

**An educational intervention to study nutritional  
status and dietary pattern of girls residing in  
hostels for coaching**

*With special reference to Kota city*



**THESIS**  
**For**  
**DOCTOR OF PHILOSOPHY**  
**In**  
**HOME SCIENCE**  
**(SOCIAL SCIENCES)**  
**By**  
**ANJALI SAXENA**

**Under the supervision of**  
**Dr.Bindu Chaturvedi**  
**Lecturer (GPEM)**  
**J.D.B.Govt.Girls College, Kota**  
**UNIVERSITY OF KOTA, KOTA (Raj.)**  
**YEAR 2016**

## **SUPERVISOR'S CERTIFICATE**

It's a pleasure to certify that the thesis titled '**An Educational Intervention to study nutritional status and dietary pattern of girls residing in hostels for coaching**' encapsulates a record of the findings of research executed and submitted by Ms.Anjali Saxena to the University of Kota for the partial fulfillment of the requirements for the award of the Degree of Doctor of Philosophy in Home Science. During the course of her pursuance of the thesis, she sincerely lived up to the norms laid down by the University.

I sincerely recommend the submission.

Place:

Dr. Bindu Chaturvedi

Date:

Research Supervisor

Lecturer in GPEM

J.D.B Govt. Girls College, Kota

## CANDIDATE'S DECLARATION

This is to hereby declare with utmost honesty and earnestness that the work being produced as a thesis titled '**An Educational Intervention to study the Nutritional status and dietary pattern of girls residing in hostels for coaching**' to the University of Kota is my own work to the best of my belief and knowledge. Every single bit of sentence is original and doesn't contain any material published previously. Nor does it contain any material that has been accepted earlier for the award of any Degree or Diploma except for what has been duly quoted and gracefully acknowledged.

Place: Kota

ANJALI SAXENA

Date:

Research Scholar

University of Kota

(Reg. 1504/13)

## ACKNOWLEDGEMENT

Even before I start expressing my deepest thankfulness to all the near and dear ones around me who were instrumental in the shaping up of thesis, I would like to be humble enough to convey my sincerest gratitude to my Supervisor and Guide **Dr. Bindu Chaturvedi** without whose selfless endeavor; this thesis wouldn't have been possible. Her constant support at each step, whether it be during the building up of concept, while collecting the data and also while writing the thesis laid the foundation for the whole work as it emerged out to be. It wasn't just her support that I counted upon, the way she boosted up my moral all the while; even during the times I felt low, worked wonders. I owe it all to her.

I would further like to thank my teacher and mentor, **Dr. Neelima Verma** for all the love and care she showered upon me and enthused me all the while reminding me in the right earnest what I was capable of. Her never-ending commitment towards my betterment and the charisma she bears enabled me enough to initiate this rigorous task. She made it a point to be always there for me and gave me enough reason to look up to her for guidance.

Furthermore, I would like to pay my profound regards to my mother **Mrs. Indra Saxena**, who took all the pains in the world to bring me up. The way she loved and pampered me made me what I am. Her care and motherly guidance enlightened and encouraged me to believe in myself and my spirits. All in all, her inspiration came in pretty handy while I had to face all the adversities as I maneuvered through the complexities of my work.

Last but not the least, I would like to convey my sincerest regards to the authorities at the University of Kota, who were more than ready to lend me a helping hand whenever I required. It was because of their kind support that I found myself sufficiently capable to tread the path I had chosen.

Moreover, it was my faith in Lord Krishna that strengthened me a lot and motivated me all the while I trudged along.

ANJALI SAXENA

## **PREFACE**

To the readers, the study promises to be a narration that encapsulates the pathos young girls have to go through while being away from parents as they don't just have to manage a routine that they are not used to, they also have to consume food that is far more compromised than one could ever imagine. Food is universally recognized to be the most significant entity that keeps an individual going for his life. It's not just the right hygiene, the ingredients or the preparation that matters the most, what really matters is the schedule these young girls follow while consuming their meals.

The study is a glimpse of what these girls prefer to consume while being away from parents, the habits they develop, the kind of food they are offered at their hostels and paying guest facilities, the quality it possesses and the physical traumas they have to bear as a result of consuming that food. It has beautifully showcased a life that adolescent girls have to sustain in deprivation where lack of anything nutritious becomes a norm. Whether it be hygienically cooked food, fresh fruits or milk, the girls have to make do with everything substandard and shoddy. The study is not just an in depth research into the consumption choices made by young girls, it also delves deep into the vital nutrients that the girls miss as a result of consuming a particular meal and the repercussions they have to put up with. Though a lot of caution has been exercised while conducting the research, it was pretty tough dealing with adolescent girls as most of them live in a make believe world where reality is something that is casually ignored and life is more about fictitious goals and exotic choices.

Being with parents safeguards these girls against any ailment or untoward happening that they might fall prey to but the same luxury is not accessible while being away from them. Almost every problem has to be single handedly dealt with and the girls have to be pretty much decisive when it comes to taking decisions what they really wish to eat and what they don't. It is this immature age when most of the girls land upon decisions which they have to regret later as choosing the right food requires discretion of an order which one can only significantly gain with age. The market is full of choices and

making the right choice becomes an ordeal of a kind. The study has done its best to mirror the dilemma of these young girls while making food choices. All the more, the study has been interventional in nature which made us counsel the hostel living girls mandatorily. Counseling such adolescents was a challenge of sorts as it meant a one on one consultation. The research had to deal with constraints unique in nature as getting such youngsters to answer questions that directly take a peek into their personal lives was a job full of obstructions and uncertainties. Further, girls in this age group are relatively healthier than other age groups which made it even tougher to convince them with the view that what they were eating was not exactly useful for their bodily well being. All in all the study is all about food choices young girls make while living at hostels and how it directly or indirectly impacts the quality of life they aspire for. Adolescence is an age that experiences turmoils of change, not just emotional but physical as well as hormonal which necessitates the need to study these young ones with utmost care. Another important aspect of this change is food. With growing age, these adolescents develop a different sense of taste which hadn't been there since they were born. It's an age when they wish to experience food from far and beyond, some of which might not be good and useful and might also wreak upon them problems of uncontrollable nature. Thus studying the impact of food on adolescent girls gives us a useful insight into assessing their nutritional status which in turn might educate the researchers about the unique correlation between youngsters and their food choices.

