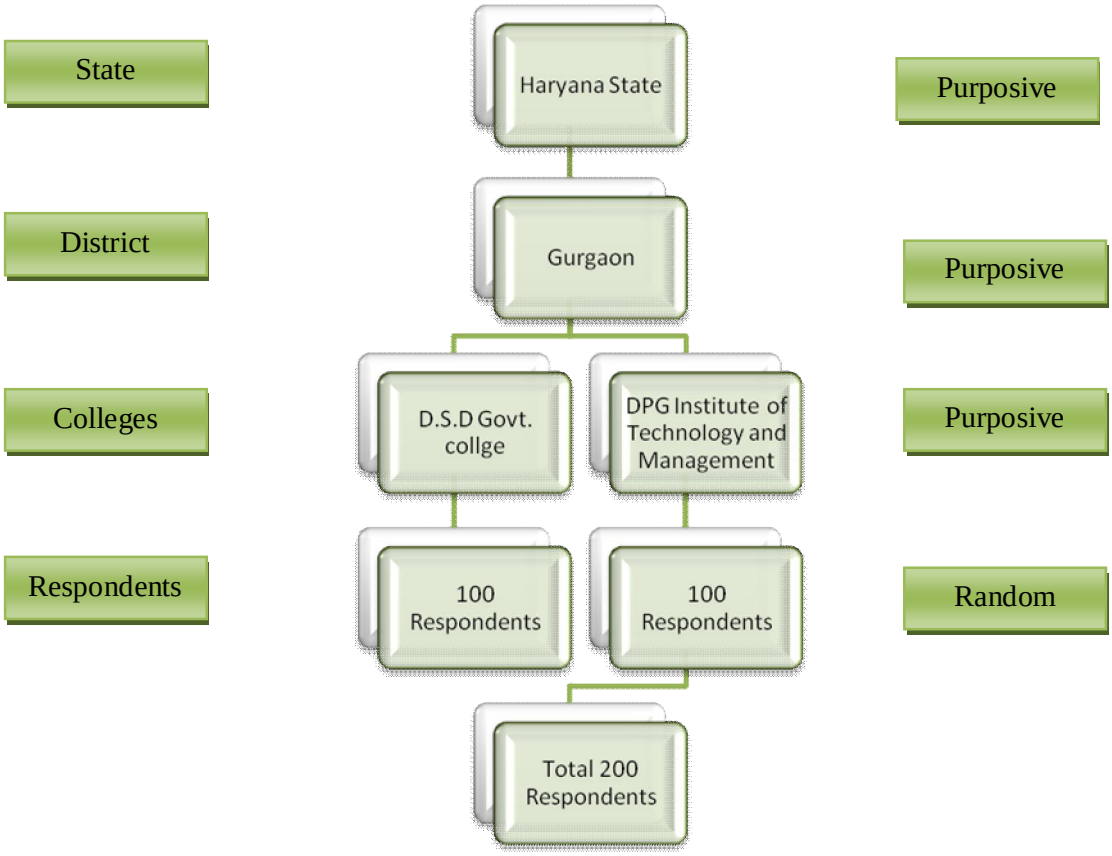

Fig. 3.1 : Flow diagram for selection of the respondents

3.4 Measurement of dependent and independent variables

3.4.1 Sex of child: Following categories were formed and codes were assigned as under:

Sex	Codes
Boys	1
Girls	2

3.4.2 Commuting: It is referred as travel between oneôs place of residence and place of work or full-time study. Codes were given as under:

Commuting Source	Codes
Hostel	1
Day Scholar	2
Daily Commuter	3

3.4.3 Education: In its broadest sense, education is the means through which the aims and habits of a group of people sustain from one generation to the next. Generally, it occurs through any experience that has a formative effect on the way one thinks, feels, or acts. Education was classified as following:

3.4.3.1 School: A school is an institution designed for the teaching of students under the direction of the teachers. Following codes were assigned:

School	Codes
Private	1
Government	2

3.4.3.2 College: It is an educational institution or a constituent part of one. A college may be a degree- awarding tertiary educational institution, an institution within a university, an institution offering vocational education, or a secondary school. Following codes were assigned.

College	Codes
Private	1
Government	2

3.4.3.3 Type of college: College was categorized as under with the respective codes:

College	Codes
Degree College	1
Professional College	2

3.4.4 Residence: It is referred as an establishment where it was originally or currently being used by the host as their main place of dwelling or home.

Residence	Codes
Rural	1
Small City	2
Metropolitan	3

3.4.5 Religion: It is a collection of belief systems, cultural systems, and worldviews that relate humanity to spirituality and, sometimes, to moral values. It was categorized as under with the respective codes:

Religion	Codes
Hindu	1
Muslim	2
Christian	3
Sikh	4

3.4.6 Caste: It refers to the class or distinct hierarchical order of a family in the society. It includes the classification of persons according to certain caste. Codes were given as under:

Caste	Codes
General	1
SC	2
BC	3
OBC	4

3.4.7 Religious: It is relating to or manifesting faithful devotion to an acknowledged ultimate reality or deity. The following categories were made and codes were gives as follows.

Religious	Codes
Very Strictly	1
Liberal	2
Atheist	3

3.4.8 Family type: It depicts, whether it is nuclear or joint family. A nuclear family is composed of members of only one couple and their off springs, while a joint family refers to one which is constituted by two or more brotherôs families. Following codes were assigned.

Type of family	Codes
Joint	1
Nuclear	2

3.4.9 Family size: It is defined as the total number of members in the respondentôs family at the time of data collection. Quantification of the family size was done as per the following scoring pattern.

Family size	Codes
Small (<4 members)	1
Medium (4-6members)	2
Large (>6 members)	3

3.4.10 Family income: It refers to the monthly earning of the family in rupees from all the sources by different family members. Three categories were framed on the basis of actual maximum and minimum income of the respondents.

Family's yearly income (Rs)	Codes
Below 10,000/month	1
10-30,000/month	2
30-60,000/month	3
60,000-1 Lac/month	4
Above 1 Lac/month	5

3.4.11 Educational status of the parents: Education of parents of the respondents was operational as the number of years of formal education attained by them and was categorized as under with the respective codes:

Parent's education	Codes
Illiterate	1
Primary	2
Matric	3
Intermediate	4
Graduate	5
Post-graduate	6

3.4.12 Parent's occupation: Occupation is defined as the profession, in which the parent is engaged in, and is the main source of income. Categories and codes were as given:

Parent's occupation	Codes
Unemployed	1
Labourer	2
Farming	3
Small business and shop	4
Service	5

3.4.13 Health status of parents (in view of respondent): It is referred as the impact of disease on patient function as reported by the patient. More specifically, health status can be defined as the range of manifestation of disease in a given patient including symptoms, functional limitation, and quality of life, in which quality is discrepancy between actual and desired function. The following categories were made and codes given were as follows.

Health status of parents (in view of respondent):	Codes
Fit	1
Underweight	2
Overweight	3
Obese	4

3.4.14 Number of siblings: Siblings are one of two or more individuals having one or both parents in common; a brother or sister. It was categorized as under with the respective codes:

Number of siblings	Codes
0	1
1-2	2
>2	3

3.4.15 Eating habits: It is defined as what and how people eat, their selection of food, their way of getting food. In every part of the world, there is always an influence of environment, religion, economic and culture on eating habits of habitants. It was categorized and codes were given as under.

Eating habits	Codes
Vegetarian	1
Non-vegetarian	2
Egggetarian	3

3.4.16 Meal frequency/Number of meals: It is defined as the number of meals/snacks taken by an individual over a day. The following categories were made and codes were given as under.

Meals	Codes
Early morning	1
Breakfast	2
Lunch	3
Evening Tea	4
Dinner	5

3.5 Assessment of nutritional status

3.5.1 Anthropometric measurements

Prior to the anthropometric measurements, all procedures were explained to the respondent. Under anthropometric measurements, the following parameters in duplicate were measured:

3.5.1.1 Weight: Weight was measured with scale with a precision of 0.1 kg. The scale was placed on a horizontally flat surface. Respondent was weighed barefooted and wearing a minimum of clothing and without touching any other surface or object and the reading was noted. The pointer on the balance scale was adjusted to zero before each weighing (WHO, 2006).

3.5.1.2 Height: Measurement was done with a vertical anthropometric rod. The scale was placed on the flat surface and the respondent was standing without shoes on a horizontal

surface against a wall plane. Measurements were recorded at the nearest 0.1 cm (WHO, 2006).

3.5.1.3 Body Mass Index: Body mass index was calculated from above mentioned measurements i.e. weight and height by employing the given formula (James *et al.* 1988).

$$BMI = \frac{\text{Weight in kg}}{(\text{Height in meter})^2}$$

3.5.1.4 Body fat per cent: The first cutoffs in men and women were 17 and 32 per cent body fat, respectively; the second cutoffs were 21% and 37% body fat, respectively. Overweight was defined as the range between the first and the second cutoffs, and obese was defined as percentage body fat higher than the second cutoff (Kim *et al.* 2012)

3.5.1.5 Waist circumference: Waist circumference is the better indicator of abdominal fat content in children (Deniel *et al.,* 2000) and this method was used to define the central adiposity in children (Taylor *et al.,* 2000). Respondents were asked to wear minimum clothing. Waist circumference was measured to the narrowest point between the lowest rib and the iliac crest, with a flexible non-extensible tape placed directly on the skin while the subject standing balanced on both feet. Readings were taken to the nearest 0.1 mm (Lohman, 1998).

3.5.1.6 Hip circumference: Hip circumference was measured around the widest part of the buttocks at the left, and at the great trochanters at the right, with a flexible non-extensible tape placed parallel to the floor (WHO, 2008).

3.5.1.7 Waist/Hip ratio (WHR) : WHR was calculated by measuring waist circumference and hip circumference and taking their ratio. Cut-off values for waist circumference were 85 cm for men and 80 cm for women, and for WHR they were 0.89 for men and 0.81 for women (Chamukuttan *et al.,* 2003).

3.5.2 Dietary intake (24-h recall method)

The 24-h recall is a method to determine the food intake of an individual during the immediately preceding 24 hours as remembered by the subjects (Den et al., 2006). Food intake was assessed in terms of household measures. The adaptation was consisted of requesting the respondent to use separated known-weight utensils on the recall day to help them visualize the amount of food consumed (Gibson and Ferugson, 1999).To reduce day-to-day variation in the mean intake of nutrient found in high concentration in a few foods, the recall was done on two days (Gibson and Ferugson, 1999). To avoid dependency of intake of 2 consecutive days caused by the use of leftovers, a minimum gap of 2 days and a maximum of 11 days were given between two recall days. Weekend and special events days were excluded.

The total amount of the cooked food and the amount consumed by the respondent were measured in household units, and were used to determine the proportion of the total cooked dish consumed by the respondent (Slimani, 2000).

To estimate the amount of ingredients eaten from dishes and snacks consumed outside the households, standardized recipes of these dishes were determined in triplicate. Three different food vendors were selected. From each vendor the raw ingredients, their amounts, the total uncooked weight and total cooked weight and volume were recorded as well as the number of servings, and the average weight and price of a serving. The method of preparation was also recorded on a separate recipe form. Using this information, the portion of each ingredient eaten by the subjects from these dishes was calculated.

3.5.2.1 Diet intake: The mean daily diet intake was calculated taking mean of two daysô intake. Average daily diet intake was compared with the Recommended Dietary Intake of NIN (2010). Food Adequacy Ratio (FAR) was calculated as follows:

$$FAR = \frac{\text{Intake}}{\text{RDA}} \times 100$$

3.5.2.2 Nutrient intake: The mean daily nutrient intake was calculated taking mean of two days, intake. Nutrient intake of respondents was calculated by using VBS (KOMEET) programme. Average daily nutrient intake was compared with the Recommended Dietary Allowances of NIN (2010). Nutrient Adequacy Ratio (NAR) was calculated as follows:

$$NAR = \frac{\text{Nutrient Intake}}{\text{RDA}} \times 100$$

3.5.3 Diet diversity scores: The method for 24-recall as described by Gibson and Ferguson (1999) was followed. Foods eaten as described in the 24-h recall were subsequently assigned to any one of the 13 food groups used to measure DDS. The following food groups were taken into account: (1) all starchy staples; (2) all legumes and nuts; (3)all dairy; (4) organ meat; (5) eggs; (6) small fish eaten whole with bones; (7) all other flesh foods and miscellaneous small animal protein; (8) vitamin A-rich dark green vegetables; (9) vitamin A-rich yellow, orange and red vegetables; (10) vitamin A-rich fruits; (11) vitamin C-rich vegetables; (12) vitamin C-rich fruits; (13) all other fruits and vegetables. Foods were be assigned to the different groups making use of a food composition table as composed by Arends (2008), which was based upon the food composition table of India and adjusted towards the region of this study.

3.5.4 Statistical analysis: Data coding, entry and validation was done using appropriate software mainly SPSS; ót-test was used for analyzing the data. Frequency and percentages were also calculated.

CHAPTER-IV

RESULTS

The data were collected in accordance with the research methodology to achieve the specific objectives of the study. Results based on the statistical analysis of the data are presented in the following subsection as given below:

4.1 Background information of college going students

4.2 Information regarding mass media interaction

4.3 Programs preferred to be watched on television or internet by college going students

4.4 Information on respondentsô lifestyle and eating habits

4.5 Foods preferred by students in college canteen

4.6 Information regarding meal pattern of college going students

4.7 Information regarding meals taken outside home by the college going students

4.8 Food frequency of the college going students

4.9 Food intake of college going students

4.10 Adequacy of food intake by college going students

4.11 Nutrient intake of college going students

4.12 Adequacy of nutrient intake by college going students

4.13 Diet diversity score of college going students

4.14 Anthropometric measurements of college going students

4.15 Prevalence of underweight, overweight and obesity among college going students

4.1 Background information of college going students

In every study, it is essential to know the background in which enquiry had been conducted. In following paragraph, background information of the respondents has been clearly explained to bring out their characteristic features as presented in Table 4.1 & Fig. 4.1.

General information of college going students under the present study considered the information regarding some important ecological and social-personal variables viz. sex, age, commutation, education, permanent residence, religion, caste/category, religious views, family type, family size, caste, parentôs education, parentôs occupation, parents health, number of siblings, eating habits and meal frequency.

4.1.1 Sex

In the present study, 200 college going children were selected randomly from both the government and private colleges of Gurgaon district. Out of the 200 selected students, 100 were boys; out of them 50 boys were from government college and 50 were from private college. Similarly, total of 100 girls were selected; out of them 50 girls belonged to government college and the rest 50 were from private college.

4.1.2 Age

The age was divided into two groups i.e. 17-18 years and 18-21 years. Among the selected students, 27 per cent students from government college and 18 per cent students from private college were in the 17-18 years age group while there were 72 per cent students from government college and 82 per cent students from the private college who belonged to the 18-21 years age group.

4.1.3 Commutation

The data present in Table 4.1 depicted that most of the students from government college (77%) and private college (60%) were daily commuters; 18 per cent from government college; and 32 and 8per cent from private college were day scholars and hostler, respectively.

4.1.4 Education

Regarding the education of the students, the results revealed that 43 per cent of the government college students and 61 per cent of the private college students had private schooling while the rest did their schooling from government schools. Both the colleges (government and private) were degree colleges.

4.1.5 Permanent residence

From government college, 58, 38 and 4 per cent respondents and from private college there were 42, 28 and 30 per cent respondents who belonged to rural area, small city and metropolitan, respectively.

4.1.6 Religion

Majority of the respondents from government college (99%) and private college (96%) were Hindu while the rest belonged to minority group.

4.1.7 Caste/category

Caste is an independent variable which determines the social status of the respondent. In the present study, most of the respondents were from general (50%) category followed by 10 per cent, 26 per cent and 16 per cent from SC, BC and OBC, respectively in government college. In contrast, 65 per cent respondents from private college belonged to general category, while there were only 7 per cent respondents who were from SC and almost equal percentages (13%and 15%) of respondents were from BC and OBC.

4.1.8 Religious

A higher percentage of respondents from government college (73%) and private college (54%) were liberal religiously followed by 20 per cent (government college) and 43 per cent (private college) who were very strictly religious. Only 7 per cent respondents from government college and 3 per cent from private college were atheist.

4.1.9 Family Type

Type of family was classified in terms of joint and nuclear family. Results revealed that nuclear families in private college (62%) and government college (52%) outnumbered the joint families with 48 per cent in government college and 38 per cent in private college.

4.1.10 Family size

Information on family size indicated that maximum respondents belonged to medium family size in government (79%) and private college (67%), respectively. In government college, 15 per cent respondents belonged to large family size whereas 27 per cent of private college students belonged to large family size. Rest of the respondents had small family.

4.1.11 Family income

A higher percentage (56%) of government college respondents were having family income below Rs.10,000/month which was followed by 41 per cent and 2 per cent respondents with a family income of Rs.10-30,000/month and Rs.30-60,000/month, respectively; only 1 per cent of the respondents had a family income above Rs. 1 Lac/month. No respondents from government college had a family income between Rs.60,000-1 Lac/month. On the other hand, only 15 per cent respondents from private college belonged to family income of below Rs.10,000/month. In private college, higher per cent (48%) of respondentsô families had family income of Rs.30-60,000/month followed by 8 per cent and 3 per cent respondents having family income of Rs.60,000-1 Lac/month and above Rs.1 Lac/month, respectively.

4.1.12 Father's education

The data indicated that only 2 and 4 per cent of government and private college respondentsô fathers were illiterate, respectively. In government college, 15 and 30 per cent of the respondentsô fathers were educated up to matric and primary level, respectively; 34 per cent had education till intermediate; 11 per cent were graduates while only 8 per cent were post graduates. In contrast to it, fathers of private college respondents were mostly graduates (40%); 15 per cent were post graduates; 17 per cent were educated upto intermediate while 16 per cent were educated upto matric level and only 4 per cent had primary level education.

4.1.13 Father's occupation

The data presented in Table 4.1 highlights that in government college, 3 per cent of the respondentsô fathers were unemployed followed by 14 and 20 per cent who were daily wage labourers and farmers by their occupation respectively; 21 per cent were engaged in business while rest (42%) were in service. In private college, results showed that higher percentage (58%) of respondents fathers were engaged in service followed by 22 per cent in business. The percentage of private college respondentsô fathers involved in farming were 14 per cent and no one was a daily wage labourer.

4.1.14 Father's health

As in respondentsô opinion, most of the respondentsô fathers in government (70%) and private (83%) colleges were fit followed by 19 per cent (Govt. college) and 3 per cent, (Private college) who were underweight. In government college, 7 and 4 per cent of the respondents fathers were in the category of overweight and obese, respectively. While in

contrast to it, 11 and 3 per cent of private college respondentsô fathers were overweight and obese, respectively.

4.1.15 Mother's education

The educational status of respondentôs mother highlighted that 23 per cent (Govt. college) and 11 per cent (private college) of respondentsô mothers were illiterate. In government college, 26 and 29 per cent of the respondentsô mothers were educated up to matric and primary level, respectively; 17 per cent had education till intermediate; 3 per cent were graduates while only 2 per cent were post graduates. In contrast to it, mothers of private college respondents were mostly (23%) intermediates followed by those who were matriculate (20%); graduates (19%); educated upto primary level (14%) and post graduates (7%).

4.1.16 Mother's occupation

The results highlighted that most of the respondentsô mothers of both the government (89%) and private (90%) colleges were housewives. In government college, equal percentage (5%) of the respondents mothers were daily wage labourer and in service while only 1 per cent were in business. On the other hand, in private college, ten per cent of the respondentsô mothers were in service.

4.1.17 Mother's health

As in respondentôs opinion, most of the respondentsô mothers in government college (81%) and private college (84%) were fit followed by 10 per cent and 3 per cent who were underweight, respectively. In case of government college respondentsô, 8 per cent of their mothers were overweight while 1 per cent were obese whereas in private college, 13 per cent of the respondentsô mothers were overweight and no one was obese.

4.1.18 Number of siblings

Results in Table 4.1 showed that a higher percentage of respondents from government college (76%) and private college (71%) had one to two siblings. Only 6 per cent respondents from government college and 9 per cent from private college were the only child of their parents.

4.1.19 Eating habits

In both the government and private colleges, most of the respondents i.e. 76 per cent and 72 per cent were vegetarian followed by 18 and 22 per cent who were non-vegetarian, respectively. Equal number of respondents (6%) from both the colleges was eggitarian.

4.1.20 Meal frequency

The results in Table 4.1 highlighted that in government as well as private college, most of the respondents were taking all the 3 meals i.e. breakfast (91% and 88%), lunch (96% and 97%) and dinner (99% in both colleges). In government and private colleges, 54 and 42 per cent of the respondents were having a meal early morning while 42 and 53 per cent of the respondents were taking evening tea too, respectively.

Table 4.1: Background information of college going students

Sr. No.	Variables	College		Total (n=200)
		Govt. College (n=100)	Private College (n=100)	
1.	**Sex**			
	Boys	50 (50)	50 (50)	100 (50)
	Girls	50 (50)	50 (50)	100 (50)
2.	**Age**			
	17-18 years	27(27)	18(18)	45(22.5)
	18-21 years	73(73)	82(82)	155(77.5)
3.	**Commutation**			
	Hostler	5(5)	8(8)	13(6.5)
	Day Scholar	18(18)	32(32)	50(25)
	Daily Commuter	77(77)	60(60)	137(68.5)
4.	**Education**			
	Private schooling	43(43)	61(61)	104(52)
	Govt. schooling	57(57)	39(39)	96(48)
	Private college	0(0)	100(100)	100(50)
	Govt. college	100(100)	0(0)	100(50)
	Degree college	100(100)	100(100)	200(100)
	Professional College	0(0)	0(0)	0(0)
5.	**Permanent residence**			
	Rural	58(58)	42(42)	100(50)
	Small city	38(38)	28(28)	66(33)
	Metropolitan	4(4)	30(30)	34(17)
6.	**Religion**			
	Hindu	99(99)	96(96)	195(97.5)
	Muslim	1(1)	3(3)	5(2.5)
	Christian	0(0)	0(0)	0(0)
	Sikh	0(0)	0(0)	0(0)
7.	**Caste/Category**			
	General	50(50)	65(65)	115(57.5)
	SC	10(10)	7(7)	17(8.5)
	BC	24(24)	13(13)	37(18.5)
	OBC	16(16)	15(15)	31(15.5)
8.	**Religious**			
	Very Strictly	20(20)	43(43)	63(31.5)
	Liberal	73(73)	54(54)	127(63.5)
	Atheist	7(7)	3(3)	10(5)
9.	**Family Type**			
	Joint	48(48)	38(38)	86(43)
	Nuclear	52(52)	62(62)	114(57)

10.	**Family Size**			
	Small (< 4)	6(6)	6(6)	12(6)
	Medium (4-6)	79(79)	67(67)	146(73)
	Large (>6)	15(15)	27(27)	42(21)
11.	**Family income**			
	Below 10,000/month	56(56)	15(15)	71(35.5)
	10-30,000/month	41(37)	48(48)	89(44.5)
	30-60,000/month	2(2)	26(26)	28(14)
	60,000-1 Lac/month	0(0)	8(8)	8(4)
	Above 1 Lac/month	1(1)	3(3)	4(2)
12.	**Father's Education**			
	Illiterate	2(2)	4(4)	6(3)
	Primary	15(15)	8(8)	23(11.5)
	Matric	30(30)	16(16)	46(23)
	Intermediate	34(34)	17(17)	51(25.5)
	Graduate	11(11)	40(40)	51(25.5)
	Post-graduate	8(8)	15(15)	23(11.5)
13.	**Father's Occupation**			
	Unemployed	3(3)	6(6)	9(4.5)
	Laborer	14(14)	0(0)	14(7)
	Farming	20(20)	14(14)	34(17)
	Business	21(21)	22(22)	43(21.5)
	Service	42(42)	58(58)	100(50)
14.	**Father's Health(in respondents opinion)**			
	Fit	70(70)	83(83)	153(76.5)
	Underweight	19(19)	3(3)	22(11)
	Overweight	7(7)	11(11)	18(9)
	Obese	4(4)	3(3)	7(3.5)
15.	**Mother's Education**			
	Illiterate	23(23)	15(15)	38(19)
	Primary	29(29)	14(14)	43(21.5)
	Matric	26(26)	20(20)	46(23)
	Intermediate	17(17)	23(23)	42(21)
	Graduate	3(3)	19(19)	22(11)
	Post-graduate	2(2)	7(7)	9(4.5)
16.	**Mother's Occupation**			
	Housewife	89(89)	90(90)	179(89.5)
	Laborer	5(5)	0(0)	5(2.5)
	Farming	0(0)	0(0)	0(0)
	Business	1(1)	0(0)	1(0.5)
	Service	5(5)	10(10)	15(7.5)

17.	**Mother's Health(in respondents opinion)**			
	Fit	81(81)	84(84)	165(82.5)
	Underweight	10(10)	3(3)	13(6.5)
	Overweight	8(8)	13(13)	21(10.5)
	Obese	1(1)	0(0)	1(0.5)
18.	**Number of Siblings**			
	0	6(6)	9(9)	15(7.5)
	1-2	76(76)	71(71)	147(73.5)
	>2	18(18)	20(20)	38(19)
19.	**Eating habits**			
	Vegetarian	76(76)	72(72)	148(74)
	Non-vegetarian	18(18)	22(22)	40(20)
	Egggetarian	6(6)	6(6)	12(6)
20.	**Meal Frequency**			
	Early morning	54(54)	42(42)	96(48)
	Breakfast	91(91)	88(88)	179(89.5)
	Lunch	96(96)	97(97)	193(96.5)
	Evening Tea	42(42)	53(53)	95(47.5)
	Dinner	99(99)	99(99)	198(99)

Values in parentheses indicate percentage

4.2 Information regarding mass media interaction

Tables 4.2 - 4.5 (Fig. 4.1 - 4.4) reveal the interaction of college going students with mass media. The most preferred sources of information for respondents were TV (82.5%) followed by mobile phones (79.5%), newspaper (52%), internet (38%), radio/FM (27%) in descending order. Very few respondents were reading sports (15%), fashion (7%) and science magazines (6.5%). Most of the respondents (82.5%) were watching TV and out of them a higher percentage of respondents (34%) were watching television daily for 1 hour followed by those who were watching it for 2-3 hours (30%) and more than 3 hours (18.5. There were 16 per cent of the respondents who were watching television once in a few days and those who never watched it were only 1.5 per cent. Next to watching TV, 79.5 per cent of the respondents were using mobile phones. Respondents who used mobile phones for more than 3 hours were 58 per cent followed by 13.5 per cent who were using it for 2-3 hours and only 8 per cent of the students were using it for 1 hour daily; 12 per cent of the respondents were using mobile phones once in a few days while those who never used it were only 8.5 per cent. More than half of the respondents (52%) were reading newspapers and , a higher percentage (48.5%) of them were reading it for 1 hour daily while 3 and 0.5 per cent of them read it for 2-3 hour and more than 3 hour daily, respectively. There were 35 per cent of the respondents who read the newspaper once in a few days and 8.5 per cent of them never read. Sex-wise comparison indicated that more girls (39%) were watching television for 2-3 hours daily as

compared to boys (21%) while almost equal number i.e. one-third of them were watching it for 1 hour daily. On the other hand, there were more boys (65%) than girls (51%) who were using mobile phones more for more than 3 hours daily. Also 18 per cent of the boys and 9 per cent of the girls were using mobile phones for 2-3 hours daily; some of the boys (5%) and girls (13%) did not use mobile phones. Girls (51%) and boys (46%) were reading newspaper for 1 hour daily followed by only 6 per cent and 1per cent of boys who read it for 2-3 hours and more than 3 hours daily, respectively. More number of boys (21%) were using internet (2-3 hours) than girls (10%) whereas equal number of them used it for 1 hour. More number of girls (32%) than boys had no access to internet. More number of girls (42%) than boys (25%) read fashion magazines once in a few days whereas almost equal number of them (43 to 44%) read sports magazines once in a few days. Majority of boys (65%) and girls (52%) did not prefer to read comic books. College-wise comparison showed that almost equal number of respondents from private (35%) and government (33%) colleges watched television for 1 hour daily followed by 34 per cent and 26 per cent watching TV for 2-3 hours. More respondents (21%) from government college than those from private college (18%) watched television for more than 3 hours. More number of respondents from government college than those from private college never used various sources of information viz. internet (37%), mobile phones (13%), newspapers (18%), radio/FM (50%), magazines (43-67%) etc. More number of respondents from private college than from government college used internet once in a few days and used mobile phones for more than 3 hours. There was a higher percentage (51%) of students from government college who were reading newspaper for 1 hour daily than those from private college (42%) while equal percentage (3%) of respondents from both the colleges read the newspaper for 2-3 hours daily and only 1 per cent of the respondents from private college were reading newspaper for more than 3 hours daily.