Moreover, the study has assigned a position of prime importance to nutritional counseling, as counseling has always had the potential to change the opinion of adolescents even though to an insignificant extent. The major focus was to put across the idea that nutrition holds the key to a successful life and thereby food should be consumed with planning and caution as it may decide the quality of life an individual might live in the years to come. Intervention being the prime motive seems justified as the findings made it amply clear as to what these adolescents lack in terms of a sound nutrition. Does the food they regularly consume contain the right mix of nutrients like the proteins and vitamins? What do they love eating for breakfast and for lunch? Do they routinely consume their breakfast? And if they do ignore their meals, what do they

consume instead to make up for the lost nutrition? These all questions routinely boggle us up and the study has tried its best to find relevant explanations to the questions and to a large extent the answers have been what were expected and what had been long known except for a few exceptions. The results were vital as they helped the researcher to study the data thoroughly to further strategize the intervention and the best possible tools to go about it.

To sum it all up, the study has been one giant exercise in assessing, strategizing, accumulating and analyzing the data pertaining to the food habits of adolescents, reading the special impact of the kind of meals they are consuming and finally coming to an informed conclusion as to what all could be done to somehow get these young adolescents to start taking meals that could be the most nutritive thereby assisting them in their growth.

## TABLE OF CONTENTS

Chapter No.	Topic	Page No.
	Supervisor's Certificate	i
	Candidate's Declaration	ii
	Acknowledgement	iii
	Preface	iv
	TABLE OF CONTENTS	vi
	LIST OF TABLE	xii
	LIST OF FIGURES	xviii
	List of Abbreviations	xxii
<b>CHAPTER – I</b>	<b>INTRODUCTION</b>	<b>1</b>
	1.1 INTRODUCTION 1.1.1 KOTA- SETTING BENCHMARKS IN EDUCATION 1.1.2 HOW KOTA METAMORPHOSED INTO A COACHING HUB 1.1.3 INFRASTRUCTURE 1.1.4 SERVICES 1.1.5 HOSTELS AND PAYING GUEST FACILITIES. 1.1.6 MESS AND RESTAURANTS 1.1.7 TRANSPORTATION 1.1.8 HOTELS 1.1.9 RETAIL STORES AND OUTLETS	

	1.1.10 SHOPPING MALLS AND COMPLEXES	
	1.1.11 EATING BEHAVIOUR AND PRACTICES AT KOTA	
1.2	NUTRITIONAL STATUS OF ADOLESCENTS	
	1.2.1 MACRONUTRIENTS	
	1.2.2 MICRONUTRIENTS	
1.3	HEALTH PROBLEMS WITH ADOLESCENTS ARISING OUT OF LACK OF PROPER NUTRITION	
	1.3.1 ANOREXIA NERVOSA	
	1.3.2 OBESITY	
	1.3.3 ANAEMIA	
	1.3.4 ACNE	
	1.3.5 DIABETES	
	1.3.6 EYE AILMENTS	
	1.3.7 IRREGULAR MENSTRUAL CYCLES	
	1.3.8 THYROID	
	1.3.9 GROWTH RETARDATION	
	1.3.10 WEAK BONES	
	1.3.11 TEETH CAVITIES	
	1.3.12 SKIN PROBLEMS	
	1.3.13 GRAYISH HAIR	
	1.3.14 BACKACHE	

	1.4 SIGNIFICANCE OF THE STUDY 1.5 CONTRIBUTION OF THE STUDY 1.6 OBJECTIVES OF THE RESEARCH WORK 1.7 RATIONALE FOR CHOOSING THE ABOVE OBJECTIVES 1.8 HYPOTHESIS 1.9 RATIONALE FOR CHOOSING THE AFORESAID HYPOTHESIS	
<b>CHAPTER – II</b>	<b>REVIEW OF LITERATURE</b>	<b>91</b>
	A. STUDIES RELATED TO NUTRITIONAL STATUS B. STUDIES RELATED TO HEALTH AND BEHAVIORAL PROBLEMS C. STUDIES RELATED TO DIETARY PATTERN D. STUDIES RELATED TO NUTRITION COUNSELING, SOCIAL AND PSYCHOLOGICAL FACTORS, ETC.	
<b>CHAPTER – III</b>	<b>RESEARCH METHODOLOGY</b>	<b>127</b>
	3.1 RESEARCH DOMAIN 3.2 SELECTION OF SUBJECTS 3.3 TOOLS USED 3.4 PROCEDURE USED FOR DATA COLLECTION 3.5 FOOD INTAKE AND ANTHROPOMETRIC	

	<p>PARAMETERS</p> <p>3.6 NUTRITIONAL COUNSELLING</p> <p>3.7 INTERVENTION</p> <p>3.8 STATISTICAL ANALYSIS OF DATA GATHERED</p> <p>3.9 NULL HYPOTHESIS</p>	
<b>CHAPTER-IV</b>	<b>ANALYSIS AND INFERENCES</b>	<b>154</b>
	<p>4.1 GIRLS EATING AT FAST FOOD RESTAURANTS</p> <p>4.2 INTERVENTION</p> <p>4.3 CHANGE IN NUTRITIONAL STATUS</p> <p>4.4 CHANGE IN THE NUMBER OF GIRLS CONSUMING FRESH LEAFY VEGETABLES</p> <p>4.5 CHANGE IN THE NUMBER OF GIRLS CONSUMING FRUITS AND FRUIT JUICES</p> <p>4.6 GIRLS CONSUMING BREAKFAST</p> <p>4.7 GIRLS CONSUMING AFTERNOON SNACKS</p> <p>4.8 GIRLS CONSUMING UNHEALTHY DRINKS</p> <p>4.9 GIRLS CONSUMING HEALTHY DRINKS</p> <p>4.10 GIRLS CONSUMING FATS AND SWEETS</p> <p>4.11 CHANGE IN HEALTH PROBLEMS EXPERIENCED BY GIRLS</p>	

<b>CHAPTER –V</b>	<b>FINDINGS AND REVELATIONS</b>	<b>255</b>
	5.1 FINDINGS AND REVELATIONS 5.2 SUGGESTIONS / RECOMMENDATIONS 5.3 LIMITATIONS	
	<b>BIBLIOGRAPHY</b>	<b>272</b>
	<b>APPENDIX</b>	<b>286</b>

## LIST OF TABLES

S.No.	Table No.	Page No.
1	Tabel : 1.1 Depicting number of girls eating at restaurants and hostels	5
2	Table : 1.2 Recommended dietary allowances as per ICMR	49
3	Table : 3.1	133
4	Table : 3.2 Figures depicting mean deviation	148
5	Table : 3.3 Figures depicting calculated standard deviations	150
6	Table : 4.1 Figures depicting number of siblings	156
7	Table : 4.2 Depicting number of girls pursuing various courses	158
8	Table : 4.3 figures depicting number of girls requiring medication for various ailments	160
9	Table : 4.4 Figures depicting distribution of girls being treated for ailments	162
10	Table : 4.5 Figures depicting girls consuming and missing breakfasts	164
11	Table : 4.6 Figures denoting number of girls consuming lunch	166
12	Table : 4.7 Figures depicting supper consumption pattern of girls	167
13	Table : 4.8 Snacks consumption pattern of girls	169
14	Table : 4.9 Figures showing number of girls eating at fast food restaurants	171
15	Table : 4.10 figures denoting number of girls in Experimental group consuming unhealthy drinks	173

16	Table 4.11 Figures depicting number of girls in Controlled group consuming unhealthy drinks	174
17	Table : 4.12 Statistical calculation of number of girls consuming unhealthy drinks	175
18	Table : 4.13 Figures depicting number of girls in Experimental group consuming healthy drinks	176
19	Table 4.14 Figures depicting number of girls in Controlled group consuming healthy drinks	177
20	Table : 4.15 Statistical calculation of number of girls consuming healthy drinks	178
21	Table 4.16 Figures depicting number of girls in the Experimental group consuming grains and grain derivatives	179
22	Table 4.17 Figures depicting number of girls in the Controlled group consuming grains and grain derivatives	180
23	Table : 4.18 Application of statistical tools on figures denoting number of girls consuming grain derivatives	181
24	Table 4.19 figures depicting number of girls in the Experimental group consuming fresh vegetables	182
25	Table 4.20 Figures clarifying number of girls in the Controlled Group consuming fresh vegetables	183
26	Table : 4.21 Statistical calculation of number of girls consuming fresh vegetables	184
27	Table 4.22 Values clarifying number of girls in the Experimental Group consuming fruits and fruit juices	185
28	Table 4.23 Figures clarifying fruit consumption pattern among girls in the Controlled Group	186
29	Table : 4.24 Statistical calculation of girls consuming fruits and fruit juices	187

30	Table : 4.25 Figures depicting number of Experimental Group girls consuming milk products	188
31	Table : 4.26 Figures depicting number of Controlled Group girls consuming milk products	189
32	Table 4.27 Statistical calculation of number of girls consuming milk products	190
33	Table : 4.28 Figures depicting number of Experimental Group girls consuming meat	191
34	Table : 4.29 Figures depicting number of Controlled Group girls consuming meat and meat products	192
35	Table 4.30 Statistical calculation for number of girls consuming meat	193
36	Table : 4.31 Figures depicting number of Experiments Group girls consuming fats and sweets	194
37	Table : 4.32 Figures depicting number of Controlled Group girls consuming fats and sweets	195
38	Table 4.33 Statistical calculation of number of girls consuming sweets	196
39	Table : 4.34 Figures depicting number of experimental girls involved in physical exercises	197
40	Table : 4.35 Figures depicting number of girls in Controlled group involved in physical exercises	198
41	Table : 4.36 Figures depicting number of experimental group girls wasting time on mobiles and computer games	200
42	Table : 4.37 Figures depicting number of Controlled group girls wasting time on mobiles and computer games	201
43	Table : 4.38 Figures depicting number of experimental group girls consuming vitamin pills	203

44	Table : 4.39 Figures depicting number of Controlled group girls consuming vitamin pills	204
45	Table : 4.40 Comparative figures of girls adhering to diet plans and worried about body image	206
46	Table : 4.41 Various breakfast items and their energy equivalents	208
47	Table : 4.42 Energy equivalents of nutrients consumed during lunch	210
48	Table : 4.43 Energy equivalents of nutrients consumed during supper	212
49	Table : 4.44 Energy equivalents of nutrients consumed in the form of wafers	214
50	Table : 4.45 Average calorie consumption	215
51	Table : 4.46 Recommended dietary allowances as per ICMR	216
52	Table : 4.47 Average calorie consumption for girls in the Controlled group	218
53	Table : 4.48 Source of food	219
54	Table : 4.49 Table signifying change in habits after intervention	222
55	Table : 4.50 Table signifying change in dietary habits after intervention	223
56	Table : 4.51 Figures signifying change in fruit consumption habits of girls	250
57	Table : 4.52 Figures signifying change in the number of girls consuming breakfast after intervention	225
58	Table : 4.53 Figures depicting change in the number of girls consuming snacks after intervention	226
59	Table : 4.54 Table signifying change in the number of girls consuming unhealthy drinks after intervention	227

60	Table : 4.55 Table signifying a positive change in number of girls consuming healthy drinks	228
61	Table : 4.56 Table signifying change in the number of girls consuming fats and sweets	229
62	Table : 4.57 Figures signifying change in the number of girls experiencing medical problems after intervention	230
63	Table 4.58 Nutrition Quality of life after Educational Intervention	231
64	Table : 4.59 Table depicting differences in food preferences	234
65	Table 4.60 Statistical calculation of tools denoting food preferences of girls	235
66	Table : 4.61 Figures depicting differences in eating behaviours	237
67	Table : 4.62 Figures depicting effect of family background on the consumption pattern of girls	239
68	Table 4.63 Statistical calculation of data denoting meat eating pattern of girls	240
69	Table : 4.64 Table depicting how knowledge of nutrition affects the overall calories consumed by adolescents	241
70	Table 4.65 Figures depicting statistical calculation of tools denoting change in calories after intervention	242
71	Table : 4.66 Table signifying average calories consumed in a day	244
72	Table 4.67 Figures denoting statistical calculation of nutrient consumption of girls	245
73	Table : 4.68 Figures depicting health problems due to lack of nutrition	246