Table 4.2 : Information regarding mass media interaction

Source	Contact Period		
	Never	Once in a few days	Daily
Television	3(1.5)	32(16)	165(82.5)
Internet	48(24)	76(38)	76(38)
Radio/FM	71(35.5)	75(37.5)	54(27)
Mobile phone	17(8.5)	24(12)	159(79.5)
Newspaper	26(13)	70(35)	104(52)
Fashion magazines	119(59.5)	67(33.5)	14(7)
Science magazines	101(50.5)	86(43)	13(6.5)
Sports magazines	83(41.5)	87(43.5)	30(15)
Comic books	117(58.5)	68(34)	15(7.5)

Values in parentheses indicate percentage

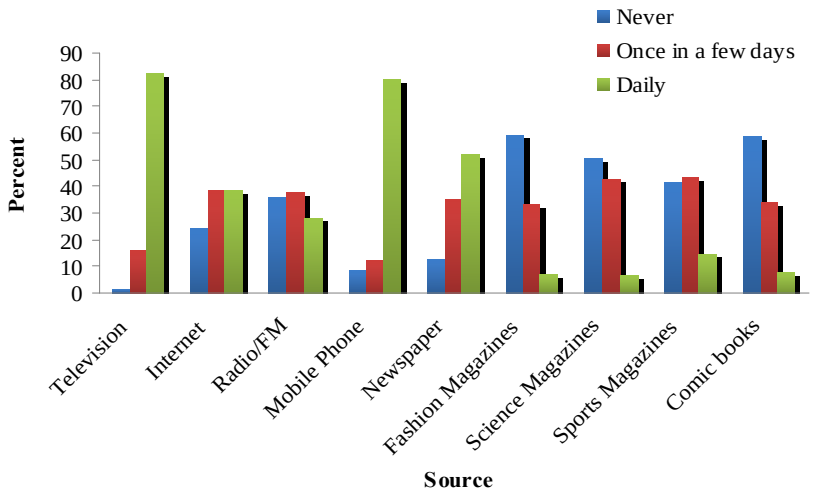

Fig. 4.1: Information regarding mass media interaction

Table 4.3 : Information regarding daily hours spent on mass media

Source	Daily		
	1 hour	2-3 hour	> 3 hours
Television	68(34)	60(30)	37(18.5)
Internet	37(18.5)	31(15.5)	8(4)
Radio/FM	32(16)	15(7.5)	7(3.5)
Mobile phone	16(8)	27(13.5)	116(58)
Newspaper	97(48.5)	6(3)	1(0.5)
Fashion magazines	11(5.5)	2(1)	1(0.5)
Science magazines	13(6.5)	0(0)	0(0)
Sports magazines	24(12)	2(1)	4(2)
Comic books	11(5.5)	3(1.5)	1(0.5)

Values in parentheses indicate percentage

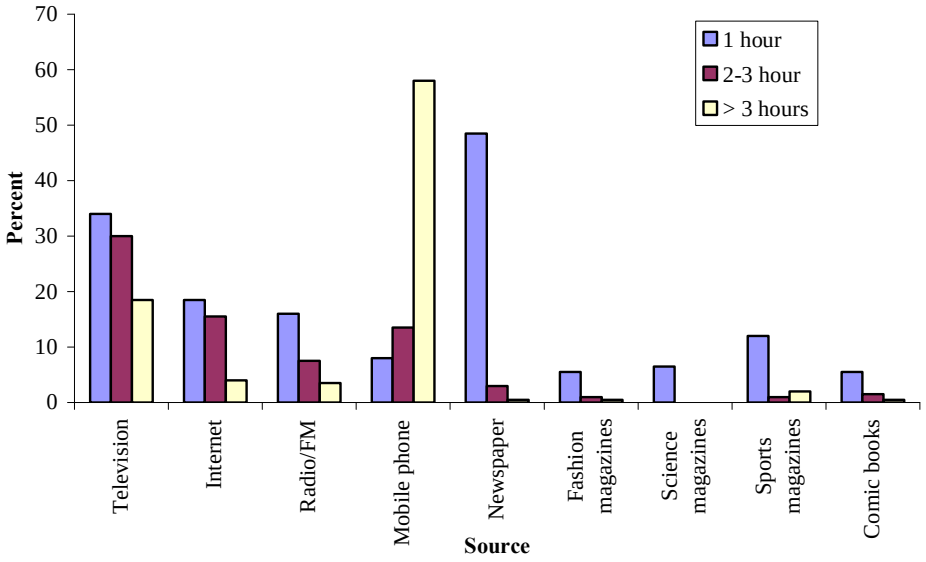

Fig. 4.2 : Information regarding daily hours spent on mass media

Table 4.4 : Sex-wise comparison of mass media interaction

Source	Contact Period									
	Girls (n=100)					Boys (n=100)				
	Never	Once in a few days	Daily			Never	Once in a few days	Daily		
			1 hour	2-3 hour	>3 hours			1 hour	2-3 hour	>3 hours
Television	3(3)	7(7)	35(35)	39(39)	16(16)	0(0)	25(25)	33(33)	21(21)	21(21)
Internet	32(32)	36(36)	19(19)	10(10)	3(3)	16(16)	40(40)	18(18)	21(21)	5(5)
Radio/FM	33(33)	39(39)	22(22)	4(4)	2(2)	38(38)	36(36)	15(15)	9(9)	2(2)
Mobile phone	13(13)	16(16)	11(11)	9(9)	51(51)	4(4)	8(8)	5(5)	18(18)	65(65)
Newspaper	17(17)	32(32)	51(51)	0(0)	0(0)	9(9)	38(38)	46(46)	6(6)	1(1)
Fashion magazines	48(48)	42(42)	8(8)	2(2)	0(0)	71(71)	25(25)	3(3)	0(0)	1(1)
Science magazines	51(51)	42(42)	7(7)	0(0)	0(0)	50(50)	38(38)	12(12)	0(0)	0(0)
Sports magazines	52(52)	43(43)	5(5)	0(0)	0(0)	31(31)	44(44)	19(19)	2(2)	4(4)
Comic books	52(52)	39(39)	7(7)	2(2)	0(0)	65(65)	29(29)	4(4)	1(1)	1(1)

Values in parentheses indicate percentage

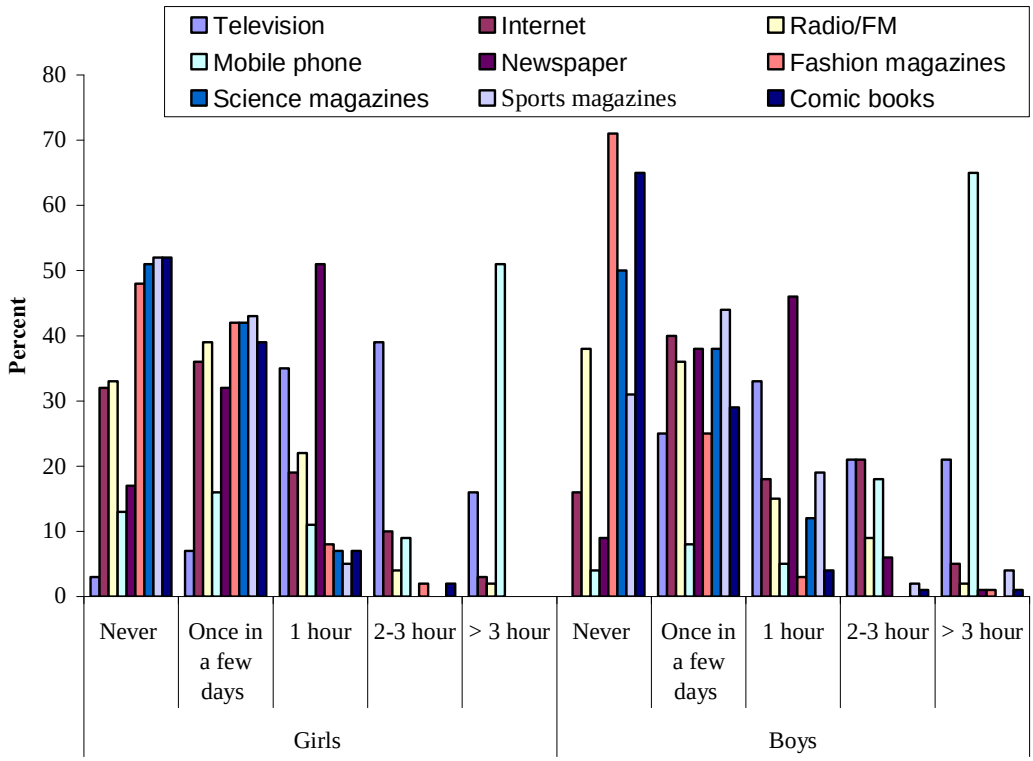

Fig. 4.3 Sex-wise comparison of mass media interaction

Table 4.5 College-wise comparison of mass media interaction

Source	Contact Period									
	Government College (n=100)					Private College (n=100)				
	Never	Once in a few days	Daily			Never	Once in a few days	Daily		
			1 hour	2-3 hour	>3 hours			1 hour	2-3 hour	>3 hours
Television	3(3)	17(17)	33(33)	26(26)	21(21)	0(0)	15(15)	35(35)	34(34)	16(16)
Internet	37(37)	31(31)	14(14)	13(13)	5(5)	11(11)	45(45)	23(23)	18(18)	3(3)
Radio/FM	50(50)	29(29)	17(17)	3(3)	1(1)	21(21)	46(46)	15(15)	12(12)	6(6)
Mobile phone	13(13)	15(15)	10(10)	12(12)	50(50)	4(4)	9(9)	6(6)	15(15)	66(66)
Newspaper	18(18)	28(28)	51(51)	3(3)	0(0)	8(8)	42(42)	46(46)	3(3)	1(1)
Fashion magazines	67(67)	25(25)	8(8)	0(0)	0(0)	52(52)	42(42)	3(3)	2(2)	1(1)
Science magazines	58(58)	32(32)	10(10)	0(0)	0(0)	43(43)	54(54)	3(3)	0(0)	0(0)
Sports magazines	43(43)	39(39)	13(13)	1(1)	4(4)	40(40)	48(48)	11(11)	1(1)	0(0)
Comic books	57(57)	33(33)	9(9)	1(1)	0(0)	60(60)	35(35)	2(2)	2(2)	1(1)

Values in parentheses indicate percentage

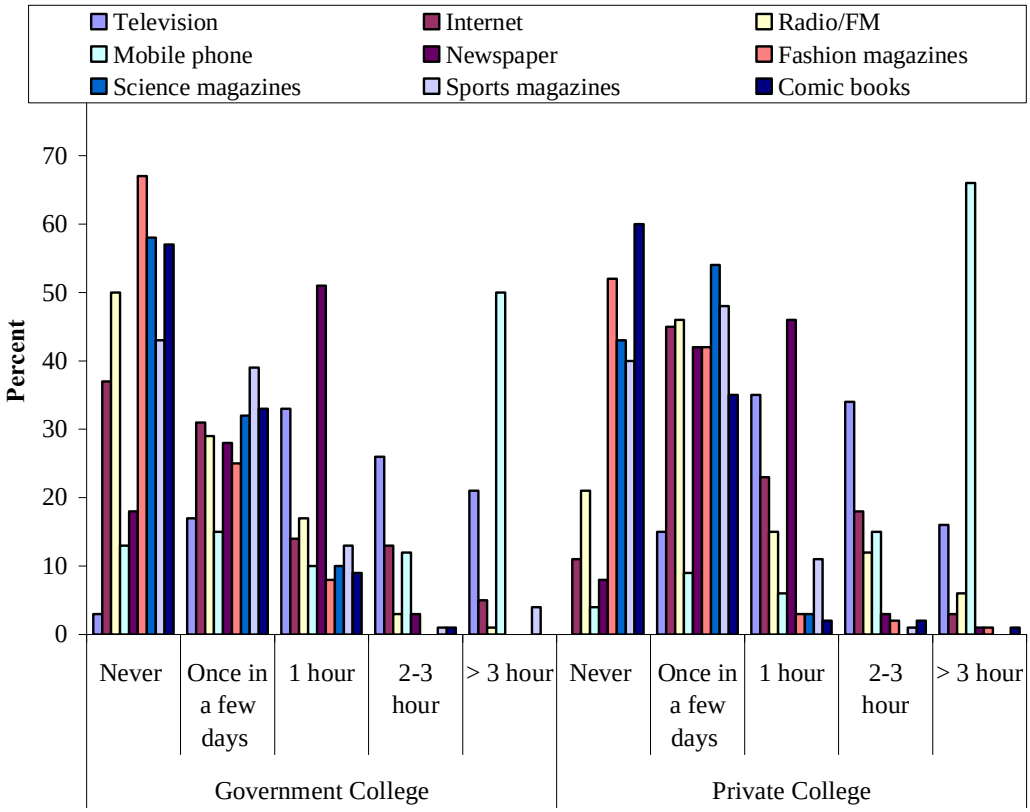

Fig. 4.4 : College-wise comparison of mass media interaction

4.3 Programs preferred to be watched on television or internet

Data in Table 4.6-4.8 (Fig. 4.5-4.7) depicts the programs watched on TV or internet. Results in Table 4.6 highlights that 47, 50.5 and 52.5 per cent of the respondents rarely preferred movies, music videos and TV news while 41.5, 39.5 and 37.5 per cent were watching it very oftenly and almost equal percentage (11.5%, 10% and 10%) of respondents never preferred movies, music videos and TV news, respectively. Sex-wise comparison indicated that almost equal percentage of boys (42%) and girls (41%) watched movies; 39 per cent boys and 40 per cent girls were watching music videos very oftenly. Similarly, almost equal number of girls (51%) and boys (50%) rarely preferred music videos. More girls (46%) preferred watching daily soaps than boys (24%) who were watching more of sports/athletics programs. Most of the boys (43%) watched TV news very oftenly than girls (32%); about half of the boys (49%) and girls (56%) watched news rarely while rest of the girls (12%) and boys (8%) never watched TV news. Table 4.8 revealed that almost equal percent respondents from both the colleges were watching movies, music videos and news very oftenly while a higher percentage of respondents (46%) from private college preferred daily soaps very oftenly than respondents (24%) from government college. Also more number of students from private college (46%) were watching news very oftenly as compared to only 29 per cent respondents from government college. The respondents who did not watch various TV programs, movies, music videos, daily soaps etc. were more in government college than in private college (Table 4.7).

Table 4.6 : Programs preferred to be watched on television or internet by college going students

Programs	Contact Period		
	Never	Rarely	Very often
Movies	23(11.5)	94(47)	83(41.5)
Music videos	20(10)	101(50.5)	79(39.5)
Daily soaps	76(38)	54(27)	70(35)
Sports/Athletics	64(32)	74(37)	62(31)
Science programs	83(41.5)	84(42)	33(16.5)
TV news	20(10)	105(52.5)	75(37.5)
Cartoons	100(50)	60(30)	40(20)

Values in parentheses indicate percentage

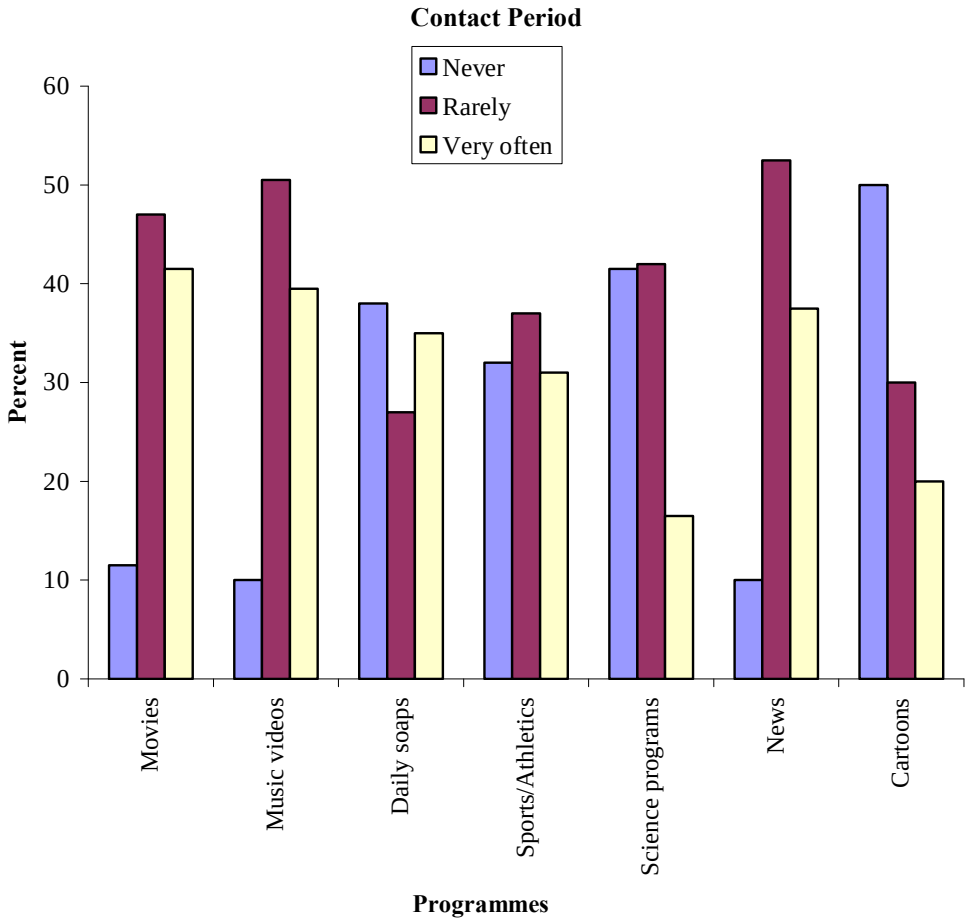

Fig. 4.5: Programs preferred to be watched on television or internet

Table 4.7 : Sex-wise comparisons of programs preferred to be watched on television or internet by college students

Programs	Contact Period					
	Girls (n=100)			Boys (n=100)		
	Never	Rarely	Very often	Never	Rarely	Very often
Movies	10(10)	49(49)	41(41)	13(13)	45(45)	42(42)
Music videos	9(9)	51(51)	40(40)	11(11)	50(50)	39(39)
Daily soaps	19(19)	35(35)	46(46)	57(57)	19(19)	24(24)
Sports/Athletics	49(49)	40(40)	11(11)	15(15)	34(34)	51(51)
Science programs	47(47)	36(36)	17(17)	36(36)	48(48)	16(16)
TV news	12(12)	56(56)	32(32)	8(8)	49(49)	43(43)
Cartoons	42(42)	40(40)	18(18)	58(58)	20(20)	22(22)

Values in parentheses indicate percentage

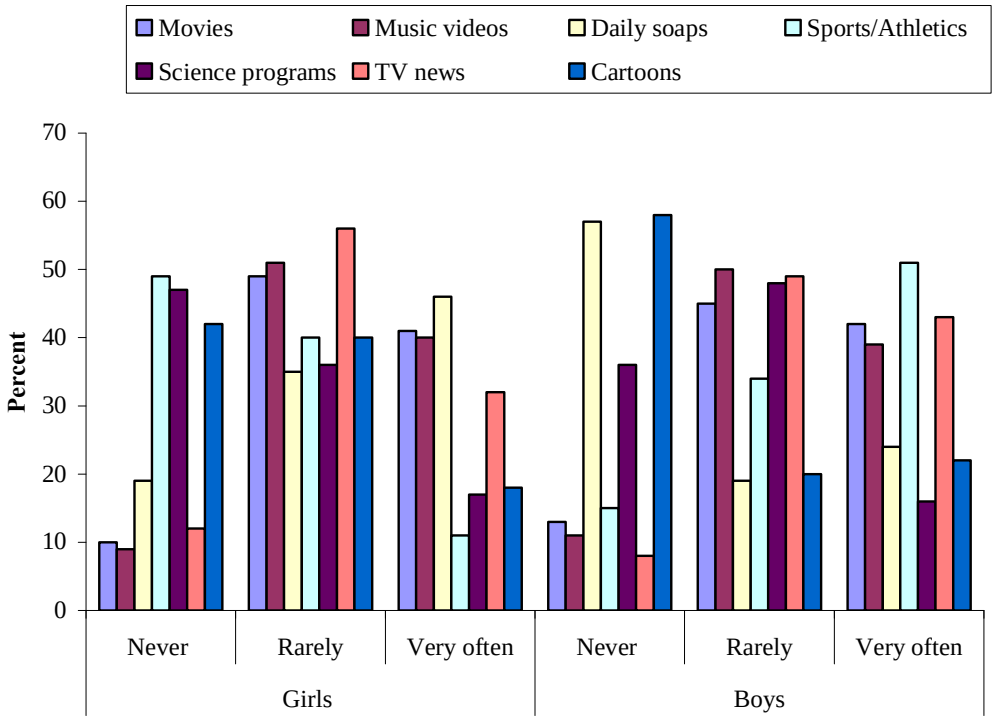

Fig. 4.6 : Sex-wise comparisons of programs preferred to be watched on television or internet by college students

Table 4.8 : College-wise comparisons of programs preferred to be watched on television or internet by college students

Programs	Contact Period					
	Govt. College (n=100)			Private College (n=100)		
	Never	Rarely	Very often	Never	Rarely	Very often
Movies	14(14)	53(53)	33(33)	9(9)	41(41)	50(50)
Music videos	13(13)	56(56)	31(31)	7(7)	45(45)	48(48)
Daily soaps	49(49)	27(27)	24(24)	27(27)	27(27)	46(46)
Sports/Athletics	34(34)	37(37)	29(29)	30(30)	37(37)	33(33)
Science programs	52(52)	37(37)	11(11)	31(31)	47(47)	22(22)
TV news	11(11)	60(60)	29(29)	9(9)	45(45)	46(46)
Cartoons	56(56)	17(17)	27(27)	44(44)	43(43)	13(13)

Values in parentheses indicate percentage

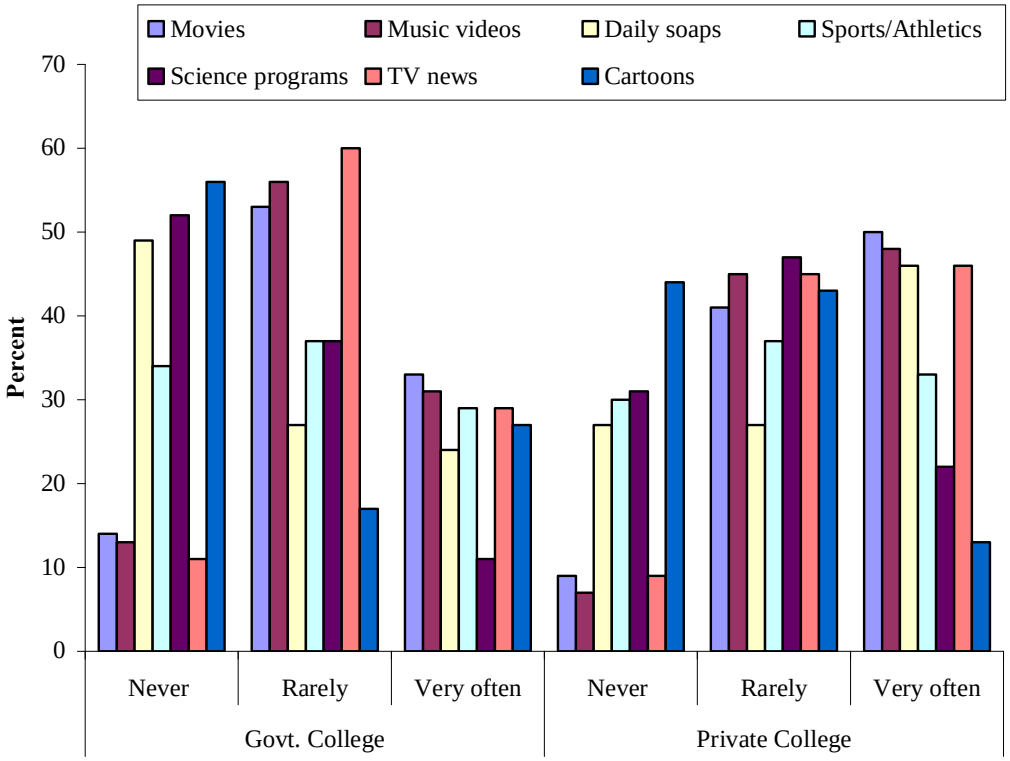

Fig. 4.7 : College-wise comparisons of programs preferred to be watched on television or internet by college students

4.4 Information on respondents' lifestyle and eating habits

Tables 4.9-4.11 depict the information on respondentsô lifestyle and eating habits. Regarding body physique, results revealed that most of the respondents (63%) were satisfied with their body physique/figure and 40 per cent wanted no changes in their body weight while 35.5 and 24.5 per cent of the total respondents wanted to gain weight and lose weight, respectively (Table 4.9 and Fig. 4.8). From both the colleges, most of the respondents were satisfied with their body physique/figure (Table 4.10) while among girls and boys, more boys (67%) than girls (59%) were satisfied (Table 4.11). In private college ,more respondents wanted to lose weight (29%) and gain weight (39%) than respondents from government college. A higher percentage from government college (48%) wanted no changes in body figure as compared to those in private college (32%). More number of girls (32%) wanted to lose weight than boys (17%) who wanted to gain weight more (46%) than the girls (25%); rest of the boys (37%) and girls (43%) wanted no change in their body figure (Table 4.11)

A higher percentage (43.5%) of the college going students thought that TV models have a perfect body physique/figure while 31.5 per cent were not sure about it and rest (25%) did not agree to it. A higher percentage of the respondents from government college than those from private college thought that TV models have a perfect body physique/figure. More

of the boys (67%) than girls (47%) thought that TV models have a perfect body physique followed by 23 per cent boys and 40 per cent girls who were not. On the contrary to this, almost half of the total respondents, 45 per cent from government college and 54 per cent from private college, 45 per cent boys and 54 per cent girls did not feel motivated to lose weight by watching TV models; 28.5 per cent were not sure about it while the remaining 22 per cent felt motivated. Also there were respondents who wanted to attain a figure like a fashion model (33.5%), any of their neighbours (8.5%) and their friend (22%) type. More number of respondents (35%) from private college wanted to attain a body figure like fashion model than those from government college (32%) who wanted to be like their friends (27%) in body physique as compared to only 17 per cent from private college. Some of the boys (37%) and girls (23%) wanted a physique like a fashion model. Almost equal per cent of boys (23%) and girls (21%) wanted to have a figure as that of their friends.

Thirty three per cent of the respondents skipped meals after watching/ reading a fashion programme/article/magazine while 67 per cent of them never did this. More number of the respondents from government college (41%) than the private college respondents (25%); more girls (38%) than boys (28%) skipped meals after watching/ reading a fashion programme/article/magazine. Results also revealed that 78 per cent students never considered self induced vomiting to lose weight while only 22 per cent tried it and they got this idea from media (1.5%), friends (7%), family (2.5%) and all of them (11%). Alongwith this, 26.5 per cent college going students tried dieting to lose weight because of reading an article in a magazine/watching TV program while a higher percentage (73.5%) did not do so. Respondents from government (31%) as well as from private college (22%); both girls (29%) and boys (24%) tried dieting to lose weight because of reading an article in a magazine/ watching TV program.

Only 42.5 per cent of the students started exercise; 30.5 per cent joined a gym/fitness centre because of an article in a magazine or TV program. On the other hand 57.5 and 69.5 per cent of the students never started exercise and joined a gym/fitness centre because of mass media exposure. The college and sex-wise comparison indicated that an almost equal percentage of respondents from government (43%) and private (42%) colleges started exercise while more boys (49% and 38%) than girls (36% and 23%) started doing exercise after reading an article in a magazine or watching TV program and joined a gym/fitness centre because of mass media exposure.

Most of the respondents (89%) never took alcohol while only 11 per cent of the respondents took alcohol for gaining weight (3.5%) and taste (7.5%). As compared to private college (6%), more respondents from government college (16%) took alcohol. Similarly, more boys (16%) than girls (6%) were consuming alcohol. Two per cent of the girls took it

for gaining weight as compared to 5 per cent of the boys while 4 per cent girls as compared to 6 per cent of boys who consumed it for taste.

A higher percentage (47.5%) of respondents sometimes tried new food products after watching advertisements while 29 per cent never did so; only 23.5 per cent always did Almost equal percentage of respondents and from government (23%) and private colleges (24%); more girls (28%) than boys (19%) tried new food products after watching advertisements. Results also revealed that 63 per cent respondents thought that advertisement of junk food product/beverage caused an increase in their intake among youth; rest 37 per cent denied it. Majority of the respondents (59.5%) felt that the presence of a particular fashion/film model/figure in advertisements affects consumption of the advertised food/drink while 40.5 per cent of them never felt so. Regarding it, not much difference was found among government (61%) and private college (59%) students while more boys (62%) than girls (57%) thought that the presence of a particular fashion/film model/figure in advertisement affected the consumption of the advertised food/drink.

Snacking while watching TV, working on net, reading leisurely, all of them and none of them were seen in 45, 7, 5.5, 21 and 21.5 per cent of the respondents, respectively. From government college, higher percentage of the respondents (49%) took snacks while watching TV than private college (41%). More girls (50%) than boys were taking snacks while watching TV. The students rarely tried new food products after knowing it from TV commercials (43%), newspaper/newsletter/pamphlets (50%) and advertisement in supermarkets (44%) while they tried it very oftenly after knowing it from friends (52.5%) and never after knowing it from internet (45%). Almost equal percentage from government (52%) and private college (53%) tried new food products after knowing it from friends. Similarly, both girls (51%) and boys (54%) also tried new food products after knowing it from friends.

Regarding eating habits, results highlighted that respondents visited food store/food joints/superstores/marts monthly (32%), weekly (28.5%), rarely (23%) and daily (16.5%). Equal percentage (32%) of respondents from both the colleges visited monthly and more respondents from private college (34%) than government college (23%) visited food store/food joints/superstores/marts weekly. Only 13.5 per cent of the respondents always purchased ready to eat products while 26 per cent of them never did so and rest (60.5%) of them sometimes purchased it. More respondents from private college (16%) always purchased ready to eat products as compared to government college (11%). Most of the respondents (38%) sometimes ate without hunger followed by 32.5 per cent who never did this and almost equal percentage ate without hunger very oftenly and rarely. More girls (18%) very oftenly ate without hunger as compared to 12 per cent boys while more boys (51%) sometimes ate without hunger as compared to the girls (25%).

Table 4.9 : Information on respondents' lifestyle and eating habits

What do respondent think?		Total (n=200)
Are you satisfied with your body physique/figure?	Yes	126(63)
	No	74(37)
You would like to	Lose weight	49(24.5)
	Gain weight	71(35.5)
	No changes	80(40)
Do you think that TV models have a perfect body physique/figure?	Yes	87(43.5)
	No	50(25)
	Not sure	63(31.5)
Do you feel motivated to lose weight by watching TV models?	Yes	44(22)
	No	99(49.5)
	Not sure	57(28.5)
What type of figure you desire to attain?	A fashion model	67(33.5)
	Any of your neighbor	17(8.5)
	Your friend	44(22)
	None	72(36)
Do you skip meals after watching/reading a fashion program/article/magazine?	Yes	66(33)
	No	134(67)
Have you ever considered self induced vomiting to lose weight?	Yes	44(22)
	No	156(78)
If yes, from where did you get this idea?	Media	3(1.5)
	Friend	14(7)
	Family	5(2.5)
	All	22(11)
Have you ever gone on diet to lose weight because of an article in a magazine/TV program?	Yes	53(26.5)
	No	147(73.5)
Have you ever started exercise because of an article in a magazine article or TV program?	Yes	85(42.5)
	No	115(57.5)
Did you ever join a gym/fitness centre because of any TV program or an article?	Yes	61(30.5)
	No	139(69.5)
Do you take alcohol?	Yes	22(11)
	No	178(89)
If yes, you take alcohol for	Gaining weight	7(3.5)
	Taste	15(7.5)
Do you try new food products after watching ads?	Yes	47(23.5)
	No	58(29)
	Sometimes	95(47.5)

Do you agree that junk food product/beverage ads cause in their increase intake among youth?	Yes	126(63)
	No	74(37)
What do you think that presence of a particular fashion/film model/figure in ad affects consumption of the advertised food/drink?	Yes	119(59.5)
	No	81(40.5)
You take snacks while	Watching TV	90(45)
	Working on net	14(7)
	Reading leisurely	11(5.5)
	All	42(21)
	None	43(21.5)
You usually tend to try new food products after knowing it from		
a) TV commercial	Very often	58(29)
	Rarely	86(43)
	Never	56(28)
b) Internet	Very often	30(15)
	Rarely	80(40)
	Never	90(45)
c) Newspaper/Newsletter/Pamphlets	Very often	46(23)
	Rarely	100(50)
	Never	54(27)
d) Friends	Very often	105(52.5)
	Rarely	70(35)
	Never	25(12.5)
e) Ads in supermarkets	Very often	41(20.5)
	Rarely	88(44)
	Never	71(35.5)
Eating habits		
How often do you visit food store/food joints/superstores/marts?	Daily	33(16.5)
	Weekly	57(28.5)
	Monthly	64(32)
	Rarely	46(23)
Do you buy ready to eat foods?	Always	27(13.5)
	Never	52(26)
	Sometimes	121(60.5)
Do you eat without hunger?	Very often	30(15)
	Sometimes	76(38)
	Rarely	29(14.5)
	Never	65(32.5)

Values in parentheses indicate percentage

Table 4.10 : Sex-wise comparison of the lifestyle and eating habits of college going students

What do respondent think?		Girls (n=100)	Boys (n=100)	Total (n=200)
Are you satisfied with your body physique/figure?	Yes	59(59)	67(67)	126(63)
	No	41(41)	33(33)	74(37)
You would like to	Lose weight	32(32)	17(17)	49(24.5)
	Gain weight	25(25)	46(46)	71(35.5)
	No changes	43(43)	37(37)	80(40)
Do you think that TV models have a perfect body physique/figure?	Yes	47(47)	64(64)	87(43.5)
	No	22(22)	28(28)	50(25)
	Not sure	40(40)	23(23)	63(31.5)
Do you feel motivated to lose weight by watching TV models?	Yes	16(16)	28(28)	44(22)
	No	54(54)	45(45)	99(49.5)
	Not sure	37(37)	20(20)	57(28.5)
What type of figure you desire to attain?	A fashion model	30(30)	37(37)	67(33.5)
	Any of your neighbor	9(9)	8(8)	17(8.5)
	Your friend	21(21)	23(23)	44(22)
	None	40(40)	32(32)	72(36)
Do you skip meals after watching/reading a fashion program/article/magazine?	Yes	38(38)	28(28)	66(33)
	No	66(66)	76(76)	134(67)
Have you ever considered self induced vomiting to lose weight?	Yes	23(23)	21(21)	44(22)
	No	77(77)	79(79)	156(78)
If yes, from where did you get this idea?	Media	1(1)	2(2)	3(1.5)
	Friend	6(6)	8(8)	14(7)
	Family	2(2)	3(3)	5(2.5)
	All	12(12)	10(10)	22(11)
Have you ever gone on diet to lose weight because of an article in a magazine/TV program?	Yes	29(29)	24(24)	53(26.5)
	No	71(71)	84(84)	147(73.5)
Have you ever started exercise because of an article in a magazine article or TV program?	Yes	36(36)	49(49)	85(42.5)
	No	65(65)	50(50)	115(58)
Did you ever join a gym/fitness centre because of any TV program or an article?	Yes	23(23)	38(38)	61(30.5)
	No	77(77)	62(62)	139(69.5)
Do you take alcohol?	Yes	6(6)	16(16)	22(11)
	No	94(94)	84(84)	178(89)
If yes, you take alcohol for	Gaining weight	2(2)	5(5)	7(3.5)
	Taste	4(4)	11(11)	15(7.5)

Do you try new food products after watching ads?	Yes	28(28)	19(19)	47(23.5)
	No	25(25)	33(33)	58(29)
	Sometimes	47(47)	48(48)	95(47.5)
Do you agree that junk food product/beverage ads cause in their increase intake among youth?	Yes	61(61)	65(65)	126(63)
	No	39(39)	35(35)	74(37)
What do you think that presence of a particular fashion/film model/figure in ad affects consumption of the advertised food/drink?	Yes	57(57)	62(62)	119(59.5)
	No	43(43)	38(38)	81(40.5)
You take snacks while	Watching TV	50(50)	40(40)	90(45)
	Working on net	5(5)	9(9)	14(7)
	Reading leisurely	4(4)	5(5)	11(5.5)
	All	30(30)	12(12)	42(21)
	None	11(11)	32(32)	43(21.5)
You usually tend to try new food products after knowing it from				
a) TV commercial	Very often	30(30)	28(28)	58(29)
	Rarely	44(44)	42(42)	86(43)
	Never	26(26)	30(30)	56(28)
b) Internet	Very often	14(14)	16(16)	30(15)
	Rarely	38(38)	42(42)	80(40)
	Never	48(48)	42(42)	90(45)
c) Newspaper/Newsletter/Pamphlets	Very often	26(26)	20(20)	46(23)
	Rarely	49(49)	51(51)	100(50)
	Never	25(25)	29(29)	54(27)
d) Friends	Very often	51(51)	54(54)	105(52.5)
	Rarely	38(38)	32(32)	70(35)
	Never	11(1)	14(14)	25(12.5)
e) Ads in supermarkets	Very often	21(21)	20(20)	41(20.5)
	Rarely	41(41)	47(47)	88(44)
	Never	38(38)	33(33)	71(35.5)
Eating habits				
How often do you visit food store/food joints/superstores/marts?	Daily	17(7)	16(16)	33(16.5)
	Weekly	28(28)	29(29)	57(28.5)
	Monthly	33(33)	31(31)	64(32)
	Rarely	22(22)	24(24)	46(23)
Do you buy ready to eat foods?	Always	11(11)	16(16)	27(13.5)
	Never	29(29)	23(23)	52(26)
	Sometimes	60(60)	61(61)	121(60.5)
Do you eat without hunger?	Very often	18(18)	12(12)	30(15)
	Sometimes	25(25)	51(51)	76(38)
	Rarely	26(26)	3(3)	29(14.5)
	Never	31(31)	34(34)	65(32.5)

Values in parentheses indicate percentage

Table 4.11 : College-wise comparison of the lifestyle and eating habits of college going students