74	Table 4.69 Statistical calculation of number of girls suffering from health problems	247
75	Table : 4.70 Figures depicting factors affecting weight management	268
76	Table 4.71 Figures depicting statistical calculation of factors affecting weight management	250
77	Table : 4.72 Table signifying improvement in dietary status after counseling	252
78	Table : 4.73 : statistical calculation depicting change after counseling	253

### List of Figures

S.No.	Fig. No.	Page No.
1	Fig. : 1.1	5
2	Fig. : 1.2 graph depicting percentage breakup of girls eating outside	15
3	Fig. : 1.3 percentage breakup of nutrients as required ideally	19
4	Fig. : 3.1 Distribution of girls in the Experimental group as per their eating choices	135
5	Fig. : 3.2 Chart on Healthy eating patterns	140
6	Fig. : 3.3 Poster on the best options available in meals	141
7	Fig. : 3.4 Chart on how to balance meals with calorific requirements	142
8	Fig. : 3.5 Poster educating adolescents on reducing LDL	143
9	Fig. 3.6 Leaflet handed over to the cooks and adolescents during the seminar	144
10	Fig 3.7 A collage consisting of PPTs presented during the workshops	145
11	Fig. : 4.1 Figures plotted on a graph denoting girls in two different age groups	158
12	Fig. : 4.2 Graph denoting number of girls requiring treatment for varied ailments	160
13	Fig. : 4.3 Graph denoting number of girls visited `doctor	162

14	Fig. : 4.4 Breakfast consumption pattern of girls	165
15	Fig. : 4.5 Graph denoting supper consumption pattern of girls	167
16	Fig. : 4.6 Graph denoting snack consumption pattern of girls	169
17	Fig. : 4.7 Pie distribution of number of girls in controlled as well as Experimental group eating at fast food restaurants	171
18	Fig. : 4.8 Graph depicting number of girls in Experimental group consuming unhealthy drinks	173
19	Fig. 4.9 Graph depicting number of girls in the Controlled group consuming unhealthy drinks	174
20	Fig. : 4.10 Healthy drinks consumption pattern of girls in Experimental group	176
21	Fig. : 4.11 Healthy drinks consumption pattern of girls in Controlled group	177
22	Fig. 4.12 Graph denoting grain consumption pattern of girls in the Experimental group	179
23	Fig. 4.13 Graph plotting denoting number of girls in the Controlled group consuming grains	180
24	Fig. 4.14 Graph denoting number of girls in the Experimental group consuming fresh vegetables	182
25	Fig. 4.15 Vegetable consumption pattern of girls in the Controlled group	183
26	Fig. 4.16 Fruit consumption pattern of girls in the Experimental group	185

27	Fig 4.17 Graph denoting fruit consumption pattern among girls in the Controlled group	186
28	Fig. 4.18 Graph denoting milk and milk product consumption pattern among girls in the Experimental group	188
29	Fig 4.19 Graph denoting milk and milk product consumption pattern among girls in the Controlled group	189
30	Fig. 4.20 Graph denoting meat and meat product consumption pattern among girls in the Experimental group	191
31	Fig 4.21 Graph denoting meat and meat product consumption pattern among girls in the Controlled group	192
32	Fig 4.22 Graph denoting fats and sweet consumption pattern among girls in the Experimental group	194
33	Fig. 4.23 Graph denoting fats and sweet consumption pattern among girls in the Controlled group	195
34	Fig. : 4.24 Graph denoting girls in the Experimental group involved in physical exercises	197
35	Fig. : 4.25 Graph denoting girls in controlled group involved in physical exercises	198
36	Fig. : 4.26 Graph denoting number of girls in Experimental group wasting time on mobile and computer games	200
37	Fig. : 4.27 Graph denoting number of girls in Controlled group wasting time on mobile and computer games	201
38	Fig 4.28 Graph denoting girls in the Experimental group consuming vitamin pills	203

39	Fig. : 4.29 Graph denoting number of girls in Controlled group consuming vitamin tablets	204
40	Fig. : 4.30 Differences in food preferences plotted on a bar graph	235
41	Fig. : 4.31 Graph denoting differences in eating behaviours	237
42	Fig. : 4.32 Figures depicting the effect of family background plotted on a bar	239
43	Fig 4.33 Graph denoting change in calories after intervention	242
44	Fig.4.34 Graph depicting nutrient consumption pattern of girls in a day	244
45	Fig. 4.35 Bar chart denoting change in health problems after intervention	247
46	Fig 4.36 Bar chart denoting factors affecting weight management	250
47	Fig. : 4.37 Figures depicting change in dietary status plotted on a bar chart	253

### List of Abbreviations

<b>S.No.</b>	<b>Abbreviations</b>	<b>Full form</b>
1.	BMI	Basel metabolic index
2.	TSFT	Triceps skin fold thickness
3.	MUAC	Mid upper arm circumference
4.	RDA	Recommended dietary allowances

# Chapter - I

## INTRODUCTION

## **1.1 INTRODUCTION**

Kota has been a fortress of education over the last two decades and students from across the country descend down to this town in the hope of making it big at competitive exams. This has made Kota a teeming hub of hostels, messes, motels, hotels and inns which over the years have developed into large ventures and business houses churning money in millions. Fooding has been one such business which has done exceptionally well, people have made careers out of running fast food outlets, restaurants, boarding houses, providing paying guest facilities to students coming to Kota from far and wide and even providing them facilities pertaining to laundry and day to day odds and ends. Life has taken an altogether different shape in Kota as even a small roadside vendor is deriving serious benefits out of being in Kota. Food industry has been a major beneficiary as at the end of the day these students can't go to bed with an empty belly and have to satiate themselves either by having a regular meal or anything they could lay their hands upon. A major chunk of the city turnover is through feeding the students with whatever they fancy. Consequentially, cuisine from across the country has made its way into the kitchens of all the guest houses around the city of Kota. Kota has boomed as a business destination over the last decade and the economy of the town has undergone a dramatic upheaval. It is all thanks to the unmatched education it offers. It is not just the economy that has blossomed, even the lifestyle of people in Kota has turned around in ways unimaginable. The way they dress up, the food they consume, their likes and dislikes, the targets they aspire for, in fact almost everything that is of human consequence has changed for good. Life could never have been more different in Kota than it is now.