What do respondent think?		Govt. college (n=100)	Private college (n=100)	Total (n=200)
Are you satisfied with your body physique/figure?	Yes	65(65)	61(61)	126(63)
	No	35(35)	39(39)	74(37)
You would like to	Lose weight	20(20)	29(29)	49(24.5)
	Gain weight	32(32)	39(39)	71(35.5)
	No changes	48(48)	32(32)	80(40)
Do you think that TV models have a perfect body physique/figure?	Yes	48(48)	39(39)	87(43.5)
	No	16(16)	34(34)	50(25)
	Not sure	36(36)	27(27)	63(31.5)
Do you feel motivated to lose weight by watching TV models?	Yes	21(21)	23(23)	44(22)
	No	45(45)	54(54)	99(49.5)
	Not sure	34(34)	23(23)	57(28.5)
What type of figure you desire to attain?	A fashion model	32(32)	35(35)	67(33.5)
	Any of your neighbor	9(9)	8(8)	17(8.5)
	Your friend	27 (27)	17(17)	44(22)
	None	32(32)	40(40)	72(36)
Do you skip meals after watching/reading a fashion program/article/magazine?	Yes	41(41)	25(25)	66(33)
	No	59(59)	75(75)	134(67)
Have you ever considered self induced vomiting to lose weight?	Yes	23(23)	21(21)	44(22)
	No	77(77)	79(79)	156(78)
If yes, from where did you get this idea?	Media	0(0)	3(3)	3(1.5)
	Friend	7(7)	7(7)	14(7)
	Family	3(3)	2(2)	5(2.5)
	All	13(13)	9(9)	22(11)
Have you ever gone on diet to lose weight because of an article in a magazine/TV program?	Yes	31(31)	22(22)	53(26.5)
	No	69(69)	78(78)	147(73.5)
Have you ever started exercise because of an article in a magazine article or TV program?	Yes	43(43)	42(42)	85(42.5)
	No	57(57)	58(58)	115(57.5)
Did you ever join a gym/fitness centre because of any TV program or an article?	Yes	32(32)	29(29)	61(30.5)
	No	68(68)	71(71)	139(69.5)
Do you take alcohol?	Yes	16(16)	6(6)	22(11)
	No	84(84)	94(94)	178(89)
If yes, you take alcohol for	Gaining weight	4(4)	3(3)	7(3.5)
	Taste	12(12)	3(3)	15(7.5)

Do you try new food products after watching ads?	Yes	23(23)	24(24)	47(23.5)
	No	30(30)	28(28)	58(29)
	Sometimes	47(47)	48(48)	95(47.5)
Do you agree that junk food product/beverage ads cause in their increase intake among youth?	Yes	57(57)	69(69)	126(63)
	No	43(43)	31(31)	74(37)
What do you think that presence of a particular fashion/film model/figure in ad affects consumption of the advertised food/drink?	Yes	61(61)	58(58)	119(59.5)
	No	39(39)	42(42)	81(40.5)
You take snacks while	Watching TV	49(49)	41(41)	90(45)
	Working on net	6(6)	8(8)	14(7)
	Reading leisurely	8(8)	3(3)	11(5.5)
	All	14(14)	28(28)	42(21)
	None	23(23)	20(20)	43(21.5)
You usually tend to try new food products after knowing it from				
a) TV commercial	Very often	33(33)	25(25)	58(29)
	Rarely	28(28)	58(58)	86(43)
	Never	39(39)	17(17)	56(28)
b) Internet	Very often	15(15)	15(15)	30(15)
	Rarely	28(28)	52(52)	80(40)
	Never	57(57)	33(33)	90(45)
c) Newspaper/Newsletter/Pamphlets	Very often	25(25)	21(21)	46(23)
	Rarely	49(49)	51(51)	100(50)
	Never	26(26)	28(28)	54(27)
d) Friends	Very often	52(52)	53(53)	105(52.5)
	Rarely	41(41)	29(29)	70(35)
	Never	7(7)	18(18)	25(12.5)
e) Ads in supermarkets	Very often	19(19)	22(22)	41(20.5)
	Rarely	43(43)	45(45)	88(44)
	Never	38(38)	33(33)	71(35.5)
Eating habits				
How often do you visit food store/food joints/superstores/marts?	Daily	17(17)	16(16)	33(16.5)
	Weekly	23(23)	34(34)	57(28.5)
	Monthly	32(32)	32(32)	64(32)
	Rarely	28(28)	18(18)	46(23)
Do you buy ready to eat foods?	Always	11(11)	16(16)	27(13.5)
	Never	25(25)	27(27)	52(26)
	Sometimes	64(64)	57(57)	121(60.5)
Do you eat without hunger?	Very often	16(16)	14(14)	30(15)
	Sometimes	39(39)	37(37)	76(38)
	Rarely	8(8)	21(21)	29(14.5)
	Never	37(37)	28(28)	65(32.5)

Values in parentheses indicate percentage

4.5 Foods preferred by students in college canteen

Table 4.12-4.14 (Fig. 4.8-4.10) highlights the foods preferred by students in college canteen. *Samosa/bread pakora* (39.5%), fresh juice (30%) and tea/coffee (28%) were the foods taken very oftenly by the respondents followed by potato chips (38.5%), cold drinks (37.5%), burger (34.5%) , noodles (32.5%) and patties (29%) which were preferred sometimes. RTS was rarely preferred by students (33%) while *dosa* (41%) and pizza (42.5%) were not available in college canteen. More respondents from private college (42%) preferred *samosa/bread pakora* very oftenly as compared to the respondents from government college (37%) while almost equal percentage of respondents from both the colleges preferred fresh juice (30% to 31%) and tea/coffee (27% to 29%). Private college respondents sometimes preferred cold drink (46%) and noodles (36%) more than those from government college who were taking patties (37%) more than those from private college students (21%). Almost equal percentage of girls (39%) and boys (40%) were eating *samosa/bread pakora* very oftenly while more boys (39%) than girls (26%) preferred cold drinks. On the other hand, tea/coffee was preferred very oftenly by girls (37%) as compared to boys (19%). Also more girls (45%) than boys (18%) were eating noodles sometimes. A higher percentage of boys (43%) very oftenly preferred fresh juice in college canteen as compared to girls (18%).

Table 4.12 : Foods preferred by students in college canteen

Foods	Frequency (n=200)				
	Very often	Sometimes	Rarely	Never	Not available
Dosa	13(6.5)	37(18.5)	23(11.5)	45(22.5)	82(41)
Noodles	20(10)	63(32.5)	33(16.2)	44(22)	40(20)
Parantha	27(13.5)	58(29)	22(11)	55(27.5)	38(19)
Burger	22(11)	69(34.5)	30(15)	49(24.5)	30(15)
Patty	29(14.8)	58(29)	42(21)	34(17)	37(18.5)
Pizza	13(6.5)	30(15)	31(15.5)	41(21)	85(42.5)
Samosa/bread pakora	79(39.5)	62(31)	39(19.5)	19(9.5)	1(0.5)
Sandwich	42(21)	57(28.5)	26(13)	55(27.5)	20(10)
Pastry	17(8.5)	52(26)	29(19.5)	43(21.5)	59(29.5)
Potato chips/fries	55(27.5)	77(38.5)	26(13)	35(17.5)	7(3.5)
Milkshake	30(15)	48(24)	21(10.5)	56(28)	45(27.5)
Cold drink	65(32.5)	75(37.5)	40(20)	20(10)	0(0)
Fresh juice	61(30.1)	49(24.5)	26(13)	23(11.5)	41(20.5)
RTS juice	21(10.5)	22(11)	66(33)	35(17.5)	56(28)
Tea/Coffee	56(28)	40(20)	29(14.5)	68(34)	7(3.5)

Values in parentheses indicate percentage

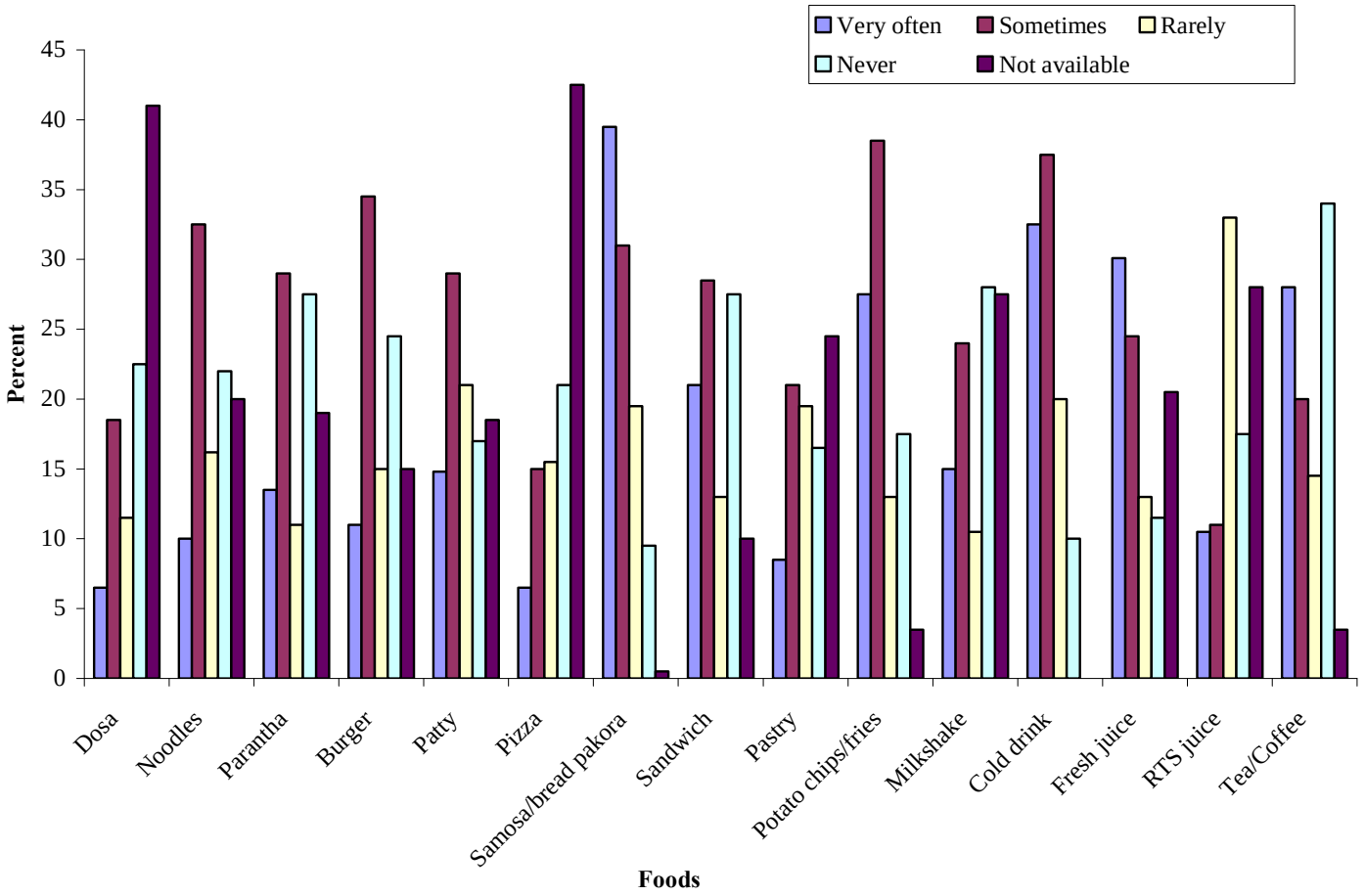

Fig. 4.8 : Foods preferred by students in college canteen

Table 4.13 : Sex-wise comparison of foods preferred by students in college canteen

Foods	Frequency (n=200)									
	Girls (n=100)					Boys (n=100)				
	Very often	Sometimes	Rarely	Never	Not available	Very often	Sometimes	Rarely	Never	Not available
Dosa	6(6)	20(20)	8(8)	23(23)	43(43)	7(7)	17(17)	15(15)	22(22)	39(39)
Noodles	8(8)	45(45)	13(13)	18(18)	16(16)	12(12)	18(18)	20(20)	26(26)	24(24)
Parantha	18(18)	33(33)	16(16)	22(22)	11(11)	9(9)	25(25)	6(6)	33(33)	27(27)
Burger	8(8)	30(30)	14(14)	28(28)	20(20)	14(14)	39(39)	16(16)	21(21)	10(10)
Patty	11(11)	17(17)	21(21)	27(27)	24(24)	18(18)	41(41)	21(21)	7(7)	13(13)
Pizza	9(9)	18(18)	8(8)	26(26)	39(39)	4(4)	12(12)	23(23)	15(15)	46(46)
Samosa/bread pakora	39(39)	29(29)	23(23)	9(9)	0(0)	40(40)	33(33)	16(16)	10(10)	1(1)
Sandwich	19(19)	31(31)	15(15)	26(26)	9(9)	23(23)	26(26)	11(11)	29(29)	11(11)
Pastry	9(9)	28(28)	22(22)	16(16)	25(25)	8(8)	24(14)	7(7)	27(27)	34(34)
Potato chips/fries	25(25)	42(42)	18(18)	13(13)	2(2)	30(30)	35(35)	8(8)	22(22)	5(5)
Milkshake	16(16)	18(18)	11(11)	30(30)	25(25)	14(14)	30(30)	10(10)	26(26)	20(20)
Cold drink	26(26)	48(48)	17(17)	9(9)	0(0)	39(39)	27(27)	23(23)	11(11)	0(0)
Fresh juice	18(18)	31(31)	19(19)	12(12)	20(20)	43(43)	18(18)	7(7)	11(11)	21(21)
RTS juice	13(13)	16(16)	17(17)	40(40)	14(14)	8(8)	6(6)	39(39)	5(5)	42(42)
Tea/Coffee	37(37)	19(19)	16(16)	25(25)	3(3)	19(19)	21(21)	13(13)	43(43)	4(4)

Values in parentheses indicate percentage

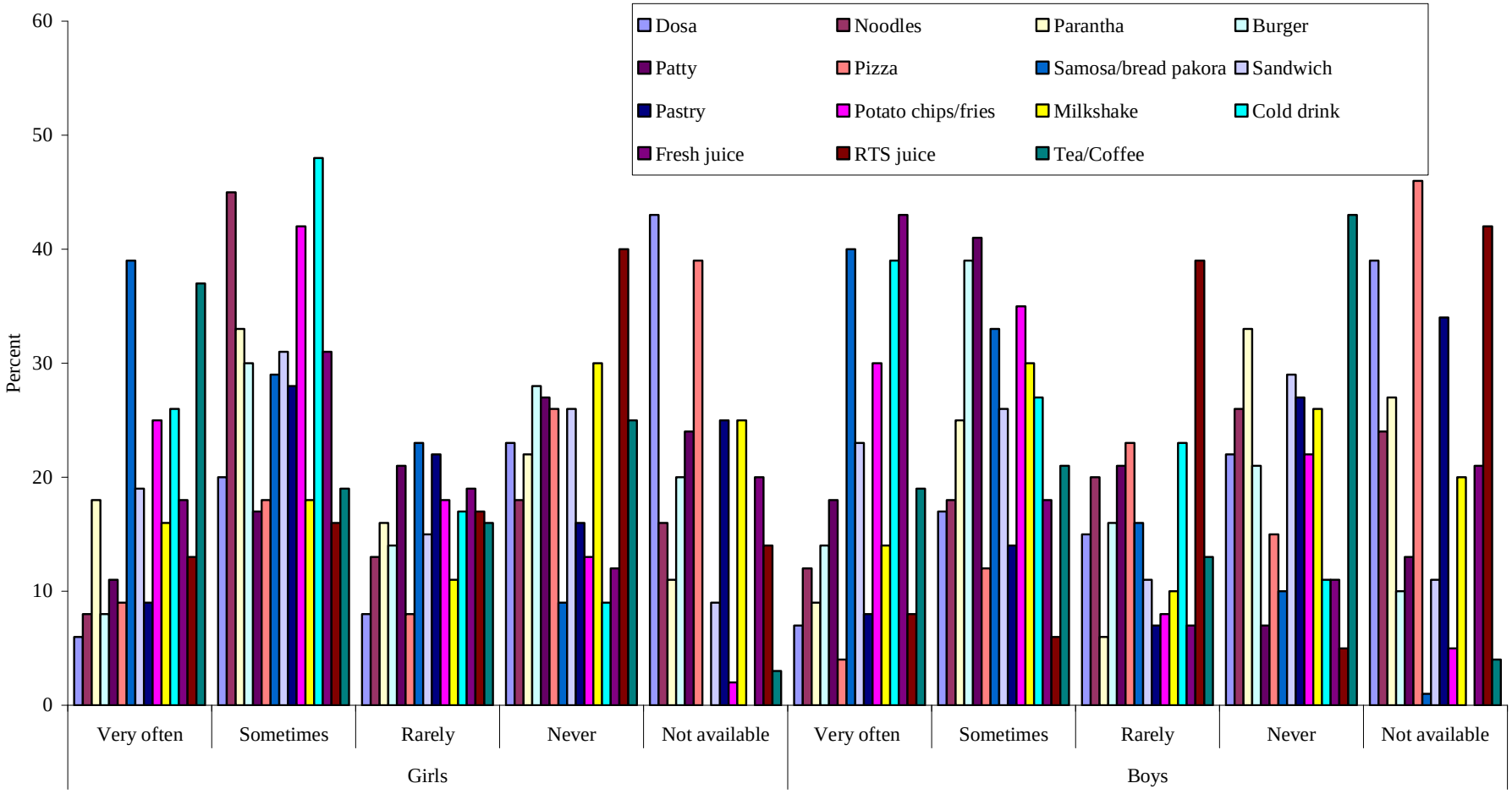

Fig. 4.9 : Sex-wise comparison of foods preferred by students in college canteen

Table 4.14 : College-wise comparison of foods preferred by students in college canteen

Foods	Frequency (n=200)									
	Govt. College (n=100)					Private College (n=100)				
	Very often	Sometimes	Rarely	Never	Not available	Very often	Sometimes	Rarely	Never	Not available
Dosa	5(5)	24(24)	7(7)	27(27)	37(37)	8(8)	13(13)	16(16)	18(18)	45(45)
Noodles	9(9)	27(27)	10(10)	26(26)	28(28)	11(11)	36(36)	23(23)	18(18)	12(12)
Parantha	15(15)	19(19)	11(11)	34(34)	21(21)	12(12)	39(39)	11(11)	21(21)	17(17)
Burger	15(15)	29(29)	13(13)	26(26)	17(17)	7(7)	40(40)	17(17)	23(23)	13(13)
Patty	18(18)	37(37)	15(15)	21(21)	9(9)	11(11)	21(21)	27(27)	13(13)	28(28)
Pizza	7(7)	19(19)	11(11)	33(33)	30(30)	6(6)	11(11)	20(20)	8(8)	55(55)
Samosa/bread pakora	37(37)	29(29)	17(17)	16(16)	1(1)	42(42)	33(33)	22(22)	3(3)	0(0)
Sandwich	20(20)	28(28)	12(12)	31(31)	9(9)	22(22)	29(29)	14(14)	24(24)	11(11)
Pastry	9(9)	31(31)	22(22)	26(26)	12(12)	8(8)	21(21)	7(7)	17(17)	47(47)
Potato chips/fries	21(21)	32(32)	18(18)	23(23)	6(6)	34(34)	45(45)	8(8)	12(12)	1(1)
Milkshake	19(19)	27(27)	8(8)	29(29)	17(17)	11(11)	21(21)	13(13)	27(27)	28(28)
Cold drink	34(34)	29(29)	19(19)	18(18)	0(0)	31(31)	46(46)	21(21)	2(2)	0(0)
Fresh juice	31(31)	21(21)	9(9)	21(21)	18(18)	30(30)	28(28)	17(17)	2(2)	23(23)
RTS juice	12(12)	20(20)	20(20)	33(33)	15(15)	9(9)	2(2)	46(46)	2(2)	41(41)
Tea/Coffee	27(27)	18(18)	18(18)	34(34)	3(3)	29(29)	22(22)	11(11)	34(34)	4(4)

Values in parentheses indicate percentage

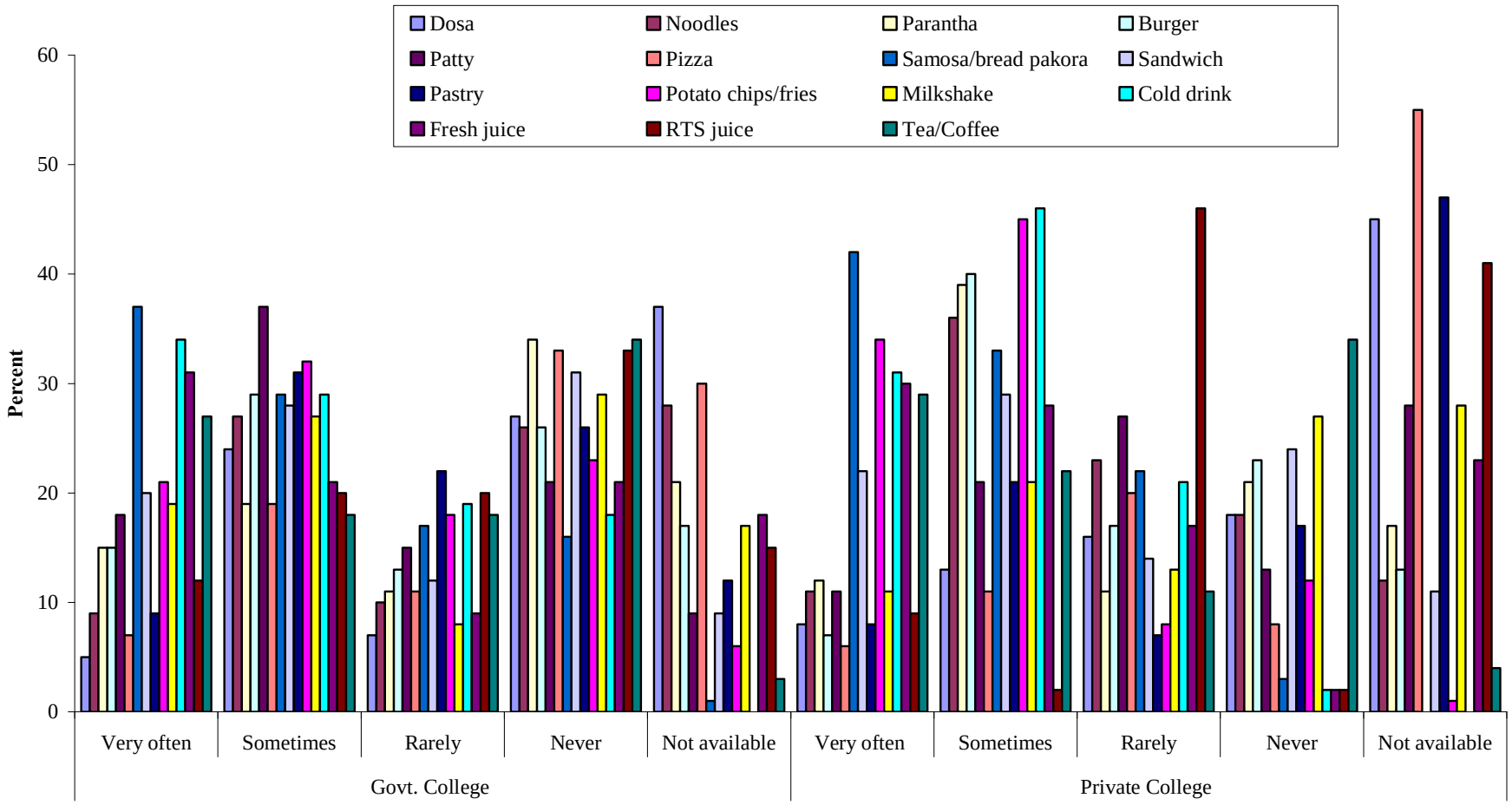

Fig. 4.10 : College-wise comparison of foods preferred by students in college canteen

4.6 Information regarding meal pattern of college going students

Results in Table 4.15-4.18 highlight that a higher percentage of respondents (49.5%) took one meal outside home daily followed by 36 per cent who never took any meal outside; 17.5 per cent took two meals outside the home and only 7 per cent of them took three meals outside home on daily basis. More respondents from government college (45%) as compared to private college (34%) were taking one meal outside while more girls (42%) took one meal outside as compared to boys (37%). The percentage of respondents who skipped meals was 21 per cent; 27.5 per cent skipped meals sometimes while 51.5 per cent never did so. Skipping of meals was more in respondents (29%) from private college than in government college students (13%). On the other hand, more girls (24%) than boys (18%) skipped meals.

Table 4.15 : Information regarding meal pattern of college going students

No. of meals taken outside	**No. of respondents**
One	79(49.5)
Two	35(17.5)
Three	14(7)
Rarely	72(36)
Do you skip meals	
Yes	42(21)
No	103(51.5)
Sometimes	55(27.5)

Values in parentheses indicate percentage

Table 4.16 : Sex-wise comparison of meal pattern of college going students

No. of meals taken outside	**Girls**	**Boys**
One	42(42)	37(37)
Two	15(15)	20(20)
Three	6(6)	8(8)
Rarely	37(37)	35(35)

Values in parentheses indicate percentage

Table 4.17 : College-wise comparison of meal pattern of college going students

No. of meals taken outside	**Govt. College**	**Private College**
One	45(45)	34(34)
Two	17(17)	18(18)
Three	6(6)	8(8)
Rarely	32(32)	40(40)

Values in parentheses indicate percentage

Table 4.18 : College-wise and sex-wise comparison of skipping of meals by college students

Do you skip meals?			
College-wise:	**Yes**	**No**	**Sometimes**
Govt. College	13(13)	55(55)	32(32)
Private College	29(29)	48(48)	23(23)
Sex-wise:			
Girls	24(24)	49(49)	27(27)
Boys	18(18)	54(54)	28(28)

Values in parentheses indicate percentage

4.7 Information regarding meals taken outside home

Table 4.19-4.21 indicated that meals taken outside rarely included fruits/vegetables/ juices (52%) and soft drinks/fast food (43.5%). According to majority of the respondents only 29.5 and 37 per cent respondents mostly included fruits/vegetables/juices and soft drinks/fast food in meals taken outside home by them, respectively. Similar pattern was found when college-wise and sex-wise comparison of meals taken outside home was carried out. More respondents (39%) from private college took soft drinks/fast foods most of the times outside home than fruits/vegetables/juices (23%) while almost equal percentage of respondents from private college mostly included fruits/vegetables/juices (36%) and soft drinks/fast foods (35%) in meals taken outside home by them. Sex-wise comparison depicted that more number of boys (31%) included fruits/vegetables/juices most of the times in meals taken outside as compared to those by girls (29%). In contrast, most of the times more girls (39%) took soft drinks/fast outside home as compared to those by boys (35%).

Table 4.19 : Information regarding meals taken outside home by college going students

Meals taken outside mostly includes:		
a) Fruits/vegetables/juices		
Rarely	**Mostly**	**Always**
104(52)	59(29.5)	37(18.5)
b) Soft drinks/fast food		
Rarely	**Mostly**	**Always**
87(43.5)	74(37)	39(19.5)

Values in parentheses indicate percentage

Table 4.20 : Sex-wise comparison of meals taken outside home by college going students

Meals taken outside mostly includes:					
Girls			**Boys**		
a) Fruits/vegetables/juices					
Rarely	**Mostly**	**Always**	**Rarely**	**Mostly**	**Always**
55(55)	29(29)	16(16)	48(48)	31(31)	21(21)
b) Soft drinks/fast food					
Rarely	**Mostly**	**Always**	**Rarely**	**Mostly**	**Always**
41(41)	39(39)	20(20)	46(46)	35(35)	19(19)

Values in parentheses indicate percentage

Table 4.21 : College-wise comparison of meals taken outside home by college going students

Meals taken outside mostly includes:					
Govt. College			**Private College**		
a) Fruits/vegetables/juices					
Rarely	**Mostly**	**Always**	**Rarely**	**Mostly**	**Always**
56(56)	23(23)	21(21)	48(48)	36(36)	16(16)
b) Soft drinks/fast food					
Rarely	**Mostly**	**Always**	**Rarely**	**Mostly**	**Always**
39(39)	39(39)	22(22)	48(48)	35(35)	17(17)

Values in parentheses indicate percentage

4.8 Food frequency of the college going students

Food that was taken once daily by majority of the respondents included milk (61%). Food items included once daily by 30-50 per cent of the respondents included: curd (44.5%), tea (43.5%), fruits (46%), fruit *chat*/salad (40.5%), breakfast cereals (40.5%), fresh juice (37%), soft drinks (32%), pulses (49.5%) and *chapatti* (42.5%). In government college, students consumed milk (58%), curd (46%), milk and other shakes (28%), breakfast cereals (34%), vegetables (71%), green leafy vegetables (37%), other vegetables (85%), potato vegetable (69%), rice (27%) and pulses (50%) once daily. Similar trend was found in private college. In private college, more respondents were taking fresh juice (46%), soft drinks (39%), fruit salad/*chat* (54%) and chocolates (29%) once on daily basis as compared to 28, 25, 27 and 20 per cent from government college respectively. Sex-wise comparison of food

frequency highlighted that foods which were taken once daily by most of the girls were curd (41%), milk and other shakes (34%), tea (40%), fresh juice (36%), breakfast cereals (43%), fruits (49%), vegetables (80%), other vegetables (78%), potato - as vegetable (70%), rice (30%), pulses (53%) and chocolates (27%) and similar trend was found in boys regarding these foods. Number of girls who consumed milk (68%), fruit salad/*chat* (48%) and green leafy vegetables (39%) once daily were more than boys (milk-54%,fruit salad- 33% and GLVõs-26%). On the other hand, more boys were taking cold drinks (36%) than girls (28%) once daily.

Foods taken in 2-3 times daily category mostly included- *chapatti* (57%) followed by vegetables (22.5%), milk (18.5%), tea (10.5%) and fruits (7.5%) in descending order. While comparing college-wise, it was found that more respondents from private college consumed milk (22%) and *chapatti* (63%) 2-3 times daily as compared to 15 per cent and 51 per cent respondents from government college, respectively. While a higher percentage of government college respondents (29%) consumed vegetables than private college students (16%). Among girls and boys, more boys were consuming milk (29%), curd (17%) and vegetables (29%) 2-3 times daily as compared to 8, 7 and 19 per cent of the girls, respectively. The number of girls (58%) and boys (56%) was similar as their *chapatti* intake 2-3 times daily was concerned.

Percentage of respondents who consumed fast foods once weekly were (21%) chips/fries, (21%) pasta/noodles, (20%) macaroni, (14%) pizza, (23.5%) burger, (29.5%) *samosa,* (25.5%) *bread pakora,* (17.5%) patties, (24%) ice cream, and (14.5%) pastries. Fermented foods like dosa (30%) and idli (18%) were taken once a month by respondents. From both the colleges, more students from private college than government college had pizza (18%), burger (31%) and samosa (35%) once weekly as compared to students from government college (10%; 16% and 23%). On the other hand, government college students preferred *bread pakora* (30%) more than private college students (21%). Sex-wise variation showed that more girls consumed pasta/noodles (24%) and macaroni (23%) once weekly than boys. On the contrary, more boys had pizza (17%) and *samosa* (32%) than girls.

Coffee-hot and cold (30.5%), RTS juice (40.5%), toppings such as jam (42%), cheese (51%), cheese spreads (63.5%), meat and fish products (79%), butter (37%), peanut butter (69.5%), mayonnaise (73.3%) and fruit cream (52%), *dosa* (27.5%), *idli* (39.5%), pasta/noodles (26%), macaroni (41%), porridge (52%), pizza (34%), burger (32.5%), *uttapam* (54%), sandwiches/toast (35.5%), patties (34.5%), fish and fish products (89.5%), meat and poultry (82%), eggs (74%), alcoholic beverages (91%) were the foods that were never consumed by majority of the respondents.