### **1.1.1 KOTA- SETTING BENCHMARKS IN EDUCATION**

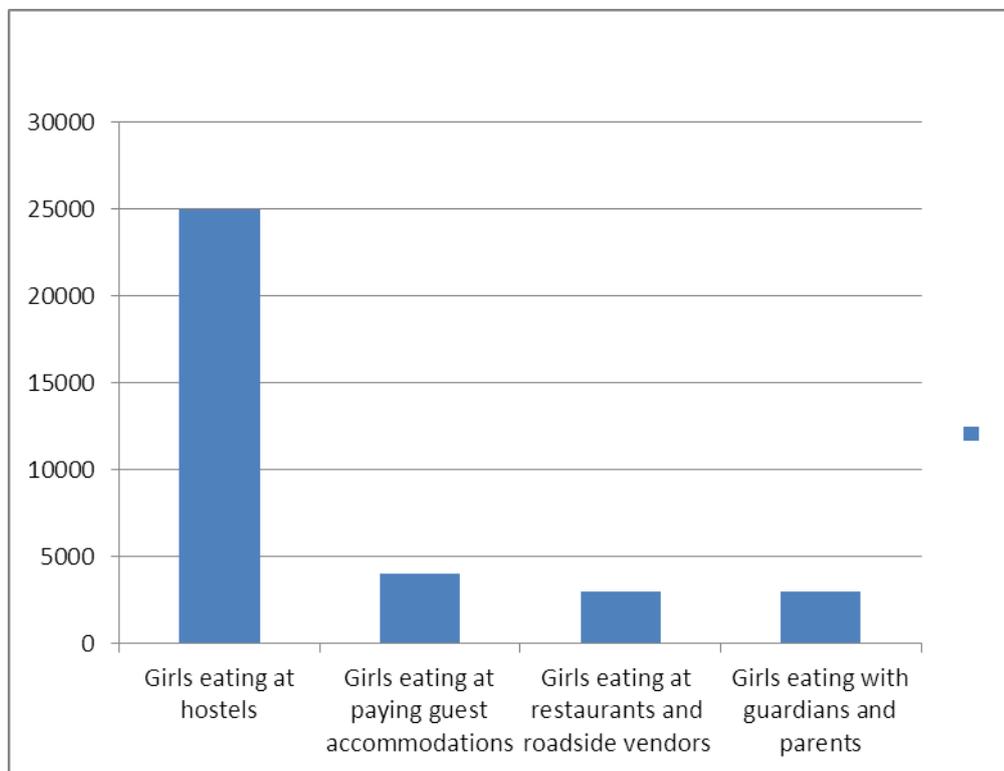
People in Kota have strived hard over the years to build the best out of this opportunity and now are reaping prosperous dividends. The motto is simple, Kota has learnt to provide the best it could to a vast majority of students who have made Kota their second home and have come out with flying colours in their

academic pursuits. It's not just the boys who have done wonders but even the girls have been no way less. Coaching for Competitions like JEE and various Medical entrance tests are the norm in Kota and teachers out here have armed themselves with relevant skills to deliver the best they could. Coaching has commercialized to such an extent that being a teacher in Kota is almost like striking a goldmine. Students from states as far and wide as Mizoram, Meghalaya, Tripura, Assam, West Bengal arrive over here every year with an aim to crack the most prestigious exams and stick to the city for a prolonged period of time spanning almost two years. This major influx of students from the length and breadth of India has given rise to the need to have eating facilities providing almost all kinds of cuisine catering to the varied tastes that students develop as a result of their background and upbringing. Food that was practically unknown to the people of Kota has made its way into the eateries and fooding joints across the city are now competing with each other to provide almost anything that the students demand at their whim. A laid back town that was almost unknown on the map of India has hit the headlines and is now virtually a destination that any serious student aspires to be at. If food is taken into serious consideration, paying guest facilities and joints have in fact learnt to adapt themselves to the changing tastes and emerging trends. Though nothing has happened all of a sudden and it has all been a gradual makeover but the introduction of foods of various regions has brought about a certain versatility in the way food has started being served. Eating joints have mushroomed in the nooks and corners of the city promising delicious and sumptuous food to gorge upon. The way the food is presented has changed, the ingredients might have also changed and newer delicacies and innovative recipes are gradually making waves in the town. But all these positives have entered with a shade of gray. Not everything edible being offered to the students is of value and hygienic. The roadside vendors offer substandard stuff with overused oil with almost miniscule nutritive value which may sometimes be absolutely perilous and risky. Even the food being offered in messes and paying guest facilities is not worth eating every day. It's not just the quality of food that lacks standard, it is also the preparation that falls short of idealism. Still what is being offered can be termed satisfactory by and large. All in all Kota has offered the students the best it

could in terms of boarding, lodging and cuisines of all sorts. Since Kota could boast of a student population that runs into lacs, it deems fit to be chosen as a destination when it comes to studying students and making certain analysis pertaining to certain chosen characteristics. Since food is what will be discussed in the entire narration, it's imperative to keep the focus on food, its types and its impact on the health of subjects. It will be of prime importance to notice how the city caters to special dietary needs of students in a young age group where experimenting with something new everyday is the norm. A randomly conducted chat with mess owners, shopkeepers and restaurateurs threw up certain rough figures that could be tabled at the outset.

**Tabel : 1.1** Depicting number of girls eating at restaurants and hostels

Girls eating at hostels	Girls eating at paying guest accommodations	Girls eating at restaurants and roadside vendors	Girls eating with guardians and parents
25000	4000	3000	3000



\*The above given data was accumulated arbitrarily in general conversations with hostel owners, shopkeepers and vendors.