Table 4.22 : Food frequency of the college going students (17-21Y)

Sr. No.	Food product	Once daily	2-3 times daily	Once weekly	2-3 times weekly	Once month	2-3 times month	Rarely	Never
1.	Milk	122(61)	37(18.5)	3(1.5)	2(1)	1(0.5)	0(0)	23(11.5)	12(6)
2.	Yoghurt/curd	89(44.5)	24(12)	23(11.5)	7(3.5)	2(1)	0(0)	14(7)	41(20.5)
3.	Milk and other shakes	66(33)	4(2)	35(17.5)	17(8.5)	7(3.5)	3(1.5)	26(13)	42(21)
4.	Tea	87(43.5)	21(10.5)	4(2)	4(2)	12(6)	1(0.5)	22(11)	49(24.5)
5.	Coffee-hot/cold	37(18.5)	4(2)	25(12.5)	13(6.5)	5(2.5)	16(8)	39(19.5)	61(30.5)
6.	Fresh juice	74(37)	8(4)	44(22)	12(6)	15(7.5)	14(7)	16(8)	17(8.5)
7.	RTS juice	28(14)	6(3)	34(17)	8(4)	13(6.5)	13(6.5)	17(8.5)	81(40.5)
8.	Soft drinks	64(32)	5(2.5)	37(18.5)	14(7)	11(5.5)	6(3)	20(10)	43(21.5)
9.	Breakfast cereals	81(40.5)	7(3.5)	14(7)	5(2.5)	8(4)	7(3.5)	22(11)	56(28)
10.	Toppings/spreads								
a)	Jam	35(17.5)	2(1)	20(10)	13(6.5)	6(3)	10(5)	30(10)	84(42)
b)	Cheese	10(5)	4(2)	32(16)	7(3.5)	20(10)	6(3)	19(9.5)	102(51)
c)	cheese spreads	7(3.5)	1(0.5)	22(11)	9(4.5)	8(4)	0(0)	26(13)	127(63.5)
d)	meat and fish products	3(1.5)	0(0)	14(7)	9(4.5)	7(3.5)	2(1)	7(3.5)	158(79)
e)	Butter	45(22.5)	8(4)	30(15)	10(5)	4(2)	9(4.5)	20(10)	74(37)
f)	peanut butter	5(2.5)	0(0)	16(8)	5(2.5)	6(3)	0(0)	29(14.5)	139(69.5)
g)	Mayonnaise	5(2.5)	0(0)	13(6.5)	0(0)	7(3.5)	1(0.5)	27(13.5)	147(73.5)
11.	Fruits	92(46)	15(7.5)	25(12.5)	28(14)	6(3)	8(4)	22(11)	4(2)
a)	fruit chat/salad	81(40.5)	8(4)	33(16.5)	13(6.5)	8(4)	11(5.5)	16(8)	30(15)
b)	fruit cream	22(11)	1(0.5)	15(7.5)	4(2)	15(7.5)	7(3.5)	32(16)	104(52)
12.	Vegetables	153(76.5)	45(22.5)	0(0)	0(0)	0(0)	0(0)	1(0.5)	1(0.5)
a)	Green leafy	65(32.5)	4(2)	48(24)	37(18.5)	13(6.5)	9(4.5)	6(3)	18(9)
b)	Others	155(77.5)	17(8.5)	11(5.5)	13(6.5)	1(0.5)	0(0)	2(1)	1(0.5)
13.	Potato	128(64)	23(11.5)	6(3)	34(17)	1(0.5)	2(1)	3(1.5)	3(1.5)
a)	as vegetables	132(66)	23(11.5)	8(4)	31(15.5)	1(0.5)	2(1)	1(0.5)	2(1)
b)	as snacks(chips/fries)	54(27)	6(3)	42(21)	14(7)	9(4.5)	6(3)	11(5.5)	58(29)

14.	Rice	57(28.5)	6(3)	77(38.5)	25(12.5)	5(2.5)	12(6)	9(4.5)	9(4.5)
a)	Dosa	4(2)	0(0)	18(9)	11(5.5)	60(30)	8(4)	44(22)	55(27.5)
b)	Idli	6(3)	0(0)	10(5)	6(3)	36(18)	19(9.5)	44(22)	79(39.5)
15.	Pasta/noodles	12(6)	3(1.5)	42(21)	13(6.5)	23(11.5)	17(8.5)	38(19.5)	52(26)
16.	Macaroni	9(4.5)	0(0)	40(20)	21(10.5)	20(10)	11(5.5)	17(8.5)	82(41)
17.	Porridge	5(2.5)	0(0)	25(12.5)	11(5.5)	21(10.5)	8(4)	26(13)	104(52)
18.	Pulses	99(49.5)	11(5.5)	34(17)	31(15.5)	1(0.5)	2(1)	5(2.5)	17(8.5)
19.	Chapatti	85(42.5)	114(57)	0(0)	0(0)	0(0)	0(0)	0(0)	1(0.5)
20.	Pizza	1(0.5)	0(0)	28(14)	7(3.5)	36(18)	14(7)	46(13)	68(34)
21.	Burger	14(7)	0(0)	47(23.5)	14(7)	11(5.5)	15(7.5)	34(17)	65(32.5)
22.	Samosa	43(21.5)	1(0.5)	58(29.5)	26(13)	7(3.5)	8(4)	28(14)	29(14.5)
23.	Uttapam	5(2.5)	0(0)	18(9)	2(1)	3(1.5)	17(8.5)	47(23.5)	108(54)
24.	Bread pakora	20(10)	1(0.5)	51(25.5)	15(7.5)	26(13)	12(6)	21(10.5)	54(27)
25.	Sandwiches/toast	9(4.5)	1(0.5)	37(18.5)	13(6.5)	23(11.5)	5(2.5)	41(20.5)	71(35.5)
26.	Patties	15(7.5)	0(0)	35(17.5)	19(9.5)	11(5.5)	13(6.5)	38(19.5)	69(34.5)
27.	Fish and fish products	2(1)	0(0)	6(3)	0(0)	1(0.5)	1(0.5)	11(5.5)	179(89.5)
28.	Meat and poultry	4(2)	0(0)	9(4.5)	1(0.5)	7(3.5)	4(2)	11(5.5)	164(82)
29.	Eggs	7(3.5)	1(0.5)	15(7.5)	8(4)	7(3.5)	0(0)	14(7)	148(74)
30.	Ice cream	40(20)	0(0)	48(24)	24(12)	14(7)	16(8)	27(13.5)	31(15.5)
31.	Cakes	10(5)	0(0)	32(16)	7(3.5)	52(26)	10(5)	53(26.5)	36(18)
32.	Pastries	11(5.5)	0(0)	29(14.5)	17(8.5)	39(19.5)	18(9)	44(22)	42(21)
33.	Desserts (sweet dish)	22(11)	0(0)	24(12)	28(14)	23(11.5)	20(10)	34(17)	49(24.5)
34.	Chocolate	49(24.5)	2(1)	26(13)	22(11)	16(8)	16(8)	28(14)	41(20.5)
35.	Snacks	46(23)	6(3)	27(13.5)	23(11.5)	5(2.5)	19(9.5)	18(9)	56(28)
36.	Alcoholic beverages	1(0.5)	1(0.5)	0(0)	5(2.5)	2(1)	3(1.5)	6(3)	182(91)

Values in parentheses indicate percentage

Table 4.23 : Sex-wise comparison between food frequencies of the college going students (17-21Y)

Sr. No.	Food product	Girls (n=100)								Boys (n=100)							
		Once daily	2-3 times daily	Once weekly	2-3 times weekly	Once month	2-3 times month	Rarely	Never	Once daily	2-3 times daily	Once weekly	2-3 times weekly	Once month	2-3 times month	Rarely	Never
1.	Milk	68(68)	8(8)	3(3)	1(1)	1(1)	0(0)	13(13)	6(6)	54(54)	29(29)	0(0)	1(1)	0(0)	0(0)	10(10)	6(6)
2.	Yoghurt/curd	41(41)	7(7)	15(15)	3(3)	1(1)	0(0)	8(8)	25(25)	48(48)	17(17)	8(8)	4(4)	1(1)	0(0)	6(6)	16(16)
3.	Milk and other shakes	34(34)	1(1)	19(19)	5(5)	5(5)	1(1)	12(12)	23(23)	32(32)	3(3)	16(16)	12(12)	2(2)	2(2)	14(14)	19(19)
4.	Tea	40(40)	12(12)	2(2)	3(3)	4(4)	0(0)	15(15)	24(24)	47(47)	9(9)	2(2)	1(1)	8(8)	1(1)	7(7)	25(25)
5.	Coffee-hot/cold	20(20)	1(1)	9(9)	5(5)	5(5)	8(8)	23(23)	29(29)	17(17)	3(3)	16(16)	8(8)	0(0)	8(8)	16(16)	32(32)
6.	Fresh juice	36(36)	5(5)	21(21)	8(8)	4(4)	10(10)	9(9)	7(7)	38(38)	3(3)	23(23)	4(4)	11(11)	4(4)	7(7)	10(10)
7.	RTS juice	18(18)	2(2)	11(11)	6(6)	8(8)	5(5)	7(7)	43(43)	10(10)	4(4)	23(23)	2(2)	5(5)	8(8)	10(10)	38(38)
8.	Soft drinks	28(28)	0(0)	18(18)	4(4)	6(6)	4(4)	12(12)	28(28)	36(36)	5(5)	19(19)	10(10)	5(5)	2(2)	8(8)	15(15)
9.	Breakfast cereals	43(43)	4(4)	8(8)	3(3)	3(3)	6(6)	17(17)	16(16)	38(38)	3(3)	6(6)	2(2)	5(5)	1(1)	5(5)	40(40)
10.	Toppings/spreads																
a)	Jam	17(17)	0(0)	11(11)	4(4)	5(5)	7(7)	13(13)	43(43)	18(18)	2(2)	9(9)	9(9)	1(1)	3(3)	17(17)	41(41)
b)	Cheese	6(6)	2(2)	14(14)	2(2)	12(12)	2(2)	7(7)	55(55)	4(4)	2(2)	18(18)	5(5)	8(8)	4(4)	12(12)	47(47)
c)	cheese spreads	4(4)	1(1)	10(10)	5(5)	5(5)	0(0)	7(7)	68(68)	3(3)	0(0)	12(12)	4(4)	3(3)	0(0)	19(19)	59(59)
d)	meat and fish products	2(2)	0(0)	6(6)	3(3)	1(1)	1(1)	4(4)	83(83)	1(1)	0(0)	8(8)	6(6)	6(6)	1(1)	3(3)	75(75)
e)	Butter	16(16)	3(3)	14(14)	4(4)	1(1)	4(4)	10(10)	48(48)	29(29)	5(5)	16(16)	6(6)	3(3)	5(5)	10(10)	26(26)
f)	peanut butter	4(4)	0(0)	6(6)	2(2)	2(2)	0(0)	12(12)	74(74)	1(1)	0(0)	10(10)	3(3)	4(4)	0(0)	17(17)	65(65)
g)	mayonnaise	2(2)	0(0)	5(5)	0(0)	1(1)	1(1)	12(12)	79(79)	3(1)	0(0)	8(8)	0(0)	6(6)	0(0)	15(15)	68(68)
11.	Fruits	49(49)	8(8)	12(12)	10(10)	4(4)	2(2)	12(12)	3(3)	43(43)	7(7)	13(13)	18(18)	2(2)	6(6)	10(10)	1(1)
a)	fruit chat/salad	48(48)	6(6)	16(16)	2(2)	3(3)	3(3)	7(7)	14(14)	33(33)	2(2)	17(17)	11(11)	5(5)	8(8)	8(8)	16(16)
b)	fruit cream	16(16)	0(0)	9(9)	1(1)	5(5)	3(3)	14(14)	52(52)	6(6)	1(1)	6(6)	3(3)	10(10)	4(4)	18(18)	52(52)
12.	Vegetables	80(80)	19(19)	0(0)	0(0)	0(0)	0(0)	1(1)	0(0)	73(73)	26(26)	0(0)	0(0)	0(0)	0(0)	0(0)	1(1)
a)	Green leafy	39(39)	2(2)	22(22)	21(21)	8(8)	2(2)	1(1)	5(5)	26(26)	2(2)	26(26)	16(16)	5(5)	7(7)	5(5)	13(13)
b)	Others	78(78)	10(10)	3(3)	7(7)	0(0)	0(0)	1(1)	1(1)	77(77)	7(7)	8(8)	6(6)	1(1)	0(0)	1(1)	0(0)
13.	Potato	68(68)	10(10)	2(2)	16(16)	0(0)	0(0)	1(1)	3(3)	60(60)	13(13)	4(4)	18(18)	1(1)	2(2)	2(2)	0(0)
a)	as vegetables	70(70)	10(10)	2(2)	17(17)	0(0)	1(1)	0(0)	0(0)	62(62)	13(13)	6(6)	14(14)	1(1)	1(1)	1(1)	2(2)
b)	as snacks(chips/fries)	31(31)	4(4)	27(27)	2(2)	7(7)	0(0)	5(5)	24(24)	23(23)	2(2)	15(15)	12(12)	2(2)	6(6)	6(6)	34(34)

14.	Rice	30(30)	4(4)	40(40)	12(12)	2(2)	7(7)	1(1)	4(4)	27(27)	2(2)	37(37)	13(13)	3(3)	5(5)	8(8)	5(5)
a)	Dosa	3(3)	0(0)	7(7)	8(8)	26(26)	3(3)	26(26)	27(27)	1(1)	0(0)	11(11)	3(3)	34(34)	5(5)	18(18)	28(28)
b)	Idli	4(4)	0(0)	10(10)	2(2)	21(21)	11(11)	23(23)	29(29)	2(2)	0(0)	8(8)	4(4)	15(15)	8(8)	21(21)	42(42)
15.	Pasta/noodles	7(7)	2(2)	24(24)	7(7)	9(9)	11(11)	16(16)	24(24)	5(5)	1(1)	18(18)	6(6)	14(14)	6(6)	22(22)	28(28)
16.	Macaroni	6(6)	0(0)	23(23)	9(9)	11(11)	5(5)	10(10)	36(36)	3(3)	0(0)	17(17)	12(12)	9(9)	6(6)	7(7)	46(46)
17.	Porridge	4(4)	0(0)	10(10)	8(8)	11(11)	3(3)	8(8)	56(56)	1(1)	0(0)	15(15)	3(3)	10(10)	5(5)	18(18)	48(48)
18.	Pulses	53(53)	5(5)	17(17)	15(15)	0(0)	1(1)	3(3)	6(6)	46(46)	6(6)	17(17)	16(16)	1(1)	1(1)	2(2)	11(11)
19.	Chapatti	56(56)	58(58)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	29(29)	56(56)	0(0)	0(0)	0(0)	0(0)	0(0)	1(1)
20.	Pizza	0(0)	0(0)	11(11)	5(5)	22(22)	6(6)	24(24)	32(32)	1(1)	0(0)	17(17)	2(2)	14(14)	8(8)	22(22)	36(36)
21.	Burger	7(7)	0(0)	23(23)	9(9)	8(8)	5(5)	15(15)	33(33)	7(7)	0(0)	24(24)	5(5)	3(3)	10(10)	19(19)	32(32)
22.	Samosa	21(21)	1(1)	26(26)	13(13)	4(4)	8(8)	9(9)	18(18)	22(22)	0(0)	32(32)	13(13)	3(3)	0(0)	19(19)	11(11)
23.	Uttapam	5(5)	0(0)	7(7)	1(1)	1(1)	6(6)	27(27)	53(53)	0(0)	0(0)	11(11)	1(1)	2(2)	11(11)	20(20)	55(55)
24.	Bread pakora	10(10)	1(1)	28(28)	11(11)	11(11)	4(4)	8(8)	27(27)	10(10)	0(0)	23(23)	4(4)	15(15)	8(8)	13(13)	27(27)
25.	Sandwiches/toast	8(8)	0(0)	17(17)	8(8)	9(9)	3(3)	23(23)	32(32)	1(1)	1(1)	20(20)	5(5)	14(14)	2(2)	18(18)	39(39)
26.	Patties	7(7)	0(0)	18(18)	8(8)	7(7)	5(5)	16(16)	39(39)	8(8)	0(0)	17(17)	11(11)	4(4)	8(8)	22(22)	30(30)
27.	Fish and fish products	1(1)	0(0)	1(1)	0(0)	0(0)	0(0)	3(3)	95(95)	1(1)	0(0)	5(5)	0(0)	1(1)	1(1)	8(8)	84(84)
28.	Meat and poultry	2(2)	0(0)	1(1)	0(0)	2(2)	0(0)	4(4)	91(91)	2(2)	0(0)	8(8)	1(1)	5(5)	4(4)	7(7)	73(73)
29.	Eggs	4(4)	0(0)	4(4)	2(2)	3(3)	0(0)	6(6)	81(81)	3(3)	1(1)	11(11)	6(6)	4(4)	0(0)	8(8)	67(67)
30.	Ice cream	18(18)	0(0)	23(23)	16(16)	6(6)	7(7)	14(14)	16(16)	22(22)	0(0)	25(25)	8(8)	8(8)	9(9)	13(13)	15(15)
31.	Cakes	6(6)	0(0)	15(15)	4(4)	35(35)	4(4)	25(25)	11(11)	4(4)	0(0)	17(17)	3(3)	17(17)	6(6)	28(28)	25(25)
32.	Pastries	6(6)	0(0)	16(16)	5(5)	23(23)	7(7)	20(20)	23(23)	5(5)	0(0)	13(13)	12(12)	16(16)	11(11)	24(24)	19(19)
33.	Desserts (sweet dish)	15(15)	0(0)	10(10)	18(18)	11(11)	5(5)	14(14)	27(27)	7(7)	0(0)	14(14)	10(10)	12(12)	15(15)	20(20)	22(22)
34.	Chocolate	27(27)	2(2)	13(13)	7(7)	7(7)	12(12)	13(13)	19(19)	22(22)	0(0)	13(13)	15(15)	9(9)	4(4)	15(15)	22(22)
35.	Snacks	25(25)	2(2)	17(17)	10(10)	2(2)	15(15)	5(5)	24(24)	21(21)	4(4)	10(10)	13(13)	3(3)	4(4)	13(13)	32(32)
36.	Alcoholic beverages	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	2(2)	98(98)	1(1)	1(1)	0(0)	5(5)	2(2)	3(3)	4(4)	84(84)

Values in parentheses indicate percentage

Table 4.24 : College-wise comparison between food frequencies of the college going students (17-21Y)

Sr. No.	Food product	Govt. College								Private College							
		Once daily	2-3 times daily	Once weekly	2-3 times weekly	Once month	2-3 times month	Rarely	Never	Once daily	2-3 times daily	Once weekly	2-3 times weekly	Once month	2-3 times month	Rarely	Never
1.	Milk	58(58)	15(15)	2(2)	2(2)	1(1)	0(0)	14(14)	8(8)	64(64)	22(22)	1(1)	0(0)	0(0)	0(0)	9(9)	4(4)
2.	Yoghurt/curd	46(46)	13(13)	10(10)	2(2)	1(1)	0(0)	5(5)	23(23)	43(43)	11(11)	13(13)	5(5)	1(1)	0(0)	9(9)	18(18)
3.	Milk and other shakes	28(28)	0(0)	21(21)	9(9)	6(6)	2(2)	6(6)	28(28)	38(38)	4(4)	14(14)	8(8)	1(1)	1(1)	20(20)	14(14)
4.	Tea	41(41)	13(13)	3(3)	3(3)	8(8)	0(0)	11(11)	21(21)	46(46)	8(8)	1(1)	1(1)	4(4)	1(1)	11(11)	28(28)
5.	Coffee-hot/cold	25(25)	2(2)	12(12)	5(5)	3(3)	6(6)	12(12)	35(35)	12(12)	2(2)	13(13)	8(8)	2(2)	10(10)	27(27)	26(26)
6.	Fresh juice	28(28)	5(5)	21(21)	8(8)	5(5)	8(8)	15(15)	10(10)	46(46)	3(3)	23(23)	4(4)	10(10)	6(6)	1(1)	7(7)
7.	RTS juice	10(10)	1(1)	10(10)	7(7)	6(6)	10(10)	2(2)	54(54)	18(18)	5(5)	24(24)	1(1)	7(7)	3(3)	15(15)	27(27)
8.	Soft drinks	25(25)	3(3)	15(15)	5(5)	6(6)	2(2)	12(12)	32(32)	39(39)	2(2)	22(22)	9(9)	5(5)	4(4)	8(8)	11(11)
9.	Breakfast cereals	34(34)	2(2)	9(9)	2(2)	2(2)	6(6)	4(4)	41(41)	47(47)	5(5)	5(5)	3(3)	6(6)	1(1)	18(18)	15(15)
10.	Toppings/spreads																
a)	Jam	13(13)	0(0)	5(5)	11(11)	4(4)	4(4)	16(16)	47(47)	22(22)	2(2)	15(15)	2(2)	2(2)	6(6)	14(14)	37(37)
b)	Cheese	3(3)	1(1)	15(15)	1(1)	7(7)	1(1)	10(10)	62(62)	7(7)	3(3)	17(17)	6(6)	13(13)	5(5)	9(9)	40(40)
c)	cheese spreads	2(2)	0(0)	10(10)	2(2)	4(4)	0(0)	11(11)	71(71)	5(5)	1(1)	12(12)	7(7)	4(4)	0(0)	15(15)	56(56)
d)	meat and fish products	2(2)	0(0)	6(6)	3(3)	2(2)	1(1)	0(0)	86(86)	1(1)	0(0)	8(8)	6(6)	5(5)	1(1)	7(7)	72(72)
e)	Butter	17(17)	3(3)	16(16)	4(4)	1(1)	3(3)	12(12)	44(44)	28(28)	5(5)	14(14)	6(6)	3(3)	6(6)	8(8)	30(30)
f)	peanut butter	2(2)	0(0)	5(5)	2(2)	3(3)	0(0)	17(17)	71(71)	3(3)	0(0)	11(11)	3(3)	3(3)	0(0)	12(12)	68(68)
g)	mayonnaise	2(2)	0(0)	4(4)	0(0)	1(1)	0(0)	14(14)	79(79)	3(3)	0(0)	9(9)	0(0)	6(6)	1(1)	13(13)	68(68)
11.	Fruits	40(40)	5(5)	19(19)	12(12)	6(6)	0(0)	15(15)	3(3)	52(52)	10(10)	6(6)	16(16)	0(0)	8(8)	7(7)	1(1)
a)	fruit chat/salad	27(27)	2(2)	20(20)	4(4)	4(4)	5(5)	14(14)	24(24)	54(54)	6(6)	13(13)	9(9)	4(4)	6(6)	2(2)	6(6)
b)	fruit cream	13(13)	0(0)	7(7)	0(0)	2(2)	1(1)	21(21)	56(56)	9(9)	1(1)	8(8)	4(4)	13(13)	6(6)	11(11)	48(48)
12.	Vegetables	71(71)	29(29)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	82(82)	16(16)	0(0)	0(0)	0(0)	0(0)	1(0)	1(0)
a)	Green leafy	37(37)	2(2)	22(22)	16(16)	4(4)	5(5)	2(2)	12(12)	28(28)	2(2)	26(26)	21(21)	9(9)	4(4)	4(4)	6(6)
b)	Others	85(85)	7(7)	3(3)	3(3)	0(0)	0(0)	1(1)	1(1)	70(70)	10(10)	8(8)	10(10)	1(1)	0(0)	1(1)	0(0)
13.	Potato	67(67)	10(10)	2(2)	16(16)	0(0)	1(1)	3(3)	1(1)	61(61)	13(13)	4(4)	18(18)	1(1)	1(1)	0(0)	2(2)
a)	as vegetables	69(69)	10(10)	2(2)	15(15)	0(0)	2(2)	0(0)	2(2)	63(63)	13(13)	6(6)	16(16)	1(1)	0(0)	1(1)	0(0)
b)	as snacks(chips/fries)	22(22)	3(3)	19(19)	5(5)	4(4)	1(1)	2(2)	44(44)	32(32)	3(3)	23(23)	9(9)	5(5)	5(5)	9(9)	14(14)

14.	Rice	27(27)	2(2)	39(39)	13(13)	2(2)	9(9)	2(2)	6(6)	30(30)	4(4)	38(38)	12(12)	3(3)	3(3)	7(7)	3(3)
a)	Dosa	1(1)	0(0)	8(8)	3(3)	29(29)	5(5)	20(20)	34(34)	3(3)	0(0)	10(10)	8(8)	31(31)	3(3)	24(24)	21(21)
b)	Idli	2(2)	0(0)	4(4)	2(2)	23(23)	3(3)	23(23)	43(43)	4(4)	0(0)	6(6)	4(4)	13(13)	16(16)	21(21)	36(36)
15.	Pasta/noodles	4(4)	1(1)	20(20)	5(5)	17(17)	2(2)	17(17)	34(34)	8(8)	2(2)	22(22)	8(8)	6(6)	15(15)	21(21)	18(18)
16.	Macaroni	3(3)	0(0)	18(18)	9(9)	14(14)	2(2)	7(7)	47(47)	6(6)	0(0)	22(22)	12(12)	6(6)	9(9)	10(10)	35(25)
17.	Porridge	4(4)	0(0)	17(17)	0(0)	12(12)	6(6)	12(12)	49(49)	1(1)	0(0)	8(8)	11(11)	9(9)	2(2)	14(14)	55(55)
18.	Pulses	50(50)	4(4)	17(17)	15(15)	0(0)	2(2)	2(2)	10(10)	49(49)	7(7)	17(17)	16(16)	1(1)	0(0)	3(3)	7(7)
19.	Chapatti	49(49)	51(51)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	36(36)	63(63)	0(0)	0(0)	0(0)	0(0)	0(0)	1(1)
20.	Pizza	0(0)	0(0)	10(10)	3(3)	13(13)	4(4)	20(20)	50(50)	1(1)	0(0)	18(18)	4(4)	23(23)	10(10)	26(26)	18(18)
21.	Burger	9(9)	0(0)	16(16)	6(6)	5(5)	2(2)	14(14)	48(48)	5(5)	0(0)	31(31)	8(8)	6(6)	3(3)	20(20)	27(27)
22.	Samosa	30(30)	1(1)	23(23)	12(12)	2(2)	2(2)	16(16)	14(14)	13(13)	0(0)	35(35)	14(14)	5(5)	6(6)	12(12)	15(15)
23.	Uttapam	5(5)	0(0)	7(7)	0(0)	0(0)	5(5)	18(18)	65(65)	0(0)	0(0)	11(11)	2(2)	3(3)	12(12)	29(29)	43(43)
24.	Bread pakora	7(7)	1(1)	30(30)	2(2)	17(17)	10(10)	8(8)	25(25)	13(13)	0(0)	21(21)	13(13)	9(9)	2(2)	13(13)	29(29)
25.	Sandwiches/toast	6(6)	0(0)	17(17)	4(4)	17(17)	1(1)	12(12)	43(43)	3(3)	1(1)	20(20)	9(9)	6(6)	4(4)	29(29)	28(28)
26.	Patties	8(8)	0(0)	19(19)	1(1)	2(2)	10(10)	16(16)	44(44)	7(7)	0(0)	16(16)	18(18)	9(9)	3(3)	22(22)	25(25)
27.	Fish and fish products	2(2)	0(0)	1(1)	0(0)	0(0)	0(0)	5(5)	92(92)	0(0)	0(0)	5(5)	0(0)	1(1)	1(1)	6(6)	87(87)
28.	Meat and poultry	1(1)	0(0)	3(3)	1(1)	2(2)	2(2)	3(3)	88(88)	3(3)	0(0)	6(6)	0(0)	5(5)	2(2)	8(8)	76(76)
29.	Eggs	3(3)	1(1)	4(4)	3(3)	2(2)	0(0)	8(8)	79(79)	4(4)	0(0)	11(11)	5(5)	5(5)	0(0)	6(6)	69(69)
30.	Ice cream	15(15)	0(0)	24(24)	9(9)	6(6)	3(3)	17(17)	26(26)	25(25)	0(0)	24(24)	15(15)	8(8)	13(13)	10(10)	5(5)
31.	Cakes	4(4)	0(0)	12(12)	2(2)	14(14)	3(3)	34(34)	31(31)	6(6)	0(0)	20(20)	5(5)	38(38)	7(7)	19(19)	5(5)
32.	Pastries	7(7)	0(0)	13(13)	6(6)	13(13)	6(6)	17(17)	38(38)	4(4)	0(0)	16(16)	11(11)	26(26)	12(12)	27(27)	4(4)
33.	Desserts (sweet dish)	7(7)	0(0)	12(12)	15(15)	7(7)	12(12)	7(7)	40(40)	15(15)	0(0)	12(12)	13(13)	16(16)	8(8)	27(27)	9(9)
34.	Chocolate	20(20)	1(1)	17(17)	8(8)	6(6)	9(9)	10(10)	29(29)	29(29)	1(1)	9(9)	14(14)	10(10)	7(7)	18(18)	12(12)
35.	Snacks	19(19)	2(2)	15(15)	7(7)	1(1)	13(13)	6(6)	37(37)	27(27)	4(4)	12(12)	16(16)	4(4)	6(6)	12(12)	19(19)
36.	Alcoholic beverages	1(1)	0(0)	0(0)	2(2)	1(1)	2(2)	4(4)	90(90)	0(0)	1(1)	0(0)	3(3)	1(1)	1(1)	2(2)	92(92)

Values in parentheses indicate percentage

4.9 Food intake by college going students

The information regarding daily mean food intake of college going students (17-21 years) has been depicted in Tables 4.25-4.27 (Fig. 4.11-4.13). The intake of different food groups has been given as under:

4.9.1 Cereals

Cereals are the part and parcel of Indian diet and provide energy and several other nutrients at a very low cost. These are the cheapest and widely available sources of nutrients, particularly in developing countries like India. Mean daily cerealsô intake of the girls and boys (17-18Y) were 436g and 690.3g which were 132.1 and 153.4 per cent of RDI (Table 4.25) and significantly ($p<0.05$) higher than the RDI.

On perusal of data (Table 4.26) it was found that the intake of cereals of both boys and girls of 18-21 years was higher than their respective RDIs; significant ($p<0.05$) difference was in case of girls but not so among boys. Mean daily cerealsô intake of the girls (18-21Y) was 336.2g which was 124.5 per cent of RDI and significantly higher ($p<0.05$) than the RDI and mean daily cerealsô intake of the boys (18-21Y) was 416.5g which was 111.6 per cent of RDI (Table 4.26) but the difference was non- significant.

Table 4.27 depicts the difference in the mean intake of cereals of respondents of government and private colleges (17-21Y). Daily mean intake of cereals of government college students was 519.2g/day which was significantly ($p<0.05$) higher than their private college counter parts (346.4g/day).

4.9.2 Pulses

Pulses are the major source of protein in Indian diets. The data presented in Table 4.25 indicates that daily mean intake of pulses among college going girls (17-18 Y) was 61.2g which was 81.6 per cent of RDI. Among boys of the same age group, daily mean intake of pulses was 140.2g which was 155.7 per cent of RDI and was significantly ($p<0.05$) higher.

The daily mean intake of pulses of girls and boys of 18-21 years of age was 66.2g and 80.9gwhich was 110.3 and 107 per cent of RDI, respectively.

College-wise comparison indicated that mean intake of pulses of respondents of government and private college students were 88.8g/day and 72.1g/day, respectively but this difference was non-significant (Table 4.27).

4.9.3 Roots and tubers

The data in Table 4.25 revealed that the daily mean intake of root and tubers of college going girls (17-18Y) was significantly ($p<0.05$) lower than the RDI; it was 62.9 per cent of the RDI. On the other hand, boys were consuming more amounts of roots and tubers than the RDI; their mean daily intake was 108.7 per cent of the RDI (Table 4.26).

The daily mean intake of root and tubers of college going girls of 18-21 years was 99.8g which was almost half of the RDI and it was significantly ($p<0.05$) lower than RDI; in

boys of the same age group, mean daily intake was 139.4g which was 69.7 per cent of the RDI (Fig.4.) which was significantly ($p<0.05$) lower.

When mean daily intake of roots and tubers of government and private college students was compared, it was found that students from government college were consuming higher amounts (167.6g) than those from private college students (102.8g) and the difference was significant ($p<0.05$) (Table 2.27).

4.9.4 Other vegetables

This group belongs to those vegetables which are not covered under green leafy vegetables and roots and tubers. Table 4.25 shows the mean intake of other vegetables of college going students (17-18Y). Among girls it was 55.6g/day (27.8% of RDI) which was significantly ($p<0.05$) lower than the RDI. In boys, the mean daily intake of other vegetables was (35.8% of RDI) significantly ($p<0.05$) lower than the RDI.

Table 4.26 showed the mean intake of other vegetables of college going girls and boys in the age group of 18-21 years and among girls it only 34.9per cent of the RDI which was significant ($p<0.05$). The mean intake of other vegetables of boys was 61.2g which was 30.6 per cent of the RDI and was again significantly ($p<0.05$) less than the RDI.

The data in Table 2.27 showed that no significant differences existed in the mean daily intake of other vegetables among government and private college students.

4.9.5 Green leafy vegetables

Green leafy vegetables are rich source of calcium, iron, ß-carotene, vitamin C and folic acid. Table 4.25 reveals that mean daily intake of green leafy vegetables of the girls and boys of 17-18 years was 53.6 per cent and 72.2 per cent of RDI, respectively and the difference were significant (Table 4.25).

Similarly, Table 4.26 highlighted that intake of green leafy vegetables of the college going boys and girls (18-21Y). Girlsô intake was only 17.3g/day (17.3% of RDI) which was significantly ($p<0.05$) lower than the RDI. Similar trend was noticed in the mean daily intake of GLVs of boys (29% of RDI) which was significantly ($p<0.05$) lower than the RDI.

College-wise comparative results (Table 4.27) indicate that there was a significant ($p<0.05$) difference in mean intake of green leafy vegetables among government and private college students. Intake of green leafy vegetables by government college students was higher (47.1g/day) than those from private college (23.3g/day).

4.9.6 Milk and milk products

Milk is not only a good source of protein, but also provides calcium and riboflavin. Data in Table 4.25 illustrates the mean daily intake of milk and milk products of college going students (17-18Y); it was 529.1g/day among girls (105.8% of RDI) while in boys it was 693.2g/day (138.6%RDI). In both cases, intakes were significantly ($p<0.05$) higher than the respective RDIs.