**Fig. : 1.1**

These Coaching Institutes are not just drawing girls but even boys who outnumber the girls almost in every field of preparation. A random estimate that surfaced while conducting the study revealed that around 70,000 boys turn up every year, a figure that is much larger than that for girls. The data is a direct pick out of a leading daily '**Rajasthan Patrika**<sup>1</sup>' that quoted the figure in one of its latest issue.

Kota hasn't been such right from day one. It started off as a sleepy town in Rajasthan with practically no places of tourist interest, as such, people used to visit almost all the places in Rajasthan as they all have some or other historical monument to boast about but Kota was comfortably ignored as having just nothing to see and admire.

### **1.1.2 HOW KOTA METAMORPHOSED INTO A COACHING HUB**

There were a few industries manufacturing cement and generating electricity but nothing of consequence. Years passed with Kota being referred to as an industrial town, with no other way to describe it and no significant developments taking place either. For years people ignored Kota as almost a non entity in Rajasthan. Somewhere in the early 1990s some significant industries had to be shut under duress and that started the decline of Kota. People in large numbers lost their jobs and the economy of the town was almost in a crunch and probably that was the point in time that propelled Kota into realms of history. A few go getters grabbed the opportunity, took the initiative and set upon a path that heralded a new era in the history of Kota as well as India. Minor coaching centres started off in the nooks and corners of Kota attracting students in small numbers and trying to groom them well in the fields of sciences and maths thereby compensating for what their schools were not able to do. Sensing money, well educated professionals gradually jumped into this which brought about a great change in the way education was imparted. The field of sciences underwent a massive change with increasingly more number of students opting for sciences as a career and more number of coaching centres mushrooming all around the city. Though majority of them were just imparting some shoddy and spurious stuff in the name of education, they were still contributing a lot in the interest levels of students.

Massive Coaching Institutes like Allen Career Institute, Resonance, Motion IIT-JEE, Vibrant, Soni Classes, Kavya Classes, Yuva classes to name a few are the ones who have developed their network over the years and are now attracting students from across the country for preparation of various competitive exams and in the process churning huge profits. A recent issue of **The Times of India** quoted the Coaching business in Kota to be worth somewhere around 300 Crores annually<sup>2</sup>. With the passage of time, there was practically no corner of Kota untouched by these institutes. These institutes have touched a new high with majority of them developing into such big names that they have started recruiting the best of professionals from across the length and breadth of India. Professionals like engineers, doctors have started opting for a teaching career instead of going for their field of specialisation and the kind of money this business is spinning, it's anybody's guess how much these teachers are minting out of these ventures. Over the years, Kota has turned into an educational hub and has grown with such a rapid pace that students from across the country, have started converging upon the town with the sole purpose of making it big at the competitive exams. The reputation of the town has extended far and wide and Kota has gradually developed into a destination which promises people the best of careers for their children. It's not just the academic credential that has got a boost, in fact it's the whole system that has changed. There have been incredible changes in the face of the town and it's all on account of certain very much visible factors :

### **1.1.3 INFRASTRUCTURE**

These coaching giants have brought about an unbelievable change in almost everything that could be talked about Kota. New flyovers have come up, multi-storeyed apartments are being erected almost in every conceivable nook of Kota, malls and cineplexes are a norm in Kota now and it's all thanks to the massive upheaval that Kota has undergone. Colonies have shaped up out of wilderness and as a result builders have been the major beneficiaries. It would seem practically unimaginable to think of train routes and major trains being started to cater to the travelling needs of students shuttling in and out of Kota. Shopping complexes and

lands have been allocated to aspiring people to set up multi-speciality outlets to serve the students much better. A big influx of students has prompted the builders to develop localities which are being offered on prices that are not exactly sky high and very much manageable. People seem to be a lot interested in real estate as they all are undoubtedly eyeing the possibility of making money out of renting out the property to the large number of students descending upon Kota. A study published in one of the recent issues of **The Hindustan Times** quoted the real estate business in Kota to have grown multi fold in the last 5 years.<sup>3</sup>

#### **1.1.4 SERVICES :**

The same stands true for services too. By a rough estimate around 70,000 students from states far and wide visit Kota every academic year to be a part of certain famous institutes training the students to be into IITs and top medical colleges. Another 25000 students are said to arrive in Kota not to join the top institutes, rather they show their faith in teachers teaching individual subjects, thereby generating the need to have top services of all sectors like Banking, hotels, mess, restaurants, guest houses, cabs and autos.

#### **1.1.5 HOSTELS AND PAYING GUEST FACILITIES.**

Majority of these coaching institutes are concentrated in the areas which are a part of new Kota now, as such hostels have sprung up across the length and breadth of the town promising the best of facilities for the students at prices that by no means are nominal, though they can't exactly be called exorbitant but still are high enough for the middle class families to afford. It's not just the staying part that they cater to rather they offer a plethora of amenities that range from regular three course meals to laundry, even transportation if possible. The concept is ' a home away from home'. Residential localities adjoining the coaching institutes have transformed into hostels with local residents getting extra rooms constructed within their existing homes and letting them out to students for an year or two.

Around 1250 big and small hostels exist around the span of Kota as quoted in an article of a leading daily **Dainik Bhaskar**.<sup>4</sup> Besides many exclusive multi facility hostels have come up with air conditioned rooms, plush interiors, quality meals and also servants at their beck and call. There are hostels even offering regional food from varied parts of India which make them even more desirable for the ones who can afford it. But for middle class students who can't bear these expenses, ordinary paying guest houses with substandard facilities serve the purpose wonderfully well.