Table 4.25 : Sex-wise comparison of daily mean food intake by college going students (17-18Y)

Foodstuff (g)	Recommended Dietary Intake (RDI)	Actual Intake		Recommended Dietary Intake (RDI)	Actual Intake	
		Girls (n=11)	't' value		Boys (n=8)	't' value
Cereals	330.0	436±4.50 (132.1)	23.57*	450.0	690.3±85.31 (153.4)	2.81*
Pulses	75.0	61.2±9.20 (81.6)	1.49	90.0	140.2±7.0 (155.7)	7.16*
Roots and tubers	200.0	125.9±1.7 (62.9)	43.28*	200.0	217.5±28.26 (108.7)	0.61
Other Vegetables	200.0	55.6±2.78 (27.8)	51.93*	200.0	71.7±1.36 (35.8)	94.34*
Green leafy vegetables	100.0	53.6±12.80 (53.6)	3.62*	100.0	72.2±7.82 (72.2)	3.55*
Milk and milk products	500.0	529.1±11.32 (105.8)	2.56*	500.0	693.2±17.88 (138.6)	10.80*
Fats & oils	35.0	37.8±0.58 (108.2)	9.79*	50.0	58.5±10.16 (117.0)	1.72
Sugar & jaggery	25.0	17.8±0.10 (71.2)	72.20*	30.0	24.6±0.51 (82.0)	10.66*
Fruits	100.0	150.4±7.66 (150.4)	6.57*	100.0	227.4±38.33 (227.4)	3.32*

Values are mean ±SD
* Significant at 5% level
Values in parentheses indicate percentage (%RDI)
ά ô values showing comparison of daily mean nutrient intake and RDA

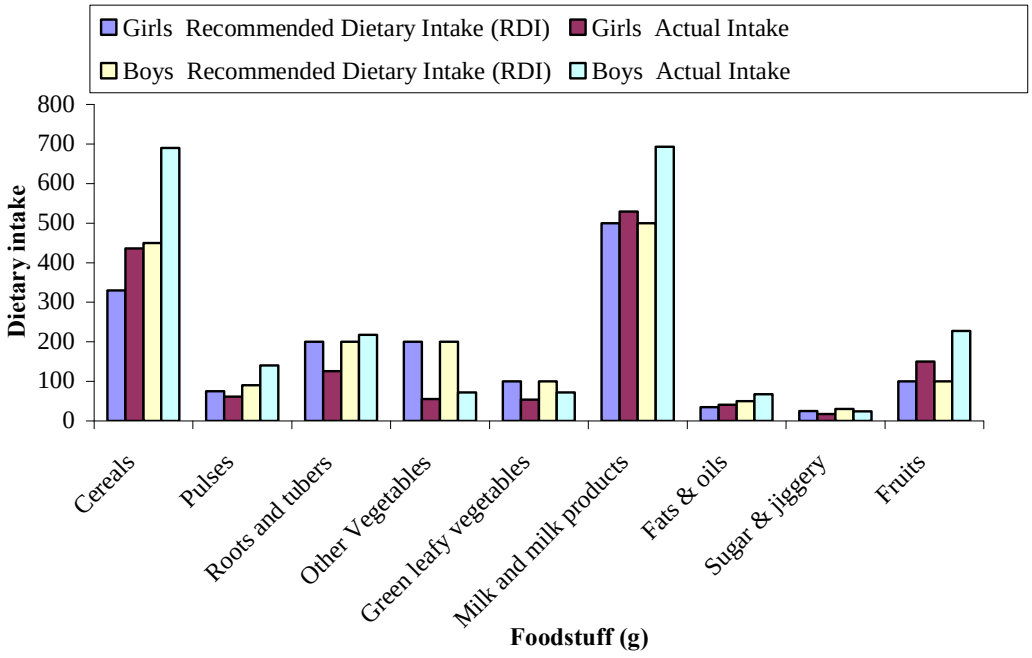

Fig. 4.11 : Sex-wise comparison of daily mean food intake by college going students (17-18Y)

Table 4.26 : Sex-wise comparison of daily mean food intake by college going student (18-21Y)

Foodstuff (g)	Recommended Dietary Intake (RDI)	Actual Intake		Recommended Dietary Intake (RDI)	Actual Intake	
		Girls (n=19)	't' Value		Boys (n=22)	't' Value
Cereals	270.0	336.2±12.34 (124.5)	5.36*	375.0	416.5±33.0 (111.06)	1.25
Pulses	60.0	66.2±3.75 (110.3)	1.66	75.0	80.9±5.87 (107.8)	0.09
Roots and tubers	200.0	99.8±5.22 (49.9)	19.17*	200.0	139.4±11.99 (69.7)	5.05*
Other Vegetables	200.0	69.6±1.53 (34.9)	85.24*	200.0	61.2±0.69 (30.6)	201.17*
Green leafy vegetables	100.0	17.3±0.28 (17.3)	295.39*	100.0	29.0±2.54 (29.0)	27.9*
Milk and milk products	300.0	446.4±0.27 (148.8)	542.14*	300.0	599.7±3.79 (199.9)	79.08*
Fats & oils	20.0	22.1±0.09 (110.5)	9.4*	25.0	30.2±3.16 (121)	3.16*
Sugar & jaggery	20.0	18.7±0.01 (93.5)	132.0*	20.0	20.4±0.60 (102.0)	0.63
Fruits	100.0	98.6±5.94 (98.6)	0.23*	100.0	122.7±2.13 (122.7)	10.67*

Values are mean ±SD
* Significant at 5% level
Values in parentheses indicate percentage (%RDI)
áôvalues showing comparison of daily mean nutrient intake and RDA

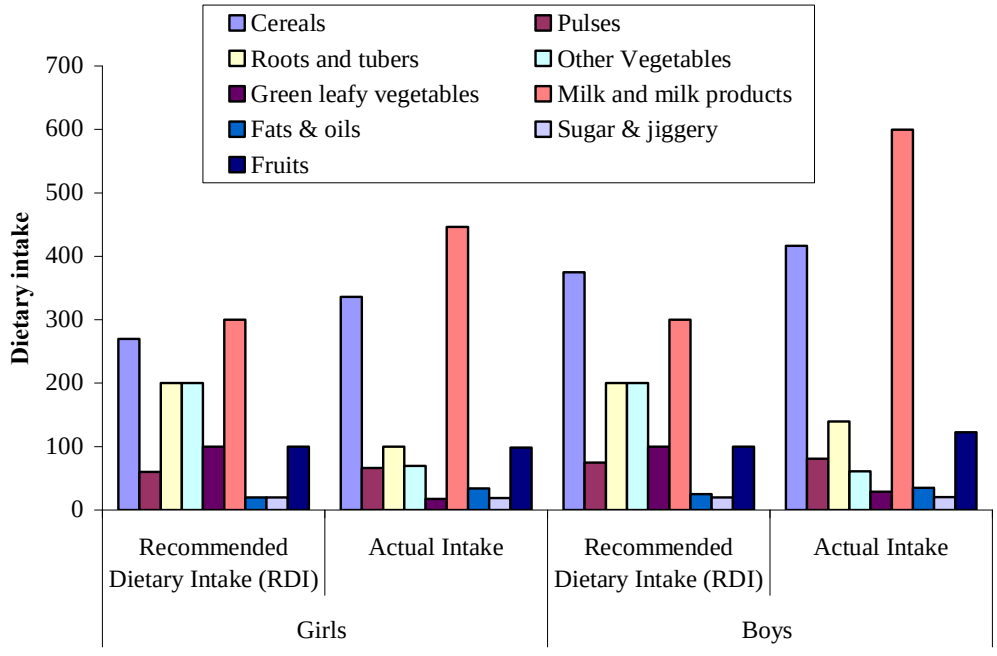

Fig. 4.12 : Sex-wise comparison of daily mean food intake by college going students (18-21Y)

Table 4.27 : College-wise comparison of daily mean food intake of college going students (17-21Y)

Food Stuff	Govt. College (n=30)	Private College (n=30)	't' Value
Cereals	519.2±187.32	346.4±82.78	4.62*
Pulses	88.8±37.44	72.1±29.85	1.91
Roots and Tubers	167.6±62.70	102.8±26.84	5.20*
Other vegetables	64.6±11.02	63.3±4.37	0.61
Green leafy vegetables	47.1±27.79	23.3±23.37	3.43*
Milk and milk products	550.1±79.81	553.9±97.07	0.16
Fats & oils	43.8±23.23	36.4±6.54	1.67
Sugar & jiggery	20.9±2.96	18.8±2.01	3.28*
Fruits	130.8±3.29	139.1±82.99	0.55

Values are mean ±SD
* Significant at 5% level
άôvalue showing comparison among govt. college and private college students

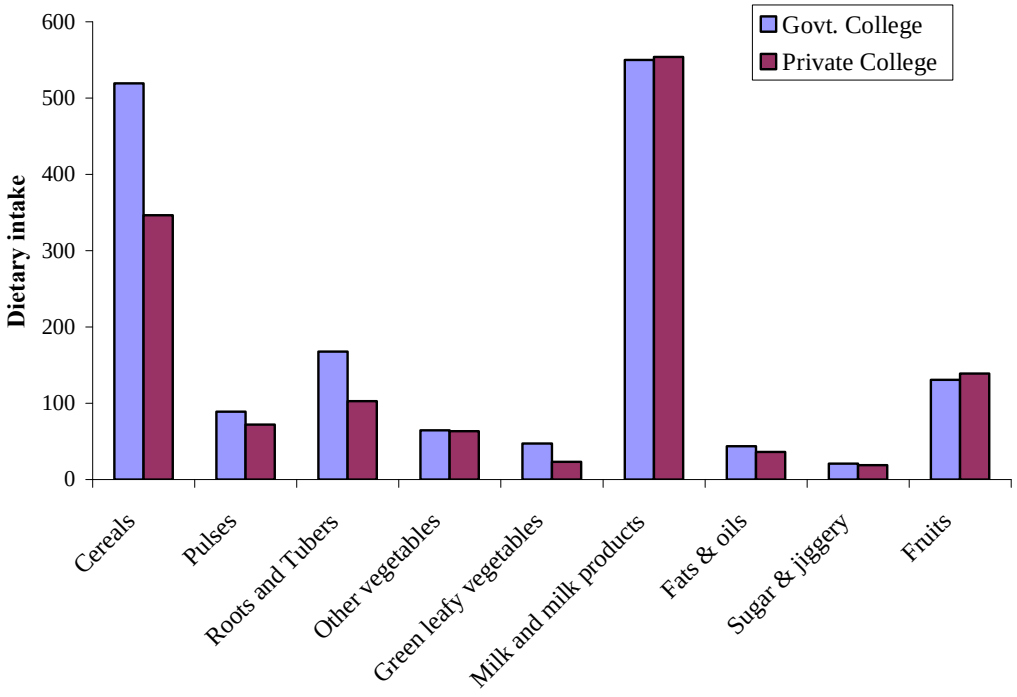

Fig. 4.13 : College-wise comparison of daily mean food intake of college going students (17-21Y)

In Table 4.26, the mean daily intake of milk and milk products of college going students (18-21Y) has been highlighted. Mean daily intake of milk and milk products among girls was 446.4g/day (148.8% of the RDI) which was significantly higher than the RDI and for boys, intake was almost double of the RDI and which was significant ($p<0.05$).

The difference between the daily mean intake of milk and milk products among government and private college students was non-significant ($t=0.16$) (Table 2.27).

4.9.7 Fats and oils

Data compiled in Table 4.25 contains the results related to the daily mean visible fat and oils intake of college going students (17-18Y) which was 37.8 g (108.2 % of RDI) in girls and 58.5g (117% of RDI) in boys, respectively. Girls were taking significantly ($p<0.05$) higher amount of fats and oils daily.

Table 2.26 showed the mean daily intake of visible fats and oils among college going students (18-21Y) and in girls and boys, it was 22.1g/day (110.5% of RDI) and 30.2g/day (121% of RDI), respectively.

The college-wise analysis (Table 4.27) brought out non significant ($p<0.05$) difference in mean daily intake of visible fats and oils among government and private college students.

4.9.8 Sugar and jaggery

Sugar and jaggery are sweetening agents and consumed by almost all the people in varying amounts. They are added to beverages and other foods to increase their palatability. Mean intake of sugar and jaggery has been presented in Table 4.25 for college going students in the age group of 17-18 year. The consumption of sugar and jaggery among girls was 17.8g/day which was significantly ($p<0.05$) lower than the RDI and that of boys was also less than RDI i.e. 24.6g/day (82% of RDI).

Table 4.26 highlighted the mean intake of sugar and jaggery of both boys and girls (18-21Y) in daily diet. For girls, daily mean intake of sugars and jiggery was 18.7g (93.5% of the RDI) which was significantly ($p<0.05$) higher than RDI. Among boys, intake was 20.4g (102% of RDI) which almost similar to RDI.

The college-wise difference with regard to the intake of sugar and jaggery was found to be significant ($p<0.05$); daily mean intake of sugars and jaggery among respondents of government and private colleges was 20.9g and 18.8g, respectively (Table 4.27).

4.9.9 Fruits

Fruits are good sources of vitamins and minerals and also contain fibre, which provides bulk to the diet. The mean daily intake of fruits in girls (17-18Y) was 150.4g which was significantly ($p<0.05$) higher than the RDI (150.4% of the RDI) while among boys of the same age group intake was 227.4g/day (227.4% of RDI) which was significantly ($p<0.05$) higher than the RDI (Table 4.25).

Data in Table 2.26 represents the mean daily intake of fruits of college going students of 18-21 year. In girls, the daily mean intake of fruits was 98.6g which was 98.6 per cent of the RDI; in boys, it was 122.7g/ day and was significantly ($p<0.05$) higher than the RDI.

Table 2.27 depicted the difference in the mean daily intake of fruits among the students of government and private college which was found to be non-significant.

4.10 Adequacy of food intake by college going students

The results regarding adequacy of food intake have been shown in Tables 4.28 and 4.29. The different food stuffs have been discussed individually as given below:

4.10.1 Cereals

Data in Table 4.28 illustrated the difference regarding adequacy of cereals intake on the basis of sex (17-18Y). It has been concluded from the data that majority of boys (37.5%) and girls (50%) consumed adequate amount of cereals followed by marginal adequate cereal intake by 37.5 and 33.3 per cent of boys and girls, respectively.

In Table 4.29 the adequacy of cerealsô intake of boys and girls (18-21Y) has been showed. Majority of boys (72.7%) took marginally adequate amounts of cereals followed by equal percentage (13.6%) who consumed adequate and marginally inadequate amounts. On the other hand, most of the girls (44.4%) took marginally inadequate while 33.3 per cent had marginally adequate amount and equal percentages (11.1) of girls consumed adequate and inadequate amounts of cereals.

4.10.2 Pulses

Data (Table 4.28) related to adequacy of pulses determined that majority (50%) of college going boys (17-18Y) consumed pulses between 75 to 99.9 per cent of RDI. Remaining of the boys consumed marginally inadequate (25%) and adequate amount of pulses (25%). Majority (66.6%) of girls (17-18Y) consumed marginally inadequate amount of pulses while the remaining (33.3%) had inadequate amount of pulses.

For girls and boys in the age group of 18-21 years, data given in Table 4.29 revealed that a higher percentage of boys (54.5%) were taking adequate amount of pulses followed by 27.3 and 18.2 per cent who took marginally adequate and marginally inadequate amount, respectively. In comparison to boys, most of the girls (50%) consumed marginally adequate amount of pulses; 33.3 and 16.6 per cent took marginally inadequate and inadequate amounts of pulses, respectively.

4.10.3 Roots and tubers

As far as intake of roots and tubers is concerned, majority of the boys (62.5%) had marginally adequate amount daily. Marginally inadequacy for roots and tubers was observed

in 37.5 per cent of boys (Table 4.28). Intake of roots and tubers was marginally inadequate and inadequate among equal percentage of girls i.e. 50 per cent (17-18Y).

From the data given in Table 4.29 it has been further inferred about boys and girls (18-21Y) that majority of boys (50%) consumed below 50 per cent of RDI and girls (61.1%) took marginally adequate amounts of roots and tubers. Rest of the boys took marginally adequate (45.4%) and adequate (4.5%) amounts while remaining girls (38.8%) had marginally inadequate amount of pulses.

4.10.4 Green leafy vegetables

For adequacy of green leafy vegetables, Table 4.28 illustrated that equal percentage of boys in the age group of 17-18 years (50%) were in adequate and marginally inadequate category. While majority of the girls consumed green leafy vegetables between 50 to 74.9 per cent of RDI while the remaining (41.5) had adequate amount daily.

Sex-wise (18-21Y) comparative analysis showed marginally inadequate and inadequate amount of green leafy vegetables consumption by half (54.5%; 45.4%) of boys and inadequate amount by 100 per cent girls (Table 4.29).

4.10.5 Other vegetables

It is clear from Table 4.28 that 75 per cent of boys were taking marginally inadequate amount of other vegetables, while 25 per cent boys took inadequate, amount. On the other hand, 100 per cent of the girls (17-18Y) consumed other vegetables less than 50 per cent of the RDI.

When comparing adequacy of other vegetables of boys and girls (18-21Y), it was found that most of the boys (81.8%) as compared to 100 per cent girls were taking inadequate amount of other vegetables (Table 4.29).

4.10.6 Fruits

Results in Table 4.28 concluded that equal percentage i.e. 37.5 per cent of the boys (17-18Y) took fruits adequately and marginally inadequate. On the contrary, majority of the girls (50%) took marginally inadequate amount of fruits followed by 33.3 and 16.6 per cent who consumed fruits adequately and marginally adequately, respectively.

It is evident from the Table 4.29 that majority of boys (45.4%) and girls (61.1%) consumed fruits between 75 to 99.9 per cent of RDI. Second highest majority (31.8 and 38.8%) of boys and girls consumed marginally inadequate and only 2 per cent boys took adequate amount of fruits daily while 13.6 per cent boys took inadequate amounts.

4.10.7 Milk and milk products

The intake of milk and milk products was inadequate only among 12.5 per cent of the boys (17-18Y). Majority of the boys consumed marginally adequate (50%) and rest consumed

adequate (37.5%) amount of milk and milk products (Table 4.28). Adequacy of milk and milk products revealed highly contrasting results for girls (17-18Y), where 50 per cent girls had inadequate amount, followed by 33.3 per cent in marginally inadequate and only 16.6 per cent in adequate category.

Perusal of data in Table 4.29 revealed that 100 per cent of the boys consumed adequate amount of milk and milk products as compared to only 11.1 per cent girls. The daily consumption of milk and milk products was marginally adequate by majority of girls (55.5%) remaining girls (33.3%) consumed marginally inadequate amounts.

4.10.8 Fats and oils

Sex-wise (17-18Y) comparison (Table 4.28) showed that majority of boys (87.5%) were taking marginally adequate amount of fat and oils while a higher percentage of girls were taking inadequate (58.3%) amount while 33.3 and 8.33 per cent consumed adequate and marginally inadequate amounts of fats and oils, respectively.

Consumption of fats and oils of boys and girls (18-21Y) has been depicted in Table 4.29. It was found that 77.2 per cent of boys were taking adequate amounts of fats and oils followed by 13.6 and 9.1 per cent who took marginally inadequate and marginally adequate amounts daily, respectively. On the other hand, most of the girls (44.4%) consumed marginally adequate amounts of fats and oils; equal percentage (22.2%) of girls took adequate and marginally inadequate amounts while only 11.1 per cent were consuming inadequate amounts of fats and oils daily.

4.10.9 Sugar and jaggery

Data compiled in Table 4.28 unveils that the 100 per cent boys (17-18Y) consumed marginally inadequate amount of sugar and jaggery while majority of girls (50%) took sugar and jaggery less than 50 per cent of RDI followed by 33.3 per cent and 16.6 per cent who consumed marginally inadequate and marginally adequate amounts of sugar and jaggery, respectively.

Equal percentage of boys (50%) of 18-21 years consumed adequate and marginally adequate levels of sugar and jaggery while higher percentage of girls (33.3%) of the same age group took below 50 per cent of RDI. Rest of the girls (27.7%, 22.2% and 16.6%) consumed marginally adequate, marginally inadequate and adequate amounts of sugar and jaggery, respectively (Table 4.29).

Table 4.28 : Sex-wise comparison in adequacy of food intake of college going students (17-18Y)

Category of adequacy	Cereals		Pulses		Roots & tubers		Green leafy vegetables		Other vegetables		Fruits		Milk & milk products		Fats and oils		Sugar and jiggery	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
I	3 (37.5)	6 (50)	2 (25)	-	-	-	4 (50)	5 (41.6)	-	-	3 (37.5)	4 (33.3)	3 (37.5)	2 (16.6)	-	4 (33.3)	-	-
II	3 (37.5)	4 (33.3)	4 (50)	-	5 (62.5)	-	-	-	-	-	2 (25)	2 (16.6)	4 (50)	-	7 (87.5)	-	-	2 (16.6)
III	2 (25)	2 (16.6)	2 (25)	8 (66.6)	3 (37.5)	6 (50)	4 (50)	7 (58.3)	6 (75)	-	3 (37.5)	6 (50)	-	4 (33.3)	-	1 (8.33)	8 (100)	4 (33.3)
IV	-	-	-	4 (33.3)	-	6 (50)	-	-	2 (25)	12 (100)	-	-	1 (12.5)	6 (50)	1 (12.5)	7 (58.3)	-	6 (50)

Values in parentheses indicate percentage

I 100 per cent and above (Adequate)

II 75 to 99.9 per cent of RDI (Marginally adequate)

III 50 to 74.9 per cent of RDI (Marginally inadequate)

IV Below 50 per cent of RDI (Inadequate)

Table 4.29 : Sex-wise comparison in adequacy of food intake of college going students (18-21Y)

Category of adequacy	Cereals		Pulses		Roots & tubers		Green leafy vegetables		Other vegetables		Fruits		Milk & milk products		Fats and oils		Sugar and jaggery	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
I	3 (13.6)	2 (11.1)	12 (54.5)	-	1 (4.55)	-	-	-	-	-	2 (9.1)	-	22 (100)	2 (11.1)	17 (77.2)	4 (22.2)	11 (50)	3 (16.6)
II	16 (72.7)	6 (33.3)	6 (27.3)	9 (50)	10 (45.4)	11 (61.1)	-	-	-	-	10 (45.4)	11 (61.1)	-	10 (55.5)	2 (9.1)	8 (44.4)	11 (50)	5 (27.7)
III	3 (13.6)	8 (44.4)	4 (18.2)	6 (33.3)	-	7 (38.8)	12 (54.5)	-	4 (18.2)	-	7 (31.8)	7 (38.8)	-	6 (33.3)	3 (13.6)	4 (22.2)	-	4 (22.2)
IV	-	2 (11.1)	-	3 (16.6)	11 (50)	-	10 (45.4)	18 (100)	18 (81.8)	18 (100)	3 (13.6)	-	-	-	-	2 (11.1)	-	6 (33.3)

Values in parentheses indicate percentage

I 100 per cent and above (Adequate)

II 75 to 99.9 per cent of RDI (Marginally adequate)

III 50 to 74.9 per cent of RDI (Marginally inadequate)

IV Below 50 per cent of RDI (Inadequate)

4.11 Nutrient intake of college going students

Data on daily mean nutrient intake of college going students has been presented in tables 4.30- 4.32 (Fig. 4.14-4.16).

4.11.1 Energy

Daily mean intake of energy among college going girls and boys of 17-18 years was 2215.5 Kcal/day and 2881 Kcal/day which was 90.7 per cent and 95.3 per cent of RDA (Table 4.30). The results (Table 4.11) highlighted the non-significant differences with RDA.

Data on Table 4.31 indicted that girls and boys (18-21Y) were taking 1706 Kcal/day (89.7 % of RDA) and 2139.2 Kcal/day (92.2 % of RDA) and the differences were non-significant when compared to their respective RDAs.

Results (Table 4.32) highlighted the non-significant difference in mean energy intake of government and private college going students. Students from government college had slightly better intake of energy 1828.8 Kcal/day in comparison to private college students (1657.5 Kcal/day).

4.11.2 Protein

Results regarding mean daily intake of protein (Table 4.30) revealed that mean intake of protein by the college going girls (17-18Y) was 54.7g/day (98.5% of RDA) and the difference was non-significant. Protein intake of boys was found to be 72.4g/day which was non-significantly higher than RDA.

Protein intake was 42.7 per cent of RDA among girls (18-21Y) which was significantly ($p<0.05$) lower than the RDA ($t=4.75$). The daily mean intake of protein of boys was (18-21Y) 58.1g/day which was 96.8 per cent of RDA (Table 4.31).

Protein intake of private college students was found to be lower (50.5g) than government college students (58.9g) but the differences were not significant (Table 4.32).

4.11.3 Fat

Mean fat intake of college going students of 17-18 (Table 4.30) years was found to be 37.8g/day (108.2% of RDA) in girls which was significantly ($p<0.05$) higher than the RDA and 58.5g/day (117% of RDA) in boys which was again slightly higher than the RDA but not significant.

Further, the per cent intakes of fat were 110.5 per cent in girls and 121 per cent in boys of 18-21 years and these were significantly ($p<0.05$) higher than their respective RDAs in both the cases (Table 4.31).

The college-wise difference with regards to fat intake was found to be non-significant. The fat intake of government college respondents was 43.8g/day while in private college students, it was 36.5g/day (Table 4.32).

4.11.4 Calcium

Mean daily calcium consumption of 17-18 years of college going girls (790.2mg) and boys (1061.6mg) was lower than their respective RDAs but it was not significantly lower (Table 4.30).

Calcium intake of both the girls and boys (18-21Y) has been depicted in Table 4.31. Girls were consuming significantly ($p<0.05$) higher amount of calcium (775.3mg) than the RDA. Similarly, boys also took significantly ($p<0.05$) higher amount of calcium (981.7mg) than the RDA; it was 163.6 per cent of the RDA.

Results in table 4.32 illustrated that calcium intakes of both government (899mg) and private college (885.2mg) students were almost similar as no significant difference was found.

4.11.5 Iron

The data on nutrient intake illustrated (Table 4.30) that daily intake of iron by college going girls and boys (17-18Y) was 13.8mg and 13.4mg, respectively against the daily recommended dietary allowances of 26mg and 28mg, respectively which were significantly ($p<0.05$) lower than their respective RDAs.

Data compiled in Table 4.31 indicated that both boys (12.8 mg) and girls (11.3 mg) were taking less amount of iron daily and intake was significantly ($p<0.05$) lower as compared to their RDAs.

A significant ($p<0.05$) difference for iron intake was observed among the respondents of government and private colleges (Table 4.32). Data showed that government and private college going students were taking 14.4mg and 10.8mg iron per day, respectively.

4.11.6 Retinol

The data (Table 4.30) on daily mean daily nutrient intake further depicted that the average intake of retinol of college going students (17-18Y) was 967.8µg and 850.5µg for girls and boys, respectively and these intakes were almost similar to their respective RDAs.

Data given in table 4.31 indicated that girls (18-21Y) were taking 967.3µg retinol per day which was non- significantly higher than the RDA (600 µg) and the daily intake of retinol of boys of the same age group was 1388.4µg (231.4% of RDA) and was significantly ($p<0.05$) higher than the RDA.

In comparison to private college students (697.6µg/day), government college students were taking higher amount (1014.7µg/day) of retinol and the difference was significant ($p<0.05$) (Table 4.32).

4.11.7 Folic Acid

Perusal of data presented in Table 4.30 illustrated that the mean daily intake of folic acid of girls was 60.2 per cent (120.4µg) of the RDA and was significantly ($p<0.05$) lower than the RDA while the intake of folic acid of boys was 153.6 µg which was almost similar of its RDAs.

Among both the girls and boys of 18-21 years, their mean daily intake of folic acid was significantly ($p<0.05$) lower than the RDA i.e. 99.7µg and 109.7µg (49.8% and 54.8% of RDA), respectively.

The students of the government college were consuming 131.1µg folic acid per day while private college respondents consumed 98.3µg/day but this variation was non-significant (Table 4.32).

4.11.8 Thiamine

The intake of thiamine of girls (17-18Y) was significantly ($p<0.05$) higher than the RDA (110% of the RDA) while that of boys was 1.5mg/day (105.3% of RDA) which was almost similar to its RDA (Table 4.30).

Daily thiamine intakes of boys (102.5% of RDA) and girls (110% of RDA) of 18-21 year was almost similar to their respective RDAs.

A non-significant difference was found between thiamine intakes of both government (1.2mg) and private college (1.1mg/day) students; they were consuming almost equal amounts of thiamine in daily diets (Table 4.32).

4.11.9 Riboflavin

Table 4.30 revealed that mean intake of riboflavin of girls was 1.3mg/day (108.3% of RDA) which was non-significantly higher than the RDA. Among boys, their mean intake was 1.47mg/day (77.7% of RDA) which was non-significantly lower than the RDA.

Data in table 4.31 illustrated that the mean daily riboflavin intake of girls and boys (18-21Y) was 1.1mg (91.6% of RDA) and 0.9mg (81.8% of RDA), respectively; both had significantly ($p<0.05$) lower intakes than the RDA.

Riboflavin intakes of government and private college students were almost equal i.e. 1.1mg and 1.0mg per day, respectively (Table 4.32).

4.11.10 Vitamin C

Table 4.30 highlighted the daily mean intake of vitamin C of college going students (17-18Y). The intake of vitamin C was higher among boys i.e. 144.4mg/day (361% of RDA) which was significantly ($p<0.05$) higher than the RDA while girls were taking 34.1mg/day (85.2% of RDA) which was non-significantly lower than the RDA.

Boys (18-21Y) were taking 79.5mg vitamin C per day (198.7% of RDA) and it was significantly ($p<0.05$) higher than the RDA while girls of the same age group consumed 35.4mg vitamin C daily (88.5% of RDA) which was non-significantly lower than the RDA (Table 4.31).

Respondents from private college were taking higher amounts of vitamin C (73.4mg/day) than those from the government college (58.2mg/day) but this difference was non-significant (Table 4.32).

Table 4.30 : Sex-wise comparison of daily mean nutrient intake by college going students with RDI (17- 18Y)

Nutrient	Recommended Dietary Intake (RDI)	Actual Intake		Recommended Dietary Intake (RDI)	Actual Intake	
		Girls (n=12)	't' value		Boys (n=8)	't' value
Energy(kcal)	2440.0	2215.0±56.36 (90.7)	1.06	3020.0	2881.0±227.11 (95.3)	0.75
Protein(g)	55.5	54.7±2.89 (98.5)	0.26	61.5	72.45±7.78 (117.7)	1.40
Visible fat(g)	35.0	37.8±0.58 (108.2)	9.79*	50.0	58.5±10.16 (117.0)	1.72
Calcium(mg)	800.0	790.2±72.26 (98.7)	0.13	800.0	1061.6±271.15 (132.7)	0.96
Iron(mg)	26.0	13.8±1.15 (53.1)	10.6*	28.0	13.4±1.81 (47.8)	8.02*
Retinol(µg)	600.0	967.8±380.84 (161.3)	0.96	600.0	850.5±324.70 (141.7)	0.77
Folic Acid(µg)	200.0	120.4±11.10 (60.2)	7.16*	200.0	153.6±41.70 (76.8)	1.11
Thiamine(mg)	1.0	1.1±0.09 (110.0)	2.0*	1.5	1.58±0.24 (105.3)	0.16
Riboflavin(mg)	1.2	1.3±0.14 (108.3)	1.07	1.8	1.47±0.28 (77.7)	1.17
Vitamin C(mg)	40	34.1±5.63 (85.2)	1.04	40.0	144.4±68.06 (361)	1.53

Values are mean ±SD
* Significant at 5% level
Values in parentheses indicate percentage (%RDI)
áôvalues showing comparison of daily mean nutrient intake and RDA of girls and boys

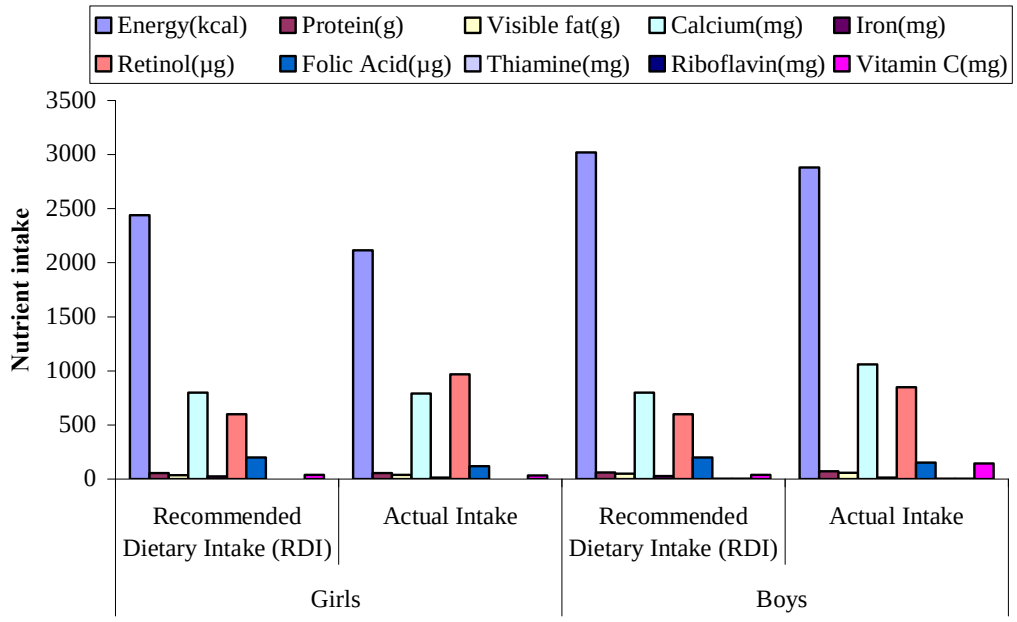

Fig. 4.14 : Sex-wise comparison of daily mean nutrient intake by college going students with RDI (17- 18Y)

Table 4.31 : Sex-wise comparison of daily mean nutrient intake by college going students with RDI (18-21Y)

Nutrient	Recommended Dietary Intake (RDI)	Actual Intake		Recommended Dietary Intake (RDI)	Actual Intake	
		Girls (n=18)	't' value		Boys (n=22)	't' value
Energy(kcal)	1900	1706.0±78.16 (89.7)	1.01	2320	2139.2±105.89 (92.2)	0.98
Protein(g)	66	42.7±2.58 (64.6)	4.75*	60	58.1±4.44 (96.8)	0.42
Visible fat(g)	20.0	22.1±0.09 (110.5)	9.4*	25.0	30.2±3.16 (121)	3.16*
Calcium(mg)	600	775.3±62.89 (129)	2.78*	600	981.7±94.82 (163.6)	4.02*
Iron(mg)	21	11.3±1.08 (53)	8.91*	17	12.8±1.54 (75.2)	2.72*
Retinol(µg)	600	967.3±297.74 (161.2)	1.23	600	1388.4±344.73 (231.4)	2.28*
Folic Acid(µg)	200	99.7±10.24 (49.8)	9.79*	200	109.7±15.94 (54.8)	5.66*
Thiamine(mg)	1.0	1.1±0.11 (110)	0.45	1.2	1.23±0.11 (102.5)	0.09
Riboflavin(mg)	1.2	1.1±0.10 (91.6)	2.70*	1.1	0.9±0.07 (81.8)	3.28*
Vitamin C(mg)	40	35.4±4.18 (88.5)	1.08	40	79.5±16.07 (198.7)	2.45*

Values are mean ±SD
* Significant at 5% level
Values in parentheses indicate percentage (%RDI)
άôvalues showing comparison of daily mean nutrient intake and RDA of girls and boys

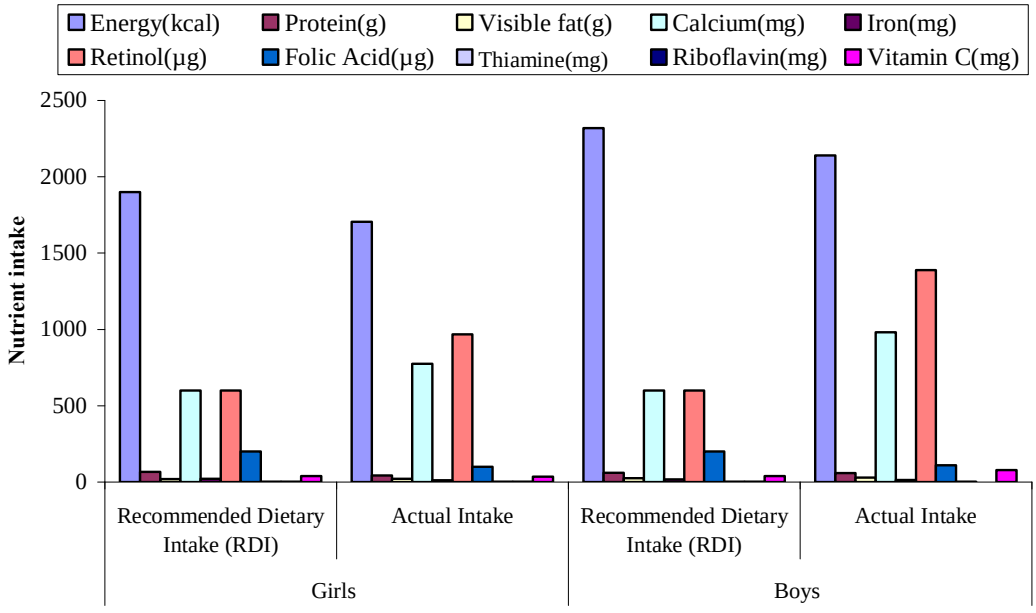

Fig. 4.15 : Sex-wise comparison of daily mean nutrient intake by college going students with RDI (18-21Y)

Table 4.32 : College-wise comparison of daily mean nutrient intake of college going students (17-21Y)

Nutrients	Govt. College (n=30)	Private College (n=30)	't' Value
Energy(kcal)	1828.8±564.68	1657.5±425.97	1.32
Protein(g)	58.9±18.45	50.5±18.61	1.76
Visible Fat(g)	43.8±23.23	36.4±6.54	1.67
Calcium(mg)	899±505.93	885.2±348.43	0.12
Iron(mg)	14.4±6.17	10.8±4.3	2.6*
Retinol(µg)	1514.8±1685.91	697.6±776.51	2.41*
Folic Acid(µg)	131.1±62.57	98.3±72.03	1.88
Thiamine(mg)	1.2±0.50	1.1±0.50	1.25
Riboflavin(mg)	1.1±0.45	1±0.56	0.98
Vitamin C(mg)	58.2±51.24	73.4±116.09	0.65

Values are mean ±SD
* Significant at 5% level
άôvalue showing comparison among govt. college and private college

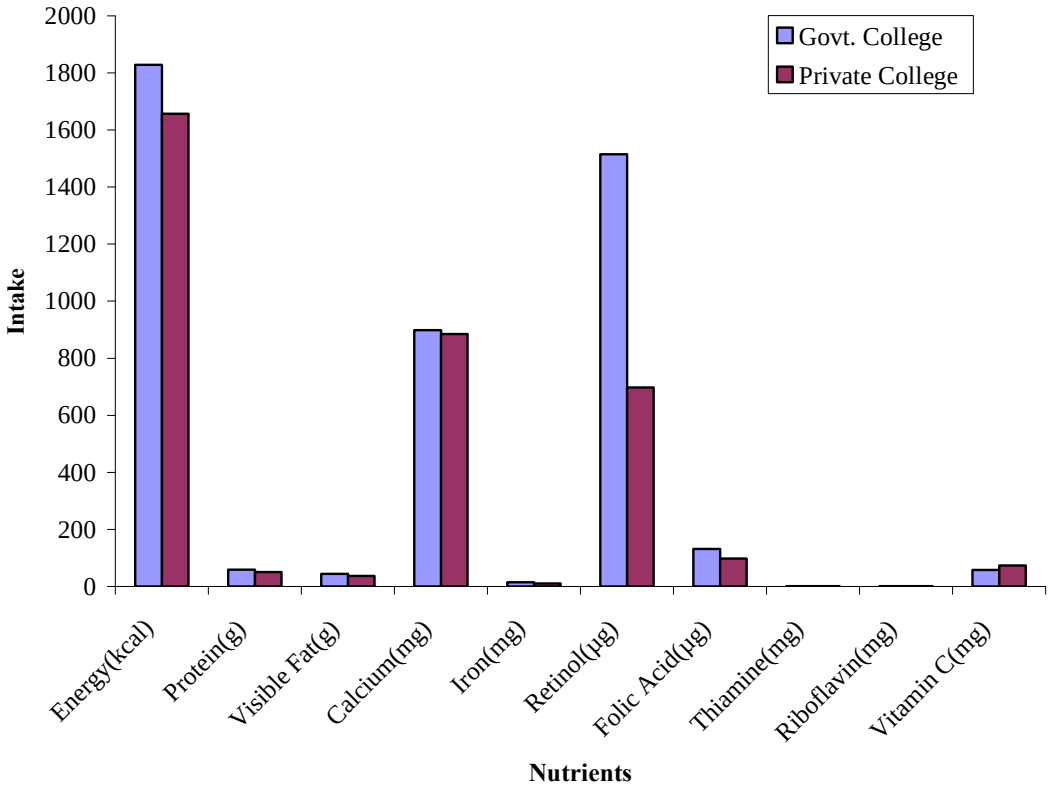

Fig. 4.16 : College-wise comparison of daily mean nutrient intake of college going students (17-21Y)

4.12 Adequacy of nutrient intake by college going students

The results regarding adequacy of nutrient intake have been depicted in Tables 4.33 and 4.34. The adequacy of different nutrients as compared to their respective RDAs has been discussed individually as given under:

4.12.1 Energy

Perusal of results (Table 4.33) showed that the energy intake by majority (63.5%) of the boys (17-18Y) was marginally adequate; 25 and 12.5 per cent of the boys were taking marginally inadequate and adequate amount of energy, respectively. Majority (91.67%) of the girls (17-18Y) were taking marginally adequate energy while only 8.33 per cent took marginally inadequate amount of energy daily.

Table 4.34 illustrated the energy intakes of girls and boys of 18-21 years. Almost half of the boys consumed marginally adequate amount of energy followed by 36.6 and 13.6 per cent respondents who had marginally inadequate and adequate energy intakes, respectively. Equal percentage (44.4%) of girls had marginally adequate and marginally inadequate energy intakes while the rest (11.1%) had adequate amount of energy intake daily.

4.12.2 Protein

Data (Table 4.33) related to adequacy of protein determined that most of the boys (62.6%) had adequate protein intake, 37.5 per cent were marginally adequate and 12.5 per cent were inadequate in protein intake. On the other hand, half of the girls were marginally adequate in their protein intake; 41.6 and 8.33 per cent took adequate and marginally inadequate amounts of protein daily, respectively.

The protein intake of boys and girls (18-21Y) has been depicted in Table 4.34 and it was found that 45.5 per cent boys had adequate protein intake daily followed by 27.2, 18.1 and 9.1 per cent who consumed marginally inadequate, marginally adequate and inadequate amounts, respectively. Only 38.8 per cent of the girls were taking marginally adequate protein on daily basis, rest 33.3, 16.6 and 11.1 per cent had marginally inadequate, adequate and inadequate intake of protein, respectively.

4.12.3 Fat

Marginally adequate intake of fat was observed in most of the boys (87.5%) of 17-18 years. The remaining (12.5%) were consuming inadequate amount of fat. Results in Table 4.33 concluded that inadequate amount of fat was taken by majority (58.3%) of the girls. Second highest percentage of girls (33.3%) was ‘adequate’ level of fat intake while remaining (8.33%) had marginally inadequate intake of fat.

Majority (77.2%) of the boys (18-21Y) were having adequate amount of fat as compared to most (44.4%) of the girls of the same age group who consumed marginally adequate amount of fat and equal percentage (22.2%) of girls had adequate and marginally inadequate amount, respectively. Rest of the boys were having marginally inadequate (13.6%) and marginally adequate (9.1%) fat intake while the remaining girls (11.1) had inadequate daily intake of fat (Table 4.34).

4.12.4 Calcium

Results in Table 4.33 concluded that majority (62.5 %) of the boys (17-18Y) were taking adequate amount of calcium, whereas 25and 12.5 per cent of them consumed inadequate and marginally inadequate amount of calcium, respectively. While majority (58.3%) of girls had adequate amounts of calcium, equal percentage (16.6%) of girls consumed marginally adequate and marginally inadequate amounts and remaining (8.3%) girls were taking inadequate amounts.

Table 4.34 displayed that 90.9 per cent of boys (18-21Y) were consuming calcium adequately and equal percentage (4.5%) were taking marginally inadequate and inadequate amounts of calcium. Calcium intakes of 77.7 per cent of girls were adequate, 11.1 per cent took marginally adequate amounts of calcium while equal percentage (5.5%) of girls had marginally inadequate and intakes of adequate calcium daily.

4.12.5 Iron

The finding of the present study highlighted that 75 per cent of the college going boys (17-18Y) consumed inadequate amount of iron in their daily diet. Equal percentage (12.5%) had marginally adequate and marginally inadequate amounts of iron and no one was found in óadequateô category of adequacy. Most (58.3%) of the girls (17-18Y) were consuming marginally inadequate iron intake, 25 per cent consumed marginally adequate amounts and 16.6 per cent had adequate amounts of iron (Table 4.33).

Among boys (18-21Y), 36.6 per cent consumed marginally inadequate and inadequate amounts of iron daily; 22.7 per cent took adequate amounts and only 4.5 per cent had marginally adequate iron intake. Half of the girls (18-21Y) consumed inadequate iron daily, 27.7 per cent had marginally inadequate amounts while 22.2 per cent consumed marginally adequate iron daily (Table 4.34).

4.12.6 Retinol

Data (Table 4.33) related to adequacy of retinol determined that majority (62.5%) of the boys (17-18Y) consumed retinol adequately. Equal percentage of boys (12.5%) took marginally adequate, marginally inadequate and inadequate amount of retinol. On the contrary, most (66.6%) of the girls (17-18Y) were consuming marginally inadequate levels of retinol and equal percentage (16.6%) of girls consumed adequate and marginally adequate retinol daily.

Perusal of results in Table 4.34 highlighted that 45.4, 27.2, 18.2 and 9.1 per cent of boys (18-21Y) consumed adequate, inadequate, marginally inadequate and marginally adequate amounts of retinol, respectively. Among girls (18-21Y), 33.3 per cent had adequate retinol intake while 11.1 per cent consumed marginally adequate amounts. Equal percentages of girls (27.7%) were taking marginally inadequate and adequate retinol daily.

4.12.7 Folic acid

Data (Table 4.33) related to adequacy of folic acid determined that half of the boys (17-18Y) were taking folic acid óinadequatelyô. Adequate amounts of folic acid were taken by 25 per cent boys only while equal percentage (12.5%) consumed marginally adequate and marginally inadequate amount of folic acid daily. Fifty per cent of the girls consumed

marginally inadequate while 33.3 and 16.6 per cent had marginally adequate and adequate levels of folic acid, respectively.

Table 4.34 illustrated the folic acid intakes of girls and boys of 18-21 years. Most of the boys (59.1%) had inadequate intake of folic acid. Equal percentage (13.6%) of boys were adequate, marginally adequate and marginally inadequate in their folic acid intakes. Half of the girls had marginally inadequate folic acid daily followed by 44.4 per cent who consumed inadequate amounts and 5.5 per cent took marginally adequate folic acid.

4.12.8 Thiamine

Half of the boys (17-18Y) had adequate while other half had marginally inadequate levels of thiamine. Majority of the girls (66.6%) consumed thiamine adequately while 25 per cent of them were taking marginally adequate amounts; 8.3 per cent girls had marginally inadequate thiamine daily (Table 4.33).

The thiamine intake of boys and girls (18-21Y) has been depicted in Table 4.34 and it was found that 40.9 per cent boys had marginally inadequate thiamine intake daily followed by 36.4 and 22.7 per cent who consumed adequate and marginally adequate amounts, respectively; most of the girls (44.4%) were taking adequate thiamine on daily basis. Marginally adequate and marginally inadequate amounts were taken by equal percentage of girls (22.2%); rest 11.1per cent had inadequate amounts of it.

4.12.9 Riboflavin

Half of the boys (17-18Y) consumed marginally adequate riboflavin while one fourth boys consumed inadequate levels of riboflavin. Equal percentage (12.5%) of boys took adequate and marginally inadequate amounts of riboflavin. Most (66.6%) of the girls (17-18Y) were taking riboflavin adequately followed by 16.6 per cent who consumed marginally adequate amounts while equal percentage (8.3%) of girls took marginally inadequate and inadequate riboflavin (Table 4.33).

Data in table 4.34 highlighted that 36.4 and 18.2 per cent of boys (18-21Y) consumed marginally adequate and marginally inadequate amounts of riboflavin, respectively. And an equal percentage (22.7%) of boys took adequate and inadequate amounts. Among girls (18-21Y), 38.8 per cent had marginally adequate riboflavin intake while 27.7 and 22.2 per cent consumed adequate and marginally inadequate amounts, respectively. Remaining girls (11.1%) had marginally inadequate levels of riboflavin daily.

4.12.10 Vitamin C

It is evident from the Table 4.33 that 100 per cent of the boys (17-18Y) were taking adequate amount of vitamin C. Adequacy (41.6%), marginal inadequacy (33.3%) and inadequacy (25%) of vitamin C was also observed in girls (17-18Y).

Tables 4.34 showed that majority (77.2%) of boys (18-21Y) were taking vitamin C adequately and only 4.5 per cent had inadequate intake. Equal percentages of boys (9.15) took vitamin C marginally adequately and marginally inadequately, respectively. On the other hand, 44.4 per cent girls (18-21Y) had adequate vitamin C intake and 11.1 per cent had marginally adequate amounts. An equal percentage of girls (22.2%) consumed vitamin C between 50 to 74.9 per cent of RDA and below 50 per cent RDA.

Table 4.33 : Sex-wise difference in adequacy of nutrient intake of college going students (17-18Y)

Category of adequacy	Energy		Protein		Fat		Calcium		Iron		Retinol		Folic acid		Thiamine		Riboflavin		Vit-C	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
I	1 (12.5)	-	4 (62.5)	5 (41.6)	-	4 (33.3)	5 (62.5)	7 (58.3)		2 (16.6)	5 (62.5)	2 (16.6)	2 (25)	2 (16.6)	4 (50)	8 (66.6)	1 (12.5)	8 (66.6)	8 (100)	5 (41.6)
II	5 (62.5)	11 (91.67)	3 (37.5)	6 (50)	7 (87.5)	-		2 (16.6)	1 (12.5)	3 (25)	1 (12.5)	2 (16.6)	1 (12.5)	4 (33.3)	-	3 (25)	3 (50)	2 (16.6)	-	
III	2 (25)	1 (8.33)	-	1 (8.33)	-	1 (8.33)	1 (12.5)	2 (16.6)	1 (12.5)	7 (58.3)	1 (12.5)	8 (66.6)	1 (12.5)	6 (50)	4 (50)	1 (8.3)	1 (12.5)	1 (8.3)	-	4 (33.3)
IV	-	-	1 (12.5)	-	1 (12.5)	7 (58.3)	2 (25)	1 (8.3)	6 (75)	-	1 (12.5)	-	4 (50)	-	-	-	2 (25)	1 (8.3)	-	3 (25)

Values in parentheses indicate percentage

I 100 per cent and above (Adequate)

II 75 to 99.9 per cent of RDA (Marginally adequate)

III 50 to 74.9 per cent of RDA (Marginally inadequate)

IV Below 50 per cent of RDA (Inadequate)

Table 4.34 : Sex-wise difference in adequacy of nutrient intake of college going students (18-21Y)

Category of adequacy	Energy		Protein		Fat		Calcium		Iron		Retinol		Folic acid		Thiamine		Riboflavin		Vit-C	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
I	3 (13.6)	2 (11.1)	10 (45.5)	3 (16.6)	17 (77.2)	4 (22.2)	20 (90.9)	14 (77.7)	5 (22.7)	-	10 (45.4)	6 (33.3)	3 (13.6)		8 (36.4)	8 (44.4)	5 (22.7)	5 (27.7)	17 (77.2)	8 (44.4)
II	11 (50)	8 (44.4)	4 (18.1)	7 (38.8)	2 (9.1)	8 (44.4)	-	2 (11.1)	1 (4.5)	4 (22.2)	2 (9.1)	2 (11.1)	3 (13.6)	1 (5.5)	5 (22.7)	4 (22.2)	8 (36.4)	7 (38.8)	2 (9.1)	2 (11.1)
III	8 (36.6)	8 (44.4)	6 (27.2)	6 (33.3)	3 (13.6)	4 (22.2)	1 (4.5)	1 (5.5)	8 (36.6)	5 (27.7)	4 (18.2)	5 (27.7)	3 (13.6)	9 (50)	9 (40.9)	4 (22.2)	4 (18.2)	2 (11.1)	2 (9.1)	4 (22.2)
IV	-	-	2 (9.1)	2 (11.1)	-	2 (11.1)	1 (4.5)	1 (5.5)	8 (36.6)	9 (50)	6 (27.2)	5 (27.7)	13 (59.1)	8 (44.4)	-	2 (11.1)	5 (22.7)	4 (22.2)	1 (4.5)	4 (22.2)

Values in parentheses indicate percentage

I 100 per cent and above (Adequate)

II 75 to 99.9 per cent of RDA (Marginally adequate)

III 50 to 74.9 per cent of RDA (Marginally inadequate)

IV Below 50 per cent of RDA (Inadequate)

4.13 Diet diversity score (DDS) of college going students

4.13.1 Frequency of the college going students as per DDS

The data presented in table 4.35 (Fig. 4.17) highlighted that from a total of 60 students, majority of the students (46.6%) consumed six food groups, 35 per cent had five food groups, 11.6 per cent took seven food groups and equal percentage (3.3%) of students had eight and four food groups out of total of 13 food groups.

Table 4.35: Frequency of the college going students as per DDS (n=60)

Respondents who consumed	Frequency
All 13 food groups	0(0)
12 food groups	0(0)
11 food groups	0(0)
10 food groups	0(0)
9 food groups	0(0)
8 food groups	2(3.3)
7 food groups	7(11.6)
6 food groups	28(46.6)
5 food groups	21(35)
4 food group	2(3.3)
3 food groups	0(0)
2 food groups	0(0)
1 food group	0(0)

Values in parentheses indicate percentage

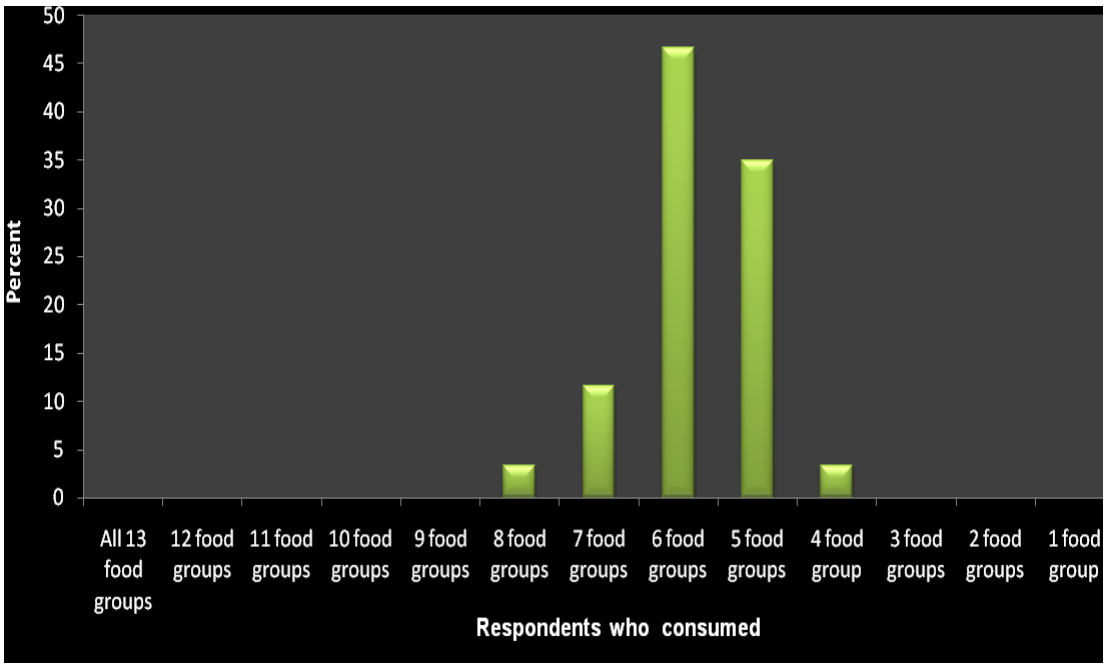

Fig. 4.17 : Frequency of the college going students as per DDS

4.13.2 Percentage of students consuming different food groups by DDS

Table 4.36 illustrated a cross tabulation of DDS against the individual food groups to provide a picture of how diets diversify. Diets continued to diversify as scores increases. All of the students consumed items from the four food groups viz. starchy staples, all other fruits and vegetables and vitamin-C rich fruits. With the increasing DDS, the consumption percentage of all legumes and nuts and dairy products increased. The consumption of vitamin A-rich dark green leafy vegetables, vitamin A-rich deep yellow, orange and red vegetables and vitamin C-rich vegetables was restricted to higher DDS i.e. 8.

Table 4.36 : Percentage of students consuming different food groups by DDS

(n=60)

	DDS												
Food groups	**1**	**2**	**3**	**4 (n=2)**	**5 (n=21)**	**6 (n=28)**	**7 (n=7)**	**8 (n=2)**	**9**	**10**	**11**	**12**	**13**
All starchy staples	-	-	-	100	100	100	100	100	-	-	-	-	-
All legumes and nuts	-	-	-	50	71.4	96.4	100	100	-	-	-	-	-
All dairy	-	-	-	50	95.2	100	100	100	-	-	-	-	-
All other fruits and vegetables	-	-	-	100	100	100	100	100	-	-	-	-	-
Vitamin C-rich fruits	-	-	-	100	100	100	100	100	-	-	-	-	-
Vitamin A-rich dark green leafy vegetables	-	-	-	-	4.7	17.5	42.8	100	-	-	-	-	-
Vitamin A-rich deep yellow, orange and red vegetables	-	-	-	-	-	10.7	42.8	100	-	-	-	-	-
Vitamin C-rich vegetables	-	-	-	-	23.8	60.71	42.8	100	-	-	-	-	-
Vitamin A-rich fruits	-	-	-	-	-	3.5	14.2	-	-	-	-	-	-
Organ meat	-	-	-	-	-	-	-	-	-	-	-	-	-
Eggs	-	-	-	-	-	16.6	14.2	-	-	-	-	-	-
Small fish eaten whole with bones	-	-	-	-	-	-	-	-	-	-	-	-	-
All other flesh foods and miscellaneous small animal protein	-	-	-	-	-	-	14.2	-	-	-	-	-	-

4.13.3 Mean DDS of respondents

Table 4.37 showed that the mean DDS of respondents was 5.75. DDS of government and private college students was almost equal i.e. 5.79 and 5.73, respectively and the difference was non-significant (t=0.61). Sex-wise comparison showed that the DDS of both girls and boys was almost equal (5.85 and 5.72) and the difference was not significant.

Table 4.37 : Mean DDS of respondents and their college-wise and sex-wise comparison

Respondents	Mean DDS	't' value
Total (n=60)	5.75±0.82	-
Colleges:		
Govt. (n=30)	5.79±0.91	0.61
Private (n=30)	5.73±0.74	
Sex:		
Girls (n=30)	5.72±0.74	0.61
Boys (n=30)	5.85±0.91	

Values are mean ±SD
* Significant at 5% level
ótô value showing college-wise and sex-wise comparisons

4.13.4 Percentage of respondents who consumed different food groups

Table 4.38 showed the percentage of students who consumed each of the 13 food groups at least one of the two 24-recall days. No one consumed organ meat, small fish eaten whole with bones and all other flesh foods and only 1.6 per cent had miscellaneous small animal protein. All the students consumed one or more foods from the three food groups i.e. all starchy staples, all other fruits and vegetables and vitamin-C rich fruits. Majority of the students (98.3%) consumed dairy products. All legumes and nuts were consumed by 81.6 per cent of the respondents. Vitamin C-rich vegetables, vitamin C-rich dark green leafy vegetables, vitamin A-rich deep yellow, orange and red vegetables, vitamin A-rich fruits and eggs were taken by 46.6, 21.6, 15, 3.3 and 5 per cent of the students, respectively.

Table 4.38 : Percentage of respondents who consumed different food groups (n=60)

Food Group	Frequency
All starchy staples	60(100)
All legumes and nuts	49(81.6)
All dairy	59(98.3)
All other fruits and vegetables	60(100)
Vitamin C-rich fruits	60(100)
Vitamin A-rich dark green leafy vegetables	13(21.6)
Vitamin A-rich deep yellow, orange and red vegetables	9(15)
Vitamin C-rich vegetables	28(46.6)
Vitamin A-rich fruits	2(3.3)
Organ meat	0(0)
Eggs	3(5)
Small fish eaten whole with bones	0(0)
All other flesh foods and miscellaneous small animal protein	1(1.6)

Values in parentheses indicate percentage

4.13.5 Mean DDS by family income category

The data presented in Table 4.39 highlights the mean DDS by family income category and it was found that respondents with the highest DDS (6.1) had a family income between Rs.10-30,000/month. As the income decreased, DDS also decreased (5.8 and 5.7) and it was interesting to know that as the income increased, instead of increasing DDS again decreased (5.0 and 5.5).

Table 4.39 : Mean DDS by family income category

Family income category	DDS
<10,000/month	5.7±0.72
10-30,000/month	5.8±0.76
30-60,000/month	6.1±1.17
60,000-1 Lac/month	5.0±1.003
>1 Lac/month	5.5±0.71

Values are mean ±SD

4.14 Anthropometric measurements of college going students

The data on anthropometric measurements of school going children have been presented in Tables 4.40 and 4.41 (Fig. 4.18 and 4.19).

4.14.1 Height

Results in Table 4.40 described that the mean height of college going girls (17-18Y) was 158.7 cm which was significantly ($p<0.05$) higher than the reference value while the mean height of boys (17-18Y) was 172.2 cm which was non-significantly lower than the reference value.

The mean height of girls and boys of 18-21 years has been depicted in Table 4.41 and it was found that the mean height of the girls was 156.1 cm. Among boys mean height was 170.1 cm which was significantly ($p<0.05$) lower than the reference value.

4.14.2 Weight

The data presented in Table 4.40 and 4.41 indicates the mean weight of college going students. The mean weights of girls and boys of 17-18 years were 46.7 and 54.8kg which were significantly ($p<0.05$) lower than their respective reference values.

Girls (18-21Y) weighed 46.8kgs against the reference value of 55kgs which was significantly ($p<0.05$) lower while mean weight of the boys (18-21Y) was 60.2kgs which was little higher than the reference value (60kgs).

4.14.3 Waist-circumference

It was found (Table 4.40) that the mean value of waist circumference for girls (17-18Y) was 70.39 cm which was significantly ($p<0.05$) lower than the reference value and similarly it was significantly ($p<0.05$) lower for boys (79.4 cm) of 17-18 years.

The mean value of waist circumference for girls (18-21Y) was found to be 71.4 cm which was significantly ($p<0.05$) lower than the reference value and for boys (18-21Y) mean waist circumference was 80.8 cm which was significantly ($p<0.05$) lower (Table 4.41).

4.14.4 Waist-to-Hip ratio

Table 4.40 depicts that mean waist-to-hip ratio in girls (17-18Y) was 0.79 which was significantly ($p<0.05$) lower than the reference value (0.81) and in boys (17-18Y) it was 0.89 which was similar to reference value.

Waist-to-hip ratio of girls (18-21Y) was 0.79 which was significantly ($p<0.05$) lower than the reference value (0.81) while for boys, it was 0.88 was which was almost similar to the reference value i.e. 0.89 (Table 4.41).

Table 4.40 : Sex-wise comparison of anthropometric measurements of college going students with reference values (17-18Y)

Anthropometric measurements	Girls (n=28)			Boys (n=17)		
	Reference value	Observed value	't' value	Reference value	Observed value	't' value
Height (cm)	156.0	158.7±1.34	2.08*	173.0	172.24±1.59	0.47
Weight (kg)	52.10	46.7±1.39	3.84*	55.40	54.8±1.81	0.28
Waist circumference (cm)	80.0	70.39±1.41	6.81*	85.0	79.4±1.21	4.55*
Waist-to-Hip ratio	0.81	0.79±0.01	2.0*	0.89	0.89±0.01	0.0

Values are mean ±SD
* Significant at 5% level
άôvalue showing comparison of girls and boys with their respective reference values

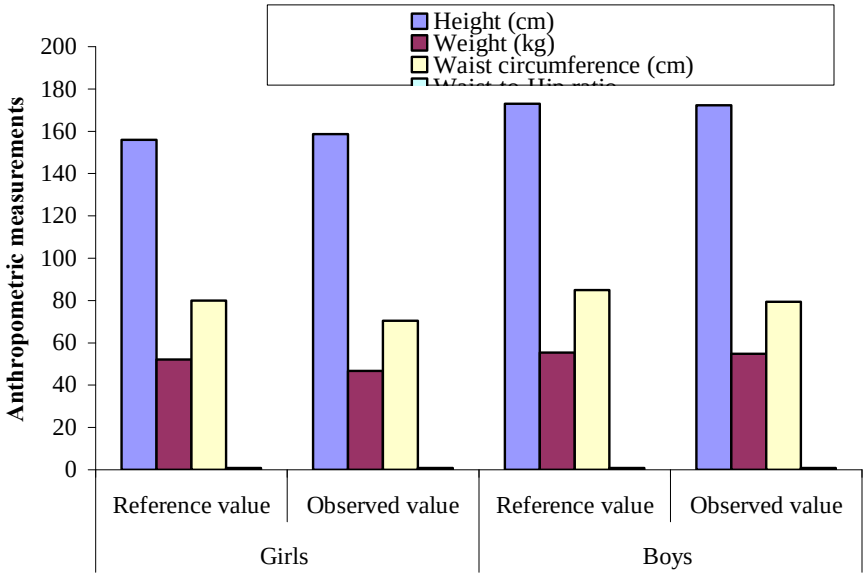

Fig. 4.18 : Sex-wise comparison of anthropometric measurements of college going students with reference values (17-18Y)

Table 4.41 : Sex-wise comparison of anthropometric measurements of college going students with reference values (18-21Y)

Anthropometric measurements	Girls (n=72)			Boys (n=83)		
	Reference value	Observed value	't' value	Reference value	Observed value	't' value
Height (cm)	156.0	156.1±0.68	0.11	172.05	170.1±0.60	3.1*
Weight (kg)	55.0	46.8±0.92	8.88*	60.0	60.2±1.05	0.26
Waist circumference (cm)	80.0	71.4±0.88	9.72*	85.0	80.8±0.86	4.80*
Waist-to-Hip ratio	0.81	0.79±0.01	2.0*	0.89	0.88±0.0	0.0

Values are mean ±SD
* Significant at 5% level
ά ô value showing comparison of girls and boys with their respective reference values

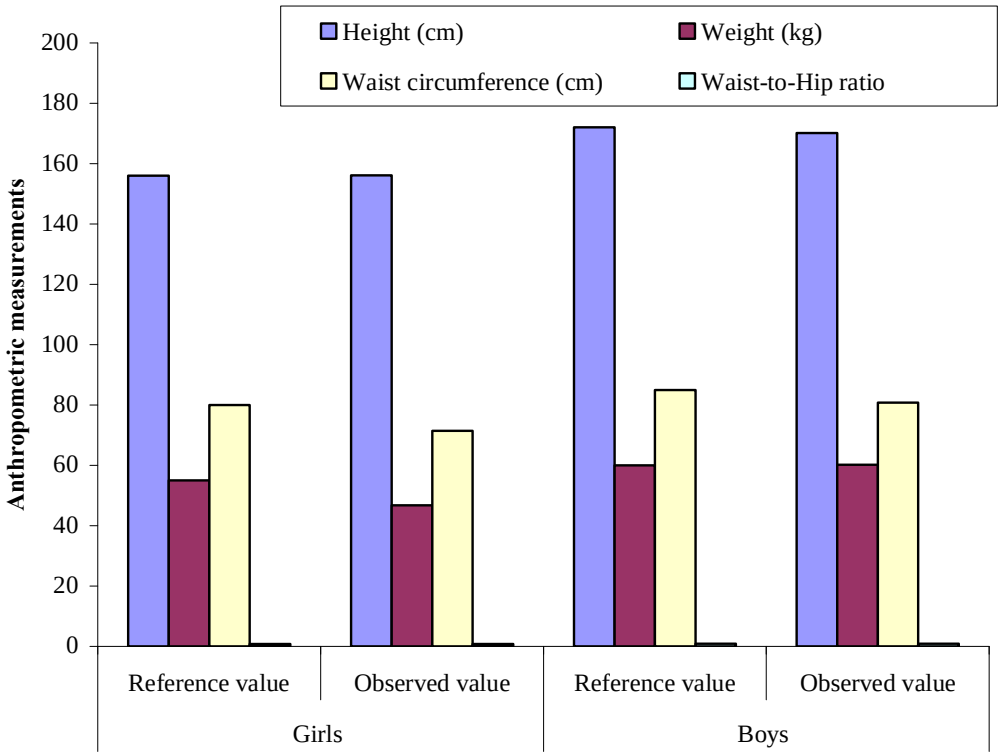

Fig. 4.19 : Sex-wise comparison of anthropometric measurements of college going students with reference values (18-21Y)

4.15 Prevalence of underweight, overweight and obesity among girls and boys

4.15.1 BMI

BMI classification is an indicator of underweight, overweight and obesity in adults. Data in Table 4.42 and Fig. 4.20 showed that 2 per cent girls and 14 per cent boys suffered from severe form of chronic energy deficiency while more girls (13%) as compared to boys (5%) suffered from moderate form of chronic energy deficiency. There were 14 per cent girls and 27 per cent boys who were suffering from mild form of chronic energy deficiency. It was found that 27 per cent girls and 25 per cent boys had low to normal weight while 33 per cent girls and 25 per cent boys had normal weight. In the overweight category, there were only 9 per cent girls and 4 per cent boys while only 2 per cent girls were found to be obese.