#### **1.1.6 MESS AND RESTAURANTS**

Since about a lakh students land in Kota every year, apart from boarding, food is an issue that becomes a problem for these youngsters. Majority of them prefer to eat at the messes being run at their paying guest facilities and boarding houses, some don't find the food to be as per their liking and keep switching from one mess to another. Quite naturally, the quality they are expecting at these messes doesn't fit their scheme of things, they find the food to be monotonous and soon get bored of the place where they have been eating for over a month. Restaurants and fast food joints soon compensate for this providing food that is of course a bit tastier than what is offered at the messes. Around 65 new fast food joints have opened up in the small locality of New Rajiv Gandhi Nagar in the last 2 years as quoted in one of the latest issues of **Rajasthan Patrika**<sup>1</sup>. Since this food is rich in oil and spices, it is not healthy to be consumed every day. For the youngsters getting to eat at the restaurants is real fun but it's very much heavy on the pockets. Most of these students have to survive on limited allowances provided by their parents and as such eating at food joints every day is an option they can't exercise with ease. The only option is to carry on with the messes where they have been eating for quite some time. Even at the messes, quality takes a beating as the ration being used is shoddy and of dubious standards. There is always a suspicion it might be adulterated too. Majority of the students living in hostels have to rely on the food offered by these facilities and thereby they are greatly exposed to the risk of contracting some or other intestinal infections.

### **1.1.7 TRANSPORTATION**

Another major upheaval has been in the field of transportation, whether it be trains, buses or cabs. Through recent railway legislations, certain major trains have Kota on their routes now and many new trains have been announced to be launched soon charting their routes through Kota. Same is the case with inter-city buses. Private operators have started off air conditioned buses to and from Kota connecting major cities and towns of India so as to facilitate the movement of students in and out of Kota. It is all thanks to the quality education this city is imparting, that these incredible changes have come about. A city that was sleepy enough to have just auto rickshaws plying on the roads twenty years back can now boast of major cab operators like 'Ola' and 'Taxi for sure' running their services and making good money out of this town. In a nutshell, life has taken a turn for the better as far as road and rail connectivity is concerned. A town that was long neglected on the map is now a hot spot in Rajasthan.

### **1.1.8 BANKING :**

Major banks have found Kota an attractive destination to set up their base as an entry of almost a little more than one lac students impacts and expands the economy thereby creating a need to have top financial institutions to maneuver the changing needs of an upcoming town. Students coming from states out of Rajasthan need to open their accounts so as to have some crunch funds available at all times as they have to pay everyday for their day to day needs. Also banking needs like getting a draft made, small fund transfers, ATMs have become more feasible with the presence of so many banks. Parents of students who either accompany them or send money via CBS find it pretty much facile to transfer funds to their wards through an abundance of these services. The coaching industry is estimated to be a 300 crore industry ( as quoted by **KOTA PLUS**, a supplement of **The Times of India**<sup>2</sup>, in one of its recent issues, the figure quoted simply being the revenues collected in terms of tuition fees quite apart from the earnings of added facilities like boarding and lodging.

### **1.1.8 HOTELS**

Around a couple of decades back hotels in Kota were a rarity. For a span of kilometres, there were just a few and far between with hardly a few entries a month. As coaching institutes prospered in Kota, the hotel industry boomed. In areas like Dadabari, Talwandi and Mahaveer Nagar which are the peripheries of Kota and were sparsely inhabited for years, hotels and guest houses mushroomed and paying guest facilities came up overnight to accommodate the ever growing number of parents arriving in Kota with their wards. A hotel industry that was not even worth a few crores about two decades back blossomed into a business worth 150 crores an annum by recent estimates (as quoted in **The Times of India** in an article published recently). It's now pretty much convenient for the parents to visit the town and stay at these hotels while they get to admit their children in one of these institutes. Thereby an industry that wasn't there at all to start with progressed with leaps and bounds.

### **1.1.9 RETAIL STORES AND OUTLETS**

This major influx of over a Lakh students every year has quite naturally led to entrepreneurs and self-employed people to set up retail stores catering to the day to day needs of students like fruits, milk, wafers, cold drinks, mobile recharges, common snacks and other odds and ends. There is such an abundance of these shops in certain congested regions of Kota that it seems almost unavoidable to miss their presence and importance. It wouldn't be an overstatement to say that many unemployed youth have found a suitable employment as a result of this gradual influx of students over the years. These retail stores could be found almost in every possible nook of Kota selling almost everything from pens, pencils and notebooks to edibles like wafers, chocolates and milk. This retail industry serving almost all the needs of students has grown multi-fold over the last decade and is now a flourishing business. Though there is no exact figure to validate how much is this retail industry actually worth but the kind of crowd they are pulling and the volume of business they are generating are enough indicators of their growing

stature. These retail stores double up as confectioners as they sell bakery, milk products, patties and samosas. Almost any product that is of routine consequence is available at these stores like soaps, shampoos, perfumes, mouthwash, toothpaste, shaving creams and almost anything that could be clubbed under toiletries. It's not just that, these retail outlets even sell note books, registers, pens, pencils, erasers and almost all the stationery products that the students are in a regular need of. In fact the way these shops have spread in number, there is no residential area that is bereft of them. Every single lane, every solitary corner could boast of three to four retail stores pulling almost an equal crowd amongst the students.

#### **1.1.10 SHOPPING MALLS AND COMPLEXES**

The retail market has boomed to such an extent that the students staying in hostels don't have to bother much as far as their routine needs and demands are concerned. They get to see retail stores everywhere ready to cater to whatever they want. Apart from these stores, the whole concept of market in Kota has undergone a sea change. Massive malls and shopping complexes have come up with major brands in shoes, outfits, dress material and accessories vying for attention. Gigantic shopping complexes housing brands like Nike, Adidas, Levi Strauss and Van heusen are attracting students in hordes. It's all thanks to the huge crowd of students converging upon Kota every year. These brands have descended upon Kota with implicit knowledge that Kota is now a home to one lac new students every year coming from almost all the parts of India, some of them from very affluent families who could easily afford these brands. All in all the economy has expanded beyond the seams. A town that about a couple of decades back was humble enough to be called poor is now one amongst the small rich towns of India with a home grown economy. It's not just the field of garments and footwear where multinational brands have entered Kota, same stands true for edibles as well. Major brands like McDonald's, Domino's and Baskin Robins to name a few have their outlets and franchisees jostling for space. It's common knowledge that despite being just a town in the south east of Rajasthan, far away

from the rich and elite of the country, this town is creating waves across the world. These coaching institutes have made Kota what it was not to be. Twenty years back, when this coaching industry was still in its infancy, nobody had even thought it would grow such phenomenally. The multinational brands that are now household names in Kota were pretty much inconceivable that long back, it's the exponential growth of Kota in the field of coaching that has brought about this significant turnaround.