Table 4.42 : Prevalence of underweight, overweight and obesity among girls and boys as per BMI classification (17-21Y)

BMI class	College		Total (n=200)
	Girls (n=100)	Boys (n=100)	
<16.0 (Chronic energy deficiency-grade III severe)	2 (2)	14 (14)	16 (8)
16.0-17.0 (Chronic energy deficiency-grade II moderate)	13 (13)	5 (5)	18 (9)
17.0-18.5 (Chronic energy deficiency-grade I mild)	14 (14)	27 (27)	41 (20.5)
18.5-20.0 (Low weight- normal)	27(27)	25(25)	52(26)
20.0-25.0 (Normal)	33(33)	25(25)	58(29)
25.0-30.0 (Obese grade I)	9(9)	4(4)	13(6.5)
>30.0 (Obese grade II)	2(2)	0(0)	2(1)

Values in parentheses indicate percentage

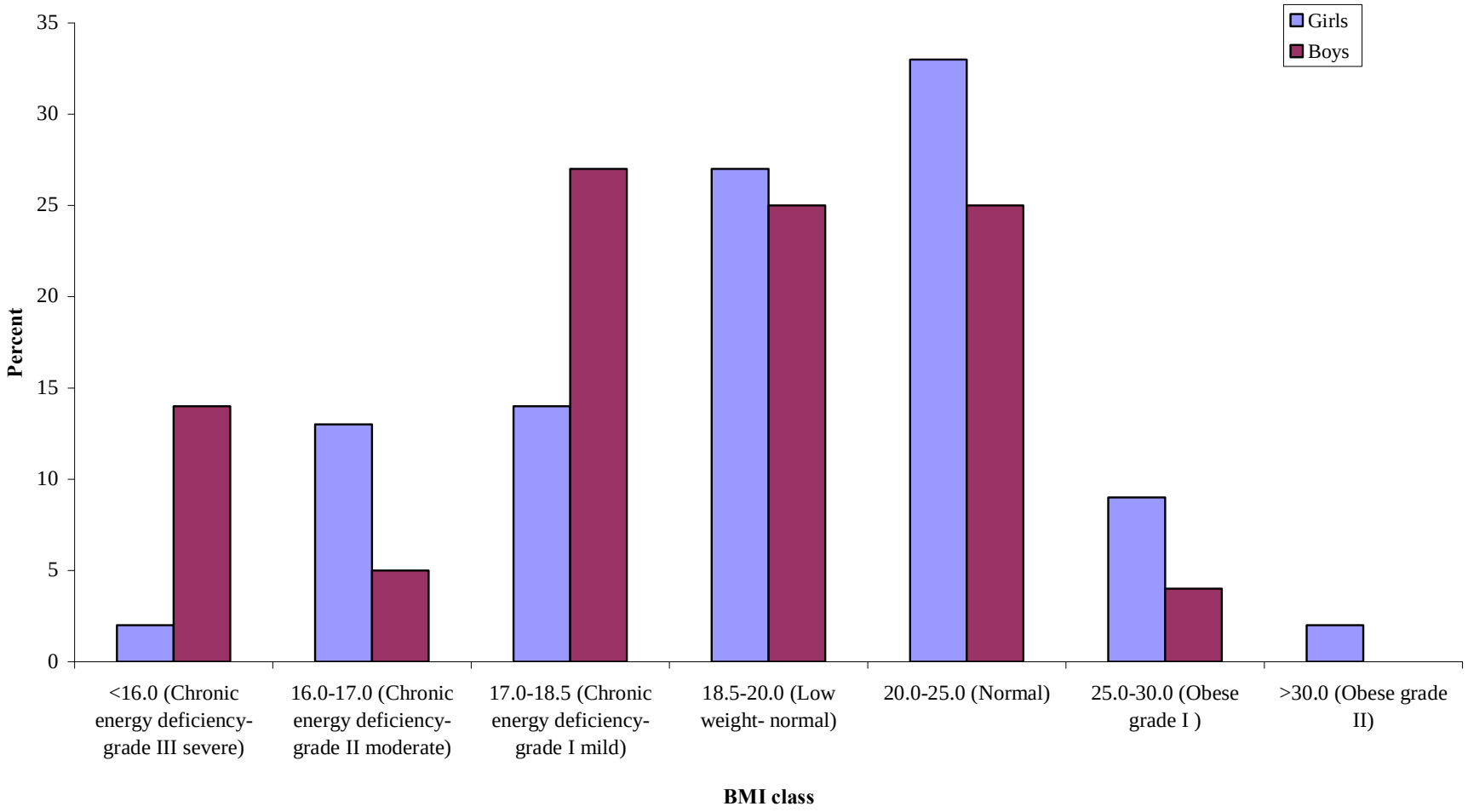

Fig. 4.20 : Prevalence of underweight, overweight and obesity among girls and boys as per BMI classification (17-21Y)

4.15.2 Body fat per cent

Body fat per cent indicates overweight and obesity among adults. In table 4.43, it was highlighted that 54 per cent girls and 65 per cent boys had normal values of body fat per cent and thus normal weight. There were 14 per cent girls and 13 per cent boys who were overweight. Obesity was prevalent among girls (32%) and boys (22%).

Table 4.43 : Prevalence of overweight and obesity among girls and boys as per body fat per cent (17-21Y)

Boys		Girls	
Reference value	**No. of respondents**	**Reference value**	**No. of respondents**
Ò16.9% (normal)	54(54)	Ò31.9% (normal)	65(65)
17-20.9% (overweight)	14(14)	17-20.9% (overweight)	13(13)
Ó21% (obese)	32(32)	Ó37%(obese)	22(22)

Values in parentheses indicate percentage

CHAPTER-V

DISSCUSSION

This chapter presents the discussions regarding the findings of the study. The relevant discussions have been presented under the following sub heads:

5.1 Background information of college going students

5.2 Information regarding mass media interaction

5.3 Programs preferred to be watched on television or internet by college going students

5.4 Information on respondentsô lifestyle and eating habits

5.5 Foods preferred by students in college canteen

5.6 Information regarding meal pattern of college going students

5.7 Information regarding meals taken outside home by the college going students

5.8 Food frequency of the college going students

5.9 Food intake of college going students

5.10 Adequacy of food intake by college going students

5.11 Nutrient intake of college going students

5.12 Adequacy of nutrient intake by college going students

5.13 Diet diversity score of college going students

5.14 Anthropometric measurements of college going students

5.15 Prevalence of underweight, overweight and obesity among college going students

5.1 Background information of college going students

Number of boys and girls were equal from both the government and private colleges. Majority of the respondents were in the age group of 18-21 years. Most of the respondents from both the colleges were daily commuters as they were coming from nearby villages and metropolitan areas. More respondents from private colleges had private schooling while government college respondents mostly had government schooling and both the colleges were degree colleges. Most of the students from both the colleges belonged to rural area and general category. From both the colleges, most of the respondents were Hindus and liberally religious. Nuclear family and medium family size were more prominent among the respondents from both the colleges. Majority of the respondents from government colleges had a family income below Rs.10, 000/month while in private college, studentsô family income between Rs.30-60, 000/month was prominent. According to parents educational level, more number of private college respondentsô fathers were graduates, mothers were educated upto intermediate; while majority of government college respondentsô fathers were educated upto intermediate level and mothers had studied uptill primary level, respectively. Higher number of government and private college respondentsô fathers were in service by occupation

and mothers were engaged in household work. Parentsô health, as in respondentsô opinion was fit in case of respondents from both the colleges. Higher percentage of respondents from both the colleges had one to two siblings. Majority of the respondents from both the colleges were vegetarian, may be because most of them were Hindus and were taking dinner, lunch and breakfast daily.

5.2 Information regarding mass media interaction

A higher percentage of respondents were watching television daily for 1 hour followed by those who were watching it for 2-3 hours as they spent half of their day in college and then in various other activities e.g. sports etc. More respondents were using mobile phones for more than 3 hours daily as they used it for internet surfing, social networking and playing games. Among girls and boys, more girls watched television for 2-3 hours daily as compared to boys as girls spent most of their time at home after college while more boys were using mobile phones (>3 hrs) and internet for playing games and messaging (2-3 hours) daily, while girls were spending less time on these activities. It was found that majority of the respondents from both the private and government colleges used mobile phones for more than 3 hours daily. The present findings are in agreement with those of Henry (2004) who also reported that the amount of time children spent with different sources of media from: television, film, video games, and computer or online media was exceedingly taking up the greater part of their time. With the average five and a half hours children spent using media on a daily basis, the only thing they spent more time doing was sleeping. Fleming-Morn and Thiagarajah (2005) observed that when other variables are controlled, TV exposure independently increased the odds of becoming overweight by 50 per cent for both men and women. Perton (2005) noted that three of every four adolescentôs ages 15 to 17 and 40 percent of youth ages 12 to 14 carried their own cell phone. Roberts *et al.* (2005) explained that among school-age youth (ages 8 to 18), 74 percent lived in a home where the computer had an internet connection, and 60 percent had access to an instant messaging program and they spent an average of six hours per day using media, and they often used more than one medium at a time.

5.3 Programs preferred to be watched on television or internet by college going students

It was seen that most of the respondents were rarely watching movies, music videos and news followed by those who watched it very often. They might not have got time to watch movies due to long college hours or lack of interest. Almost equal percentages of girls and boys watched movies and music videos very often. More girls preferred watching daily soaps than boys who were watching sports/athletics programs more than girls due their varied interests. Girls are generally interested in family oriented daily TV soaps. More respondents from private college watched movies, music videos and news very often as compared to

government college respondents, may be because of more access of private college going students to multiplexes. A higher percentage of respondents from private college preferred daily soaps very oftenly than respondents from government college. May be due to more access to TV in their homes. Tiggeman and Pickering (1996) reported that the type of exposure, not the amount, is correlated with negative body image. Specifically, rates of exposure to soap operas, movies, and music videos were associated with higher rates of body dissatisfaction and drive for thinness.

5.4 Information on respondents' lifestyle and eating habits

Data indicated that that most of the respondents were satisfied with their body physique/figure and wanted no changes in their body weight while 35.5 and 24.5 per cent of the total respondents wanted to gain weight and lose weight, respectively. In private college, more respondents wanted to lose weight and gain weight than respondents from government college as they had more exposure to TV and watched movies and music videos more often than those from Govt. college (Table 4.11); a higher percentage from government college wanted no changes in body figure as compared to those in private college. More number of girls wanted to lose weight than boys may be because of the influence of media, self image and friends. These findings are corroborated by those of O'Dea *et al*. (1996) who studied the food habit, weight control behaviours and body image of young adolescents of 11-14 years old in Australia. They found that female on an average used 4.0 weight-loss methods as compared to 2.0 for male, but there was no difference between the mean numbers of extreme weight-loss methods. They further noted that 16.2 per cent of female and 6.9 per cent of male participants used at least one extreme weight-loss method.

A higher percentage of the college going students thought that TV models have a perfect body physique/figure. A higher percentage of the respondents from government college than those from private college and more number of boys than girls thought that TV models have a perfect body physique/figure. As boys are more engaged in exercise and sports activities, therefore wanted to achieve a physique like a model. Duggan and McCreary (2004) noted that gay and straight men alike are shelling out significant sums of money for gym memberships, styling products, salon haircuts, manicures, and waxing treatments now a days. Most of the respondents did not feel motivated to lose weight by watching TV models and more number of respondents from private college wanted to attain a body figure like fashion model than those from government college who wanted to be like their friends in body physique might be because of media exposure and concept of self-esteem among adolescents. No doubt that media as per Duggan and McCreary (2004) influenced people to copy role models but in the present study, not much influence was noticed on college going students by assessing their lifestyle and food habits.

Thirty three per cent of the respondents skipped meals after watching/ reading a fashion programme/article/magazine because they wanted to lose weight and achieve a physique/figure like a model or any of their friends. These findings are in line with those of Story and Stang (2005) who also explained that meal skipping is common among adolescents, especially during middle and late adolescence. Breakfast is the most commonly skipped meal and is attributed to lack of time, desire to sleep longer in the morning, lack of appetite, and dieting to lose weight. More girls (38%) than boys (28%) skipped meals after watching/ reading a fashion programme/article/magazine as more girls wished to lose weight. Similar pattern was seen by Gleason and Suitor (2001) who noticed that the percentage of youth skipping breakfast increases with age, especially for females. Among adolescents (14-18 years), 34 per cent of girls and 28 per cent of boys ate nothing for breakfast compared to only 15 per cent among boys and girls of 9-13 years. Majority of the students never considered self induced vomiting to lose weight while only 22 per cent tried it and they got this idea from media, friends, family and all of them. Neumark-Sztainer (2002) in a population-based study of nearly 5,000 teens, also reported that more than half of teen girls and one-third of boys use unhealthy weight control behaviours such as fasting, vomiting, laxatives, skipping meals, or smoking to control their eating/appetites. Notably, higher weight and overweight teens engage in both binge-eating and unhealthy weight control more often than normal weight teens. In fact, 20 per cent of overweight girls and 6 per cent of overweight boys engage in using laxatives, vomiting, diuretics, and diet pills. Respondents from government as well as from private college; both girls and boys tried dieting to lose weight because of an article in a magazine/TV program due to impact of media and concept of self image, but media affected only a small per cent of respondents. This finding is in agreement with that of Kann *et al*. (2000) who also found that dieting is a common and widespread practice among adolescents, especially girls. In 1999, 59 per cent of high school girls and 26 per cent of high school boys reported trying to lose weight during the 30 days preceding a national survey. Almost 20 per cent of girls had gone without eating for 24 hours or more to lose weight, 11 per cent had taken diet pills, and 8 per cent had vomited or taken laxatives.

A higher percentage (47.5%) of respondents sometimes tried new food products after watching advertisements. Almost equal percentage of respondents from government (23%) and private colleges (24%); more girls (28%) than boys (19%) tried new food products after watching advertisements which may be because of the attractive appearance and appeal of the product and curiosity to try new food products. Such findings have been reported earlier by Peregrin (2001) who examined that children heavily influenced by the media have the ability to manipulate how money is spent and savvy companies see them as the consumers to be targeted. Children sometimes even spend their own money on the products they see repeatedly reinforced around them. Advertisers use this well known fact to target children

because they know the powerful influence children can have on their parents purchasing decisions. Similarly, Borzekowski and Robinson (2001) also reported that most food advertised is high in fat, sugar, and salt leading to children in the grocery store begging their parents for candy and unhealthy snack foods. Foods advertised taste ñgoodò resulting in advertisements publicizing foods with high amounts of sugar, fat, and salt towards younger generations. Majority of the respondents (59.5%) felt that the presence of a particular fashion/film model/figure in advertisement affects consumption of the advertised food/drink which may be due to popularity of these public figues and celebrities among youth whom they worship as role model. Previous researchers have also (Murnen *et al*., 2003) suggested that media objectified female and male bodies. Such objectified body shapes promoted ñthin-idealò in women and muscularity in men. Gantz *et al.* (2007) also proposed that common marketing techniques used in television commercials include repetition, celebrity endorsements, eye-catching spokes-characters, familiar fictional characters, sweepstakes and premiums. Depending on their age, youth view between 12 and 21 commercials for food or beverages every day.

Snacking while watching TV, working on net, reading leisurely, all of them and none of them were seen in 45, 7, 5.5, 21 and 21.5 per cent of the respondents, respectively because of eating out to lessen boredom or for getting enjoyment or to have quick, convenient snacks, a replacement of regular meal while feeling hungry to avoid missing any of the TV show. From government college, higher percentage of the respondents (49%) took snacks while watching TV than private college (41%). More girls (50%) than boys were taking snacks while watching TV might be to relieve stress and anxiety. The prevalence of snacking and proportion of calories and nutrients from foods consumed as snacks has risen during the period from 1977 to 1996 (Jahns *et al.*, 2001). Such findings are in line with those of Kaur *et al*. (2009) who noticed that sixty seven (56%) adolescents consumed such snacks sometimes while watching Television and 42 per cent subjects consumed fruit juice. Snacks account for 25-33% of daily energy intakes among adolescents. Most of the respondents (38%) sometimes ate without hunger followed by 32.5 per cent who never did this and almost equal percentage ate without hunger very oftenly and rarely. More girls (18%) very oftenly ate without hunger as compared to 12 per cent boys while more boys (51%) sometimes ate without hunger as compared to the girls (25%). Eating in the absence of hunger was also reported by Shomaker *et al*. (2010).

5.5 Foods preferred by students in college canteen

Samosa/bread pakora, fresh juice and tea/coffee were the foods taken very oftenly by the respondents followed by potato chips, cold drinks, burger, noodles and patties which were preferred sometimes. More respondents from private college preferred *samosa/bread pakora* very oftenly as compared to the respondents from government college. Many factors

including availability, cost, taste etc. affect the food choice and might have been the factors responsible for preference of students for such foods. Funke and Ajayi (2007) investigated the determinants of food choices of adolescents (10-19 years) in order to assess their nutritional knowledge and implication and it was concluded that, the food choice of the adolescents in the study area was based more on taste preference than the nutritional contents. Almost equal percentage of girls (39%) and boys (40%) were eating *samosa/bread pakora* very oftenly while more boys (39%) than girls (26%) preferred cold drinks. The results were in agreement with Wardle *et al.* (2004) who proposed that men consumed less high fibre foods, less low fat foods and more soft-drinks than women. Similarly Forshee *et al*. (2006) showed that adolescents drink more full-calorie soda per day than milk. Males aged 12ï 19 years drank an average of 22 ounces of full-calorie soda per day, more than twice their intake of fluid milk (10 ounces), and females drank an average of 14 ounces of full-calorie soda and only 6 ounces of fluid milk.

5.6 Information regarding meal pattern of college going students

A higher percentage of respondents (49.5%) took one meal outside home daily; 17.5 per cent took two meals outside the home and only 7 per cent of them took three meals outside home on daily basis. This is because of the fact that eating lunch at college canteen was their compulsion as they did not carry the lunch tiffin. Moreover outside home, teens spend less time with family and more time with friend and eating foods with friends is a source of enjoyment for them. Story and Stang (2005) examined that as teens become more independent, eating away from home increases. One-third of all teen eating occasions occur outside the home. Over half (52%) of out-of-home eating occasions take place at school, followed by fast food restaurants (16%), other locations (16%), and vending machines (6%). The average teen eats at a fast food restaurant twice a week. Fast food visits account for 31 per cent of all food eaten away from home, and make up 83 per cent of adolescent visits to restaurants.

5.7 Information regarding meals taken outside home by the college going students

According to majority of the respondents, only 29.5 and 37 per cent respondents mostly included fruits/vegetables/juices and soft drinks/fast food in meals taken outside home by them, respectively. Similar pattern was found when college-wise and sex-wise comparison of meals taken outside home was carried out. Again availability of food items, their taste, feeling of satiety and cost has influence on their acceptability to human palate. French *et al*. (2001) investigated that frequency of fast food restaurant use (FFFRU) was positively associated with intake of total energy, percent energy from fat, daily servings of soft drinks, cheeseburgers, French fries and pizza, and was inversely associated with daily servings of fruit, vegetables and milk. FFFRU was positively associated with student employment, television viewing, home availability of unhealthy foods, and perceived barriers to healthy

eating, and was inversely associated with studentsô own and perceived maternal and peer concerns about healthy eating. FFFRU was not associated with overweight status.

More respondents (39%) from private college took soft drinks/fast foods most of the times outside home than fruits/vegetables/juices (23%) while almost equal percentage of respondents from private college mostly included fruits/vegetables/juices (36%) and soft drinks/fast foods (35%) in meals taken outside home by them. It might be due to difficult food choices, availability and knowledge about nutrient composition of various foods. Neumark-Sztainer *et al*. (2003) found that a significantly higher proportion of adolescents living in the metropolitan area reported living near a fast food outlet compared to those living in the non-metropolitan area. Whilst evidence about the effect of availability and accessibility on the consumption of fast foods is scare, there is limited evidence that one or both of these factors may influence the intake of high fat snacks, soft drinks and fruit and vegetable consumption among adolescents.

5.8 Food frequency of the college going students

Milk was taken by 61 per cent of the respondents. Curd, tea, fruits, fruit *chat*/salad, breakfast cereals, fresh juice, soft drinks, pulses and *chapatti* were taken once daily by 30-50 per cent of the respondents. In government college, students consumed milk (58%), curd (46%), milk and other shakes (28%), breakfast cereals (34%), vegetables (71%), green leafy vegetables (37%), other vegetables (85%), potato vegetable (69%), rice (27%) and pulses (50%) once daily. Similar trend was found in private college. Food frequency is mainly influenced by availability, accessibility of foods and their taste. Savige *et al*. (2007) conducted a cross-sectional online food survey administered through schools on 3841 secondary students and found that two-thirds of participants failed to consume foods from the five recommended food groups daily; over a third reported eating fruit órarely or neverô; and 22 per cent reported eating fast foods every day. Food intakes were generally more in line with dietary guidelines among girls than boys. A study conducted by Turin *et al*. (2007) on 396 school going children (6-13Y) residing in slums of different parts of Dhaka Metropolitan city also reported that 77.8 per cent of the children got three meals per day but inadequate in amount. In most of the cases the common foods were rice, lentil, potato and green leafy vegetables. Those children from families with lower incomes and less educated parents had a dietary pattern which tended to be poor regarding egg, milk, meat and fruit. Sex-wise comparison of food frequency highlighted that foods which were taken once daily by most of the girls were curd (41%), milk and other shakes (34%), tea (40%), fresh juice (36%), breakfast cereals (43%), fruits (49%), vegetables (80%), other vegetables (78%), potato - as vegetable (70%), rice (30%), pulses (53%) and chocolates (27%). Similar trend in food frequency was found in case of boys. Number of girls who consumed milk (68%), fruit salad/*chat* (48%) and green leafy vegetables (39%) once daily were more than the boys (milk-

54%,fruit salad- 33% and GLVôs-26%). On the other hand, more boys were taking cold drinks (36%) than girls (28%) once daily. These results are in agreement with those conducted at Centre for Public Health (2003) on Australian men it was found that men consume less fruits and vegetables than women and compared to other groups, men aged 18-44 years also ate a smaller variety of vegetables. Wardle *et al*. (2004) also noticed that men consumed less high fibre foods, less low fat foods and more soft-drinks than women.

Foods taken in 2-3 times daily category mostly included- *chapatti* (57%) followed by vegetables (22.5%), milk (18.5%), tea (10.5%) and fruits (7.5%) in descending order. While comparing college-wise, it was found that more respondents from private college consumed milk (22%) and *chapatti* (63%) 2-3 times daily as compared to 15 per cent and 51 per cent respondents from government college, respectively, may be because of better economic status of private college respondents (Table 4.24) and *chapatti* being the staple food included in all meals every day. These findings are in line with those of Kaur *et al.* (2009) who revealed that one third of subjects (62%) consumed three meals per day. Regarding consumption of chapattis/day, forty eight (40%) adolescents consumed 4-6 *chapattis*. Forty eight (40%) adolescents consumed biscuit in between the meals. Half of the subjects consumed snacks once in between the meals and also after lunch. Dapi *et al.* (2005) conducted a study on 52 school going students and found similar results that milk products (sweet milk, powdered milk, yoghurt),vegetables/green leaves, cereals, meat/fish/eggs (beef, chicken, pork, goat, fish) and junk food were significantly more often consumed by urban than by rural adolescents.

Percentage of respondents who consumed fast foods once weekly were (21%) chips/fries, (21%) pasta/noodles, (20%) macaroni, (14%) pizza, (23.5%) burger, (29.5%) *samosa*, (25.5%) *bread pakora*, (17.5%) *patties*, (24%) ice cream and (14.5%) pastries. Coffee-hot cold (30.5%), RTS juice (40.5%), toppings such as jam (42%), cheese (51%), cheese spreads (63.5%), meat and fish products (79%), butter (37%), peanut butter (69.5%), mayonnaise (73.3%) and fruit cream (52%), *dosa* (27.5%), *idli* (39.5%), pasta/noodles (26%), macaroni (41%), porridge (52%), pizza (34%), burger (32.5%), uttapam (54%), sandwiches/toast (35.5%), patties (34.5%), fish and fish products (89.5%), meat and poultry (82%), eggs (74%), alcoholic beverages (91%) were the foods that were never consumed by majority of the respondents. It may be because some of these foods were not so popular and most of the respondents were vegetarians.

5.9 Food intake of college going students

Results revealed that mean daily intake of college going girls and boys (17-21Y) was significantly ($p<0.05$) higher than their respective RDIs. Cereals are the cheapest and widely available source of energy and several other nutrients. Results were in line with those reported by Venkaiah *et al*. (2002) in a study on adolescents in the rural areas of States of Andhra

Pradesh, Gujrat, Kerela, Maharashtra, Uttar Pradesh, Tamil Nadu of India. It was also reported that consumption of cereals was higher in boys as compared to the girls, daily mean intake of cereals among government college students was significantly ($p<0.05$) higher than their private college counter parts, which may be due to food habits, food preferences, choices, food availability and family income etc.

Mean intake of pulses of college going girls (17-18 Y) was less whereas of boys was more than RDI. In contrast, Venkaiah *et al.* (2002) found higher intakes of pulses than RDI among boys and girls both. In contrast to this, in ad study conducted by Gupta *et al.* (2010), it was reported that the consumption of pulses among boys and girls (16-18Y) was non-significantly lower than their respective RDIs. Arlappa *et al*. (2010) also reported lower intakes of pulses. The daily mean intake of pulses of girls and boys of 18-21 years of age was 110.3 and 107 per cent of RDI, respectively; more girls than boys consumed pulses once daily and 2-3 times daily (Table 4.23), Gupta *et al*. (2010) also found that in the boys of 19-25 year age the consumption of pulses was significantly lower than the RDI and in the girls of the same age group, the pulse intake was non-significantly lower.

In the present study, the daily mean intake of root and tubers of college going girls (17-18Y) was significantly ($p<0.05$) lower than the RDI. On the other hand, boys were consuming more amounts of roots and tubers than the RDI. Roots and tubers mostly included in their diets were potato and onion (Table 4.23). But in a study conducted by Rao *et al*. (2006), the consumption of roots and tubers among girls (16-18Y) was little higher than the boys of the same age group. The daily mean intake of root and tubers of college going girls of 18-21 years was almost half of the RDI and in boys of the same age group, mean daily intake was 69.7 per cent of the RDI. In contrast, Gupta *et al*. (2010) noticed the consumption of roots and tubers among boys and girls of 19-25 years to be higher than their respective RDIs.

Results of the present study revealed that the mean intake of other vegetables among girls and boys (17-21Y) was significantly lower than their respective RDIs which may be due to variation in their availability and food choices. The results are in line with those found by Venkaiah *et al*. (2002). But these findings were not in agreement with those of Gupta *et al*. (2010) who found significantly higher intakes of other vegetables among boys and non-significantly higher intakes of other vegetables in girls (16-25Y).

Mean daily intake of green leafy vegetables of the girls and boys of 17-18 years was 53.6 per cent and 72.2 per cent of RDI, respectively and the difference was significant. This may be because of the seasonal unavailability of green leafy vegetables as the data collection for the research was done in the month of April. Similar trends were noticed by Venkaiah *et al.* (2002). The results of the present study are also in agreement with those reported by Rao *et al*. (2006). The intake of green leafy vegetables of the college going girls and boys (18-21Y) was (17.3% of RDI) significantly ($p<0.05$) lower than the RDI.

In the present study, the mean daily intake of milk and milk products was significantly ($p<0.05$) higher among both girls and boys (17-21Y) which is reflected in food frequency also. They took milk and milk products in the form of milk, curd, tea, coffee, milk and other shakes and butter. Gupta *et al*. (2010) also reported significantly higher intakes of milk and milk products among boys and girls of similar age. Savige *et al*. (2007) on the other hand, reported lower intake of milk and milk products in adolescents.

Girls and boys (17-21Y) in the present study consumed higher amounts of fats and oils than the RDI which is also indicated in food frequency (Table 4.23). Present findings corroborate to that of other finding reported by earlier workers (Gupta *et al*., 2010). In contrast, Rao *et al*. (2006) observed consumption of fats and oils to be low among girls and boys.

Average consumption of sugar and jaggery was significantly lower than RDI among girls and boys (17-18Y). These findings are in agreement with those of Venkaiah *et al*. (2002) who also noted lower intakes of sugar and jaggery among girls and boys (16-18 years). The mean intakes of sugar and jaggery of both boys and girls (18-21Y) were higher than their respective RDIs. Again, these findings are in agreement with those of Gupta *et al*. (2010) who noticed higher intakes of sugar/sweets among girls and boys (17-21Y).

Mean daily intake of fruits in girls and boys (17-21 years) was significantly ($p<0.05$) higher than their respective RDIs, maybe due to easy availability and affordability. These findings were consistent with those reported by Venkaiah *et al*. (2002). But in a study conducted on Australian men it was found that men consumed less fruits and vegetables than women and compared to other groups, men aged 18-44 years also eat a smaller variety of vegetables (Centre for Public Health 2003). In contrast to it, Ansari *et al.* (2012) reported a lower consumption of fruits among a total of 2402 first year undergraduate students from one university in each of the countries of Germany, Denmark, Poland and Bulgaria.

5.10 Adequacy of food intake by college going students

Adequacy of food intake revealed that intake of majority of girls and boys (17-18Y) consumed adequate amounts of cereals while boys and girls from 18-21 years age had marginally adequate and marginally inadequate intakes of cereals, respectively. Kulsum *et al*. (2008) observed adequate intake of cereals in adolescents. Intake of pulses was marginally adequate among boys (17-18Y) and marginally inadequate in girls of similar age group while the boys and girls of 18-21 years had adequate and marginally adequate amounts of pulses, respectively. It may be due to the fact that pulse consumption was less in their diets, which again depended on the food choices and availability. Kaur and Kaur (2011) also found less than 50 per cent and 51.67 per cent adequacy of pulses in girls and boys, respectively. Consumption of roots and tubers was marginally adequate and marginally inadequate in boys and girls of 17-18 years age, respectively. For the boys and girls belonging to 18-21 years age

group, intakes of roots and tubers were below 50 per cent of RDI and marginally adequate, respectively. In contrast, 100 per cent adequacy was observed by Kulsum *et al*. (2008) for roots and tubers. Green leafy vegetable intake was marginally inadequate and inadequate in majority of girls and boys (17-21Y), may be due to less availability of them at the time of diet survey. In contrast, almost equal percentage of boys and girls i.e. 40 and 39 per cent had adequate intakes of green leafy vegetables as found by Shafi *et al*. (2009). Boys (17-18Y) were taking marginally inadequate amount of other vegetables while boys of 18-21 years were taking inadequate amounts. On the other hand, girls (17-21Y) took inadequate amounts of other vegetables. These findings are in line with those of Kaur and Kaur (2011) who reported inadequate intakes of other vegetables in adolescents. Majority of the boys and girls (17-18Y) took adequate and marginally adequate amount of fruits. But in 18-21 years, both boys and girls took fruits between 75 to 99.9 per cent of RDI. Shafi *et al*. (2009) reported that 59 per cent of boys and 56 per cent of girls had adequate fruit consumption. In contrast, Story and Stang (2005) observed inadequate intake of fruits by adolescent girls and boys. The intake of milk and milk products was marginally adequate and inadequate among boys and girls of 17-18 years, respectively. For the girls and boys of 18-21 years, milk and milk products consumption was marginally adequate and adequate, respectively. It may be due to more liking and easy availability of milk in Haryana. Similar findings have been reported by Kuslum *et al*. (2008) who noticed consumption of milk and milk products to be 100 per cent of RDI in adolescents. Marginally adequate and inadequate intakes of fats and oils were found in boys and girls of 17-18 years while those belonging to 18-21 years age group had adequate and marginally adequate amounts, respectively. Consumption of sugar and jaggery were marginally inadequate and inadequate in boys and girls (17-21Y). On the other hand, adequate consumption of fats and oils and sugar and jaggery was observed by Kaur and Kaur (2011).

55.11 Nutrient intake of college going students

Findings of the present study revealed that intakes of energy, protein and iron of both boys and girls (17-21Y) were less than RDA as they were consuming lower amount of cereals, roots and tubers, pulses, green leafy vegetables, and other iron rich food items. Consumption of meat, poultry and eggs was negligible. The results of the present study are in agreement with those of Sanwalka *et al*. (2010) who reported lower energy intakes among adolescent girls and boys. Similar results were observed by Gupta *et al*. (2010) too. They also observed that iron intake was significantly lower in girls and boys where girls consumed much less iron than boys of the same age. Venkaiah *et al*. (2002) also observed that intake of protein was lower than the RDA in both girls and boys. On the other hand, Sjo¨berg *et al*. (2003) observed higher protein consumption in adolescents. According to them fat consumption of boys and girls (17-21Y) was higher than the RDA due to higher consumption

of visible fat in their diets. The findings are in agreement with those of French *et al.* (2001) who reported higher consumption of fat in adolescent males and females. In contrast, fat intake was significantly lower in adolescent girls according to a study done by Parimalavalli and Sangeetha (2011). In the present study, calcium intake was higher than the RDA among both boys and girls (17-21Y). This was because of higher consumption of milk and milk products which has also been depicted in food frequency (Table 4.23).The results were in line with those reported by French *et al*. (2001). But it was reported by Venkaiah *et al*. (2002) that calcium intake was lower than the RDA in adolescents.

Girls had lower intakes of folic acid (17-21Y) and riboflavin (18-21Y) while boys of both the age groups (17-21Y) had lower intakes of riboflavin which may be due to poor consumption of green leafy vegetables and no intake of meat, poultry and eggs. The findings of the present study coincide with those reported by Gupta *et al*. (2010) i.e. lower intakes of folic acid by adolescents. On the other hand, McNulty *et al*. (1996) in a study reported that folic acid consumption was nearly equal to RDA in school going girls and boys. Malhotra and Passi (2007) also found lower intake of riboflavin in girls of 16-18 years and above 18 years. On the other hand, Venkiah *et al*. (2002) reported riboflavin intake to be higher among girls than boys. Riboflavin intakes of government and private college students were almost equal. Vitamin C intake was more than the RDA in boys as compared to girls of 17-21 years who had lower intakes as boys consumed higher amounts of fruits than those of girls. The results are in line with those of Parimalavalli and Sangeetha (2011) who reported lower intake of vitamin C in adolescent girls. It was revealed that intakes of retinol and thiamine were upto the mark in both girls and boys (17-21Y) because of higher consumption of milk and products. The results are in agreement with those reported by Venkiah *et al*. (2002) in a study conducted on adolescents. French *et al.* (2001) also observed higher intakes of retinol and vitamin C in adolescents.

5.12 Adequacy of nutrient intake by college going students

In the present study, it was found that energy intake by majority of the boys and girls (17-21Y) were marginally adequate. Most of the boys (17-21Y) had adequate protein intake while it was marginally adequate for girls of the similar age. In contrast, Kulsum *et al*. (2008) reported that a higher proportion of children (58%) were not receiving sufficient protein and calories; the adequacy for both was found in a lesser proportion of children (17%) while 25 per cent had adequate protein but insufficient calories. Marginally adequate and inadequate fat intake was found in boys and girls of 17-18 years while in the boys and girls of 18-21 years, fat intake was adequate and marginally adequate, respectively. Calcium intake was adequately met in majority of the girls and boys (17-21Y) because of higher consumption of milk and milk products which has also been shown in food frequency (Table 4.23). Marginally inadequate iron intake was observed in girls (17-18Y) and boys (18-21Y) while

inadequate amount of iron was taken by girls (18-21Y) and boys (17-18Y) due to lower consumption of green leafy vegetables and negligible intakes of meat and poultry. Similarly, intake of various nutrients expressed as per cent of RDA by Rao *et al*. (2006) revealed that more than 50 per cent of boys and girls had intakes of less than 70% of RDI. The proportion was higher with regard to iron (96% for boys and 90% for girls), followed by riboflavin (88% for boys and 80% for girls) and vitamin-A (78% each for boys and girls). Significant gender differentials were observed with regard to the intake of energy, iron, thiamine, riboflavin and niacin, with higher proportion of boys consuming less than 70 per cent of RDI. Majority of boys (17-21Y) consumed retinol adequately while marginally inadequate and adequate amounts of retinol were found in girls of 17-18 years and 18-21 years, respectively; may be due to higher consumption of milk and milk products by boys. Half of the boys and girls (17-21Y) were taking folic acid inadequately and marginally adequately, respectively which may be again because of lower intakes of green leafy vegetables in their diets. Adequate amount of thiamine was consumed by girls and boys (17-21Y) except for boys of 18-21 years who had marginally inadequate thiamine intakes. Riboflavin intake was marginally adequate in girls and boys (17-21Y) except for girls of 17-18 years who were consuming adequate amounts. Majority of the respondents (17-21Y) had adequate intake of vitamin C, may be due to higher consumption of fruits. The findings of the present study are in agreement with those of Malhotra and Passi (2007) who noticed that majority of the subjects had adequate or fairly adequate NAR (Ó 0.66) with respect to protein (83.7%), calcium (94.7%), thiamine (98.1%), riboflavin (60.8%), niacin (87.1%) and vitamin C (56.9%); only a small number had adequate/fairly adequate intake with respect to vitamin A (26.8%), folic acid (15.8%) and iron (15.3%).

5.13 Diet diversity score of college going students

5.13.1 Frequency of the college going students as per DDS

From a total of 60 students, majority of the students (46.6%) consumed six food groups, 35 per cent had five food groups, 11.6 per cent took seven food groups and equal percentage (3.3%) of students had eight and four food groups out of total of 13 food groups. Foote *et al.* (2004) also found that on an average, the participants reported only 7ï 8 different commodities in a day.

5.13.2 Percentage of students consuming different food groups by DDS

Diets continued to diversify as scores increases. The higher the dietary diversity score, the greater the variety shown (Mirmiran *et al*., 2004). All of the students consumed items from the four food groupsô viz. starchy staples, all other fruits and vegetables and vitamin-C rich fruits because these foods are less expensive. With the increasing DDS, the consumption percentage of all legumes and nuts and dairy products increased. This might be because of increasing income. The consumption of vitamin A-rich dark green leafy

vegetables, vitamin A-rich deep yellow, orange and red vegetables and vitamin C-rich vegetables was restricted to higher DDS (8) which may be due to seasonal unavailability of these food groups. The findings are similar to those of Arends (2008) who also reported that all the children consumed food items from the food groupsô viz. starchy staples, legumes and nuts and other fruits and vegetables.

5.13.3 Mean DDS of respondents

The mean DDS of respondents was 5.75. The results were almost similar to those reported by Mirmiran *et al.* (2004) in a study where mean dietary diversity score was 6.25 ± 1.08 (range 0-10). College-wise and sex-wise comparison showed that DDS of government and private college students was almost equal and the differences were non-significant. The respondents were not taking foods from vitamin A-rich dark green leafy vegetables, vitamin A-rich deep yellow, orange and red vegetables, vitamin C-rich vegetables and flesh foods food group and therefore DDS was not high. Similar findings has been reported by Mirmiran *et al.* (2004), that after dividing DDS into three groups, 61.4, 38.3 and 3% of individuals had DDS Ó6, 3-5 and <3, respectively.

5.13.4 Percentage of respondents who consumed different food groups

Results revealed that no one consumed organ meat, small fish eaten whole with bones and all other flesh foods and only 1.6 per cent had miscellaneous small animal protein as majority of the respondents were vegetarian. Majority of the students (98.3%) consumed dairy products. All legumes and nuts were consumed by 81.6 per cent of the respondents. Bezerra and Sichieri (2011) also reported similar findings regarding consumption of cereals, pulses, other vegetables and milk. Vitamin C-rich vegetables, vitamin C-rich dark green leafy vegetables, vitamin A-rich deep yellow, orange and red vegetables, vitamin A-rich fruits and eggs were taken by 46.6, 21.6, 15, 3.3 and 5 per cent of the students, respectively.

5.13.5 Mean DDS by family income category

The respondents with the highest DDS (6.1) had a family income between Rs.10-30,000/month. As the income decreased, DDS also decreased (5.8 and 5.7) and it was interesting to know that as the income increased, instead of increasing, DDS again decreased (5.0 and 5.5) potentially may be because of consuming more fast foods or skipping of meals by respondents belonging from higher income group.

5.14 Anthropometric measurements of college going students

Anthropometric measurements i.e. height and weight of the respondents of the present study were almost similar to the height and weight of adolescents as reported by Goyal *et al.* (2010). Al-Rewashdeh and Al-Dmoor (2010) also reported similar range of height, weight and waist circumference. Similar results were found by Snehlatha *et al.* (2003) for waist circumference and waist-to-hip ratio as found in the present study.

5.15 Prevalence of underweight, overweight and obesity among college going students

5.15.1 BMI

Results revealed that 2 per cent girls and 14 per cent boys suffered from severe form of chronic energy deficiency while more girls (13%) as compared to boys (5%) suffered from moderate form of chronic energy deficiency. There were 14 per cent girls and 27 per cent boys who were suffering from mild form of chronic energy deficiency as the intakes of cereals, roots and tubers, other vegetables, fats and oils and sugar and jaggery were lower among the respondents. The findings of the present study were in line with those of Sharma and Hardikar (2010) who also reported that 28 girls were normal in nutritional status; 19 were normal but under weight status; 13 and 9 belonged to CED I and II grade, respectively; 3 per cent were chronically energy deficit. Rest of the 3 per cent were overweight.It was found that 27 per cent girls and 25 per cent boys had low to normal weight while 33 per cent girls and 25 per cent boys had normal weight. Snehlatha *et al.* (2003) also reported similar results that majority of the men and women had normal BMI. In the overweight category, there were only 9 per cent girls and 4 per cent boys while only 2 per cent girls were found to be obese as the consumption of fats and oils, sugar and jaggery and fast foods of respondents were not high. Sakamaki et al. (2005) also reported that 80.5% of young Japanese female students had a normal BMI and 16.6% of the students were underweight with the prevalence of BMI>30 obesity being very low in this study sample. Female students had a greater desire to be thinner (62.0%) than males (47.4%).

5.15.2 Body fat per cent

It was highlighted that 54 per cent girls and 65 per cent boys had normal values of body fat per cent and thus, normal weight as the intakes of energy, protein, visible fat were lower than the RDA and the BMI of majority of the respondents were in normal range. There were 14 per cent girls and 13 per cent boys who were overweight. Obesity was prevalent among girls (32%) and boys (22%). In contrast to this, Kim *et al.* (2012) reported that 74.1 per cent and 41.8 per cent men had a percentage body fat value greater than the first and second cutoffs, respectively; for women, 46.2 per cent and 15.9 per cent had a percentage body fat value greater than the first and second cutoffs, respectively.

CHAPTER-VI

SUMMARY AND CONCLUSIONS

The ónutrition transitionô a term used to describe shifts in diet, physical activity, health and nutrition can be traced to higher incomes, the influence of mass media and food marketing, and a range of changes in the nature of work and leisure (Popkin, 2000). Globalization processes are perceived to play a role in nutrition: the growth of transnational food companies (TFCs); the development of transnational supermarkets; liberalization of foreign direct investment and global food advertising and promotion. Expenditure on food advertising is high and increasing in developing countries; a significant proportion of this advertising is for energy-dense processed foods targeted at children and youth. The objective of this advertising is to encourage greater consumption of processed foods (WHO, 2007) which can lead to overweight and obesity, hence physical inactivity and poor health. This creates an endless cycle that perpetuates from generation to generation and needs to be checked well in time. Therefore, there is a need to study the impact of mass media on nutrition transition taking place in India also over the last few years especially among children and youth and thus keeping it in mind the present study has been planned with following objectives:

3. To study the impact of socioeconomic status and mass media exposure on eating habits, eating disorders, dietary patterns and dietary diversity scores of college going youth (18-21Y).
4. To assess nutritional status of college going youth (18-21Y).

Materials and Methods

The present study was conducted on college going students (18-21yrs) in a metropolitan city, Gurgaon from eastern zone of Haryana state purposively. Total 200 normal healthy students, 100 each from Govt. college and Private college were selected on the basis of their consent and medical fitness. A pretested pre-structured questionnaire schedule was developed to collect data regarding family background (family type, parentôs education, family occupation, family income, disease history etc.), exposure to mass media (print as well as electronic) ,eating habits, food frequency and food disorders, diet diversity scores, anthropometric measurements and dietary intake (24-hour recall method) by interview method.

Major Findings

The number of boys and girls were equal and most of them were daily commuters. Results showed that most of the private college students had private schooling while government college respondents had government schooling. Almost all of them (97.5%) were Hindus belonging to general category (57.5%) and were liberal religiously (63.5%). Majority

(57%) of them were from nuclear family with medium family size (73%) and having one to two siblings (73.5%). The family income of most of private college respondents (26%) was Rs.30-60, 000/month while it was below Rs.10, 000/month for government college students (48%). In private college, 40 per cent of the respondentsô fathers were graduates while in government college, 34 per cent of the respondentsô fathers were intermediates; 23 and 29 per cent of respondentsô mothers were educated upto intermediate (private college) and primary (govt. college) level, respectively. Both mothers and fathers were fit as per respondents. Majority (74%) of the respondents from both the colleges were vegetarian.

Majority of the respondents watched TV for one hour (34%), used mobile phones for more than 3 hours (58%) and were reading newspaper for 1 hour (48.5%) daily. More number of girls (35%) watched TV for 2-3 hours as compared to boys (33%) while more boys used mobile phones (65%) and internet (5%) for more than 3 hours daily as compared to girls. College-wise, more respondents from government college (21%) were watching TV for more than 3 hours daily than private college (16%) while mobile phone usage was almost similar amongst both.

Majority of the respondents watched movies (47%), music videos (50.5%) and TV news (52.5%) rarely. Among girls and boys, most of the girls (46%) preferred daily soaps on TV while more boys (51%) were watching sports/athletics. On comparing college wise it was found that more respondents from private college i.e. 50, 48, 46 and 46 per cent were watching movies, music videos, TV news and daily soaps very oftenly as compared to those of 33, 31, 29 and 24 per cent from government college, respectively.

Results revealed that most of the respondents (63%) were satisfied with their body physique. As compared to boys (17%), more girls (32%) wanted to lose weight. A higher percentage (43.5%) of the college going students thought that TV models have a perfect body physique/figure. More boys (64%) than girls (47%) thought that TV models have a perfect body physique. Majority (49.5%) of the respondents did not feel motivated to lose weight by watching TV models but they wanted to attain a figure/physique like a fashion model (33.5%) or a friend (22%). Majority (67%) of the respondents never skipped a meal after watching /reading a fashion programme/article/magazine. Among those who skipped meals, girls (38%) were more. Less percentage of respondents started exercise (42.5%) or joined a gym/fitness centre (30.5%) because of watching any TV program or reading an article. More boys (49%) than girls (26%) started exercise because of reading an article in a magazine or watching TV program and joined a gym/fitness centre. Most of the college going students (47.5%) sometimes tried new food products after watching advertisements. Majority of the respondents (63%) thought that junk food product/beverage advertisements cause their increased intake among youth. Majority of the respondents (45%) were taking snacks while watching TV (more girls than boys) and they tried new products mostly after knowing it from friends (52.5%) and TV commercials (29%). Most of the respondents (32%) visited food

store/food joints/superstores/marts monthly. More students from private college (34%) visited food store/food joints/superstores/marts weekly as compared to 23 per cent from government college. Eating without hunger was practiced only sometimes among most (38%) of the students. Also more girls (18%) very often ate without hunger than the boys (12%).

Samosa/bread pakora (39.5%), fresh juice (30%) and tea/coffee (28%) were the foods taken very oftenly by the respondents followed by potato chips (38.5%), cold drinks (37.5%), burger (34.5%) , noodles (32.5%) and patty (29%) which were preferred sometimes and RTS was rarely preferred by students while dosa and pizza were not available in college canteen. More respondents from private college (42%) preferred *samosa/bread pakora* very often while almost equal percentage of respondents from both the colleges preferred fresh juice and tea/coffee. Almost equal percentage of girls (39%) and boys (40%) were eating samosa/bread pakora very often while more boys (39%) than girls (26%) preferred cold drinks. On the other hand, tea/coffee was preferred very often by girls (37%) as compared to 19 per cent boys. Also more girls than boys were eating noodles sometimes. A higher percentage of boys (43%) very often preferred fresh juice in college canteen as compared to 18 per cent girls.

A higher percentage of respondents (49.5%) took one meal outside home daily. More respondents from government college (45%) as compared to private college (34%) were taking one meal outside while more girls (42%) took one meal outside as compared to boys (37%). Skipping of meals was more in respondents from private college (29%) than in government college students (13%). On the other hand, more girls (24%) than boys (18%) skipped meals. Meals taken outside rarely included fruits/vegetables/juices (52%) and soft drinks/fast food (43.5%) according to most of the respondents. More respondents from private college took soft drinks/fast food (39%) outside home than fruits/vegetables/juices (23%) while more girls (39%) mostly took soft drinks/fast foods outside home as compared to 35 per cent of boys.

Foods that were taken once daily by majority of the respondents were milk (61%). Food items included once daily by the respondents included: curd (44.5%), tea (43.5%), fruits (46%), fruit chat/salad (40.5%), breakfast cereals (40.5%), fresh juice (37%), soft drinks (32%), pulses (49.5%) and *chapatti* (42.5%).Similar trend was found for these foods among both the colleges. More boys (36%) were taking cold drinks than girls (28%) once daily. It was found that more respondents from private college consumed milk (22%) and *chapatti* (63%) 2-3 times daily while a higher percentage of government college (29%) respondents consumed vegetables than private college students (16%). Chips/fries, pasta/noodles, macaroni, pizza, burger, *samosa/bread pakora*, patties, ice cream and pastries were consumed once weekly by most of the respondents. Sex-wise variation showed that more girls consumed pasta/noodles (24%) and macaroni (23%) once weekly as compared to 18 and 17 per cent of the boys, respectively. On the contrary, more boys had pizza (17%) and samosa (32%) than

girls (11% and 26%). Coffee-hot cold, RTS juice, toppings such as jam, cheese, cheese spreads, meat and fish products, butter, peanut butter, mayonnaise and fruit cream, *dosa, idli*, pasta/noodles, macaroni, porridge, pizza, burger, uttapam, sandwiches/toast, patties, fish and fish products, meat and poultry, eggs, alcoholic beverages were the foods that were never consumed by majority of the respondents.

Results indicated that intake of cereals, roots and tubers, milk and milk products, fats and oils and fruits were higher than 100 per cent of RDI in both the boys and girls. Intake of rest of the food stuffs such as pulses, other vegetables, green leafy vegetables and sugar and jaggery were lower than the RDI. College-wise results revealed that mean intake of cereals, roots and tubers, green leafy vegetables and sugar and jaggery were significantly ($p>0.05$) higher among government college respondents as compared to private college respondents.

Adequacy of food intake revealed that intake of cereals was adequate (100 per cent of RDA) among boys and girls (17-18Y) while the intakes of other food stuffs were marginally adequate and marginally inadequate. Majority (72.7%) of boys (18-21Y) took marginally adequate amounts of cereals while most (13.6%)) of the girls (18-21Y) took their marginally inadequate amounts of cereals. Most of the boys (54.5%) consumed pulses adequately compared to marginally inadequate intake by most of the girls (50%). Consumption of milk and milk products were adequate among boys while it was marginally adequate among girls. Intakes of other foods such as green leafy vegetables, other vegetables, fats and oils, fruits and sugar and jaggery were marginally adequate, marginally inadequate and inadequate, respectively by both the girls and boys.

Intakes of energy, fat, retinol and calcium were upto the mark among girls and boys when compared to their respective RDAs. Protein intake was almost equal to RDA among girls and boys (17-18Y) and boys (18-21Y) while it was significantly ($p<0.05$) lower among girls of 18-21 years. Mean intakes of iron and folic acid was significantly ($p<0.05$) lower among both boys and girls. Thiamine intake was higher than RDA among both the boys and girls. Vitamin C intakes were more than RDA among boys while it was significantly ($p<0.05$) lower than the RDA. Riboflavin was lower than RDA among boys. College-wise comparison showed that students from government college had significantly ($p<0.05$) higher intakes of iron and retinol than those from private college. On the other hand, private college respondents had significantly ($p<0.05$) higher intake of vitamin C than government college students.

Present study showed that energy intake of boys of 17-18 years and 18-21 years age was adequate and marginally adequate while it was marginally adequate, respectively among all the girls. Protein intake was adequate among boys and marginally inadequate (17-18Y) and marginally adequate (18-21Y) among girls.

Regarding dietary diversity scores (DDS), it was found majority (46.6%) of the students consumed six food out of total 13 food groups. Diets continued to diversify as scores

increased. All the students consumed items from the food groupsô viz. starchy staples, all other fruits and vegetables and vitamin-C rich fruits. With the increasing DDS, the consumption percentage of all legumes and nuts and dairy products increased. The consumption of vitamin A-rich dark green leafy vegetables, vitamin A-rich deep yellow, orange and red vegetables and vitamin C-rich vegetables was restricted to higher DDS (8). Mean DDS of respondents was 5.75. DDS of government and private college students and boys and girls was almost equal. Majority of the students consumed foods from the food group all dairy. It was found that respondents with the highest DDS (6.1) had a family income between Rs.10-30,000/month.

Mean height, weight, waist circumference, waist-to-hip ratio were significantly ($p<0.05$) lower among girls while among boys weight, height and waist-to-hip ratio were almost similar to the reference values. It was also found that majority of the boys (25%) and girls (33%) had normal 6weight; 4 per cent boys while only 2 per cent girls were found to be obese as per BMI classification.

On the basis of present study, it was concluded that media exposure did not have much influence on majority of the youth studying in both colleges of Gurgaon, as they were satisfied with their body figure/physique and also no food disorders were found among respondents though some of them wished to attain figure like a TV model. Also there were few respondents who tried new food products by knowing it from mass media (TV, internet, newspaper) or friends and after visiting restaurants/super markets. Most of them were taking *samosa/bread pakora*, tea/coffee, cold drinks and juices from college canteen. Skipping of meals was common especially among girls. Their intakes of energy, protein, fat, calcium and retinol were almost equal to the RDAs. Iron intake was less than RDA in daily diets of both girls and boys as they were taking lesser amount of iron rich foods. Average dietary diversity score was 5.1 out of 13 i.e. they consumed six food groups out of total 13 food groups. They are required to diversify their diets by including vitamin A rich dark green leafy vegetables, vitamin A rich deep, yellow, orange and red vegetables and vitamin C rich vegetables. Among girls height, weight, waist circumference and waist-to-hip ratio were lower than the reference values which may be due to genetic factors and various environmental factors or because of skipping of meals oftenly. In case of boys, these anthropometric measurements were upto the reference values. Only small percentages of girls were overweight and obese as per BMI while 4 per cent of the boys were overweight no incidence of obesity were noticed. There is a need to impart nutrition education to youth for creating awareness about the diversification of diets to get various nutrients from a variety of foods rather than a selected list of few ones to attain a good nutritional status.

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ANNEXURE - I

Nutrition Transition as Affected by Mass Media : A Study on Youth in Metropolitan city of Haryana

QUESTIONNAIRE

General Information

Sr. No. _____

Name of the Respondent : _____ Date : _____

Age : ____ yrs.

Sex : Male/Female

Hostler/Day scholar/Daily commuter

Education :

School : Pvt./Govt. College : Pvt./Govt. Degree College/Professional

Socio-Demographic details :

Permanent residence : Rural/small city/metropolitan

Address : _____

Religion : _____

Category : Gen./SC/BC/OBC

Religious : Very strictly/liberal/etheist

Family Background :

Family type : Joint/Nuclear

Family size : >4 / 4-6 / >6

Family income : Below Rs. 10,000/10-30,000/30-60,000/60,000-1 lakh/ Above 1 lakh per month

Background Information of the Respondent

Sr. No.	Name of the family member	Relation with the respondent	Sex	Age	Education	Occupation	Monthly income	Health (in your opinion) Fit/under wt./ over wt./obese
1.								
2.								
3.								
4.								
5.								
6.								

Food Consumption Pattern

A) Eating Habits

i) Vegetarian

ii) Non-vegetarian

iii) Eggetarian

B) Number of Meals

Meals	Yes / No	Any other
Early morning		
Breakfast		
Lunch		
Evening tea		
Dinner		

Anthropometric Details

1. Body wt. :
2. Height :
3. BMI :
4. Body fat percent :
5. Waist circumference :
6. Hip circumference
7. Waist/Hip ratio :

What do you think ?

Are you satisfied with body physique/figure?	Yes/No
You would like to	Lose weight/Gain weight/No changes
Do you think that the TV models have perfect body shape/ figure?	Yes/No/Not sure
Do you feel motivated to lose weight by watching TV models?	Yes/No/Not sure
What type of body figure you desire to want to attain?	A fashion model/any of your neighbour/your friend
Do you skip meals after watching/reading a fashion programme/article?	Yes/No
Have you ever considered self induced vomiting to lose weight?	Yes/No
From where did you get this idea	Media/friend/family/all
Have you ever gone on a diet to lose weight because of an article in a magazine/TV programme?	Yes/No
Have you ever started exercise because of an article in a magazine or TV article?	Yes/No
Did you ever joined a gym/fitness centre because of any TV programme?	Yes/No
Do you take alcohol?	Yes/No
If yes, you take alcohol for	Gaining weight/taste
Do you try new food products after watching ads?	Yes/No/Sometimes
Do you agree that junk food product/beverage ads cause there increased intake among youth?	Yes/No
What do you think that presence of a particular fashion/film model in ad affects consumption of the advertised food/drink?	Yes/No
You take snacks while	Watching TV/working on net/reading leisurely/all /none
You usually tend to try new snacks after knowing about it from	
TV Commercial	Very often/rarely/never
Internet	Very often/rarely/never
Newspaper/newsletter	Very often/rarely/never

Mass Media : Interaction and Effect

Source	**Contract period**
Television	Never/once in a few days/daily (1 hr./2-3 hr./more)
Internet	Never/once in a few days/daily (1 hr./2-3 hr./more)
Radio / FM	Never/once in a few days/daily (1 hr./2-3 hr./more)
Mobile Phone	Never/once in a few days/daily (1 hr./2-3 hr./more)
Newspaper	Never/once in a few days/daily (1 hr./2-3 hr./more)
Fashion Magazines	Never/once in a few days/daily (1 hr./2-3 hr./more)
Science Magazines	Never/once in a few days/daily (1 hr./2-3 hr./more)
Sports Magazines	Never/once in a few days/daily (1 hr./2-3 hr./more)
Comic Books	Never/once in a few days/daily (1 hr./2-3 hr./more)
Programs you prefer to watch on TV or Internet	
Movies	Never/rarely/very often
Music videos	Never/rarely/very often
Daily soaps	Never/rarely/very often
Sports/Athletics	Never/rarely/very often
Science programs	Never/rarely/very often
News	Never/rarely/very often
Cartoons	Never/rarely/very often
Friends	Never/rarely/very often
Ads in supermarkets	Never/rarely/very often
Eating habits	
How often do you visit food store/food joints/superstores?	Daily/weekly/monthly/rarely
Ready to eat foods on the front shelves make you buy it	Always/never/sometimes
Do you eat without hunger?	Very often/sometimes/rarely/never
Foods you prefer at college canteen	
Dosa	Very often/sometimes/rarely/never/not available
Noodles	Very often/sometimes/rarely/never/not available
Parantha	Very often/sometimes/rarely/never/not available
Burger	Very often/sometimes/rarely/never/not available
Patty	Very often/sometimes/rarely/never/not available
Pizza	Very often/sometimes/rarely/never/not available
Samosa/bread pakora	Very often/sometimes/rarely/never/not available
Sandwich	Very often/sometimes/rarely/never/not available
Pastry	Very often/sometimes/rarely/never/not available
Potato chips/fries	Very often/sometimes/rarely/never/not available
Milkshake	Very often/sometimes/rarely/never/not available
Cold drink	Very often/sometimes/rarely/never/not available
Fresh juice	Very often/sometimes/rarely/never/not available
Ready to serve juice	Very often/sometimes/rarely/never/not available
Tea/Coffee	Very often/sometimes/rarely/never/not available
No. of meals you take outside home	1/2/3/rarely
Meals taken outside home comprise of	
a) Fruits/vegetables/juice	Rarely/mostly/always
b) Soft drinks/fast foods	Rarely/mostly/always
Do you skip meals to reduce weight?	Yes/No/Sometimes

Food Frequency Questionnaire

S. No.	Food product	Once daily	2-3 times daily	Once weekly	2-3 times weekly	Once month	2-3 times month	Rarely	Never
1.	Milk								
2.	Yoghurt/curd								
3.	Milk and other shakes								
4.	Tea								
5.	Coffee-hot/cold								
6.	Fresh juice								
7.	RTS juice								
8.	Soft drinks								
9.	Breakfast cereals								
10.	Topping for open sandwiches								
a)	Jam								
b)	Cheese								
c)	Cheese spreads								
d)	Meat and fish products								
e)	Fat (Butter)								
f)	Peanut butter								
g)	Mayonnaise								
11.	Fruits								
a)	Fruit chat/salad								
b)	Fruit cream								
12.	Vegetables								
a)	Green leafy								
b)	Others								
13.	Potato								
a)	as vegetables								
b)	as snacks (chips/ fries)								
14.	Rice								
a)	Dosa								
b)	Idli								
15.	Pasta/noodles								
16.	Macaroni								
17.	Porridge								
18.	Pulses								
19.	Chapatti								
20.	Pizza								
21.	Burger								
22.	Samosa								
23.	Uttapam								
24.	Bread pakora								
25.	Sandwiches/toast								
26.	Patties								
27.	Fish and fish products								
28.	Meat and poultry								
29.	Eggs								
30.	Ice cream								
31.	Cakes								
32.	Pastries								
33.	Desserts (sweet dish)								
34.	Chocolate								
35.	Snacks								
36.	Alcoholic beverages								

Date : _____ **Day : _____**

Dietary Record (24 Hours Dietary Recall Method)

Meal pattern	Menu	Amount consumed	Raw ingredients	Quantity
1st meal/Drink (Specify)				
Time				
Name				
2nd Meal				
Time				
Name				
3rd Meal				
Time				
Name				
4th Meal				
Time				
Name				
5th Meal				
Time				
Name				

ABSTRACT

Title of thesis	:	Nutrition Transition as Affected by Mass Media: A Study on Youth in a Metropolitan city of Haryana
Full name of the degree holder	:	**URVASHI MEHLAWAT**
Admission Number	:	2010HS153M
Title of degree	:	Masters of Science
Name and address of Major Advisor	:	Dr. Neelam Khetarpaul Professor Deptt. of Foods and Nutrition CCS HAU, Hisar ï 125004
Degree awarding university	:	CCS Haryana Agricultural University Hisar
Year of award of degree	:	2013
Major subject	:	Foods and Nutrition
Total number of pages in thesis	:	112+vi+V
Number of words in abstract	:	Approx. 425

Key Words: Food intake, Dietary diversity scores, Chronic energy deficiency and Obesity

The present study was undertaken in Gurgaon district of Haryana state. From D.S.D. Govt. College and DPG Institute of Technology and Management (Private College) a total of 200 (100 students from each college) college going students of 17-21 year age were selected randomly for the study. Information regarding mass media interaction, eating habits, food frequency and food disorders was collected. Anthropometric measurements, dietary intake (24-hour recall) and dietary diversity scores were used to assess the nutritional status of the college going students. Most preferred sources of information for respondents were TV (82.5%) followed by mobile phones (79.5%), newspaper (52%), internet (38%), radio/FM (27%) in descending order. More girls (39%) were watching television for 2-3 hours daily as compared to boys (21%) and more girls (46%) preferred watching daily soaps than boys (24%) who were watching more of sports/athletics programs. Most of the respondents (63%) were satisfied with their body physique/figure. More number of girls (32%) wanted to lose weight than boys (17%). More girls (38%) than boys (28%) skipped meals after watching/ reading a fashion programme/article/magazine. *Samosa/bread pakora* (39.5%), fresh juice (30%) and tea/coffee (28%) were the foods taken very oftenly by the respondents; meals taken outside rarely included fruits/vegetables/juices (52%) and soft drinks/fast food (43.5%) and a higher percentage of respondents (49.5%) took one meal outside home daily. The intakes of pulses, roots & tubers, other vegetables, GLVôs and sugar & jaggery were significantly lower among girls and boys of 17-18 years except for boys (18-21Y) who had higher intake of roots & tuber. Cereal intakes of both girls and boys were higher than the RDI. Iron intake was significantly ($p<0.05$) lower in girls and boys of 17-21 years. Girls (17-18Y) had significantly ($p<0.05$) lower intakes of folic acid while boys (18-21Y) consumed significantly lower amount of riboflavin. Mean dietary diversity score was 5.7. All of the students consumed items from the four food groupsô viz. starchy staples, all other fruits and vegetables and vitamin-C rich fruits. Mean weight, waist circumference and waist-to-hip ratio of girls and mean waist circumference of boys of 17-21 years were significantly lower than their respective reference values. In the overweight category, there were only 9 per cent girls and 4 per cent boys while only 2 per cent girls were found to be obese and as per body fat per cent there were 14 per cent girls and 13 per cent boys who were overweight. Obesity was prevalent among girls (32%) and boys (22%).

MAJOR ADVISOR DEGREE HOLDER

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Degree	University/Board	Year of passing	Percentage	Subjects
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Intermediate	CBSE	2007	71.8	Eng. Core, Physics, Chemistry, Biology, Biotechnology
B.Sc. (Home science)	Banasthali University, Rajasthan	2010	77.06	1.Food Science & Nutrition 2.Clothing & Textile 3.Human Development 4.Family Resource Management 5.Extension Education & Communication
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