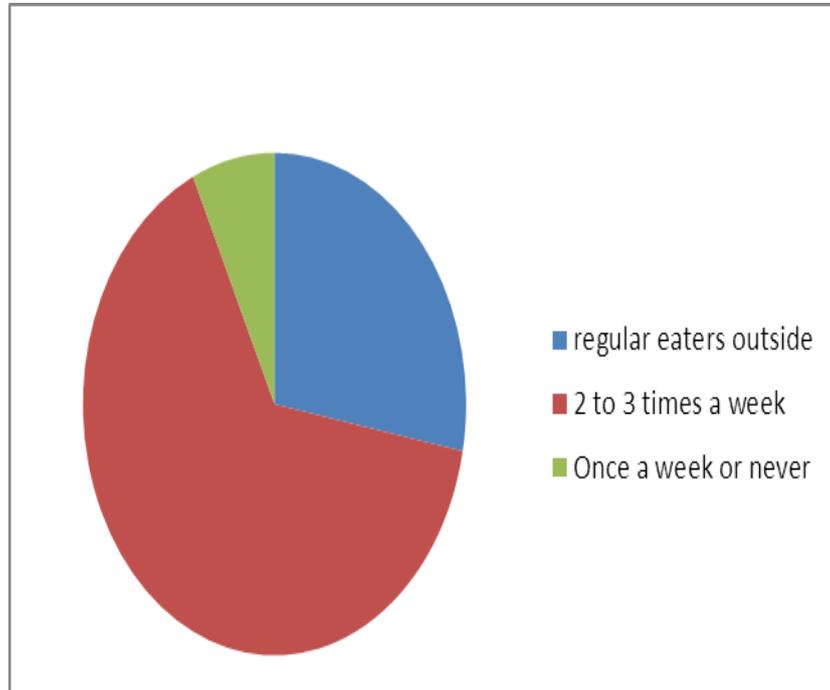
#### **1.1.11 EATING BEHAVIOUR AND PRACTICES AT KOTA**

Amongst the students arriving Kota, there is a major chunk of girls for whom it is once in a lifetime experience staying away from their parents and they get an opportunity to make the most out of it. The study undertaken is a massive insight into the dietary needs, patterns and nutritional shortfalls that young girls experience as they are subjected to a life away from home, free to eat what they wish to quite far away from the over-protective and prying presence of parents. Though life for them in a hostel is not easy but it has its own thrills and adventures that can only be experienced without a semblance of parental guidance which is often construed as interference. Though this liberty comes with its own set of disadvantages, it carries a sense of being on one's own, which in itself is a premium rather than being watched constantly and being painfully directed every now and then. Since the study has been conducted in and around the city of Kota, it deems fit to talk a bit elaborately about the city, the travails of being in Kota as a student, the experiences it offers and the dietary habits that a student picks as a result of being alone and unwatched.

It is independence experienced best without anybody breathing down their necks. They can study at will, hang around with friends, get to know students from far and wide belonging to states where they have never been. Moreover, they get to eat food as exotic as it could be thereby breaking away from the monotonous routines that they have got so much used to. With parents they are mostly offered food that is exclusive to the region but away from parents, they get an opportunity

to consume cuisines they have never even heard of. Though it's an experience that exhilarates them beyond limits, it may even wreak havoc upon their health. The messes at which they normally eat, offer food that lacks nutrition as it is prepared out of substandard stuff and may even be unhygienic to a large extent as it's usually prepared in filth and squalor. Further, little or no attention is paid to the nutritive value of the food being served to these young girls as seasonal and fresh vegetables, quality pulses and grains are casually ignored and what ultimately comes in front is not worth consuming for these growing adolescents. As beautifully quoted by **B.Srilakshmi<sup>5</sup> in her book DIETETICS that gained eminence amongst nutritionists.** "The period of transition from childhood to adulthood is called adolescence with accelerated physical, biochemical and emotional development. It is during this period that the final growth spurt occurs." This normally is a phase punctuated with a nature that is wild and experimenting. These young girls try to explore a world quite different from their own. And food is one of the best means to experiment a culture that's different. Since they don't usually love what's being offered to them at their hostels, they take time out to visit food joints at different corners in the city where they get to eat junk that they love the most. Burgers, pizzas and pastas are their favourites when it comes to eating out. Though, they can't afford to have these things every day, they don't miss out on any opportunity that they get to eat this stuff.

During the course of pilot study, an interesting statistic sprang up on a casual chat with students and roadside vendors in an area of Kota infested with hostels. A rough and vague pie might represent the common opinion amongst the masses occupying the areas surrounding majority girls' hostels.



**Fig. : 1.2 graph depicting percentage breakup of girls eating outside**

Around 28% of the girls living in hostels are regular eaters outside as they find the food available at hostels pretty much boring and monotonous and as such eating outside at fast food joints seems to be the only option present. 65% of these adolescent girls eat two to three times a week for a change as and when food available at the mess is boring and the remaining 7% may eat out once or never. Though it's a rough statistic, it gives a fair glimpse about the nutritional status of these girls. In fact they know well it's not healthy for them but definitely it's tastier than what they routinely eat. Some of these adolescents even get addicted to fast food and make it a part of their routine as a result of which they suffer to a large extent. These adolescents get habitual of a unique pattern of eating. Rather than going for the morose food that they are normally offered, they skip their meals and start satiating their hunger with snacks that are usually high on sugar and fat contents and have considerably low quantities of protein which should actually be the other way round. Sugar is known to have deleterious effects if taken in large quantities for a long while. A recent article in **The Times of India**<sup>2</sup> quoted Dr.Selena Bartlett from Queensland University of Technology stating that “ Excess sugar consumption has been proven to contribute directly to weight gain” It's even worse sometimes when they totally skip their meals and develop a habit of staying hungry which has even more far reaching manifestations. Sometimes, they even substitute their meals altogether with soft drinks which contain too much of sugar and empty calories which are downright harmful. There are even cases where these adolescents start depending totally on fat rich snacks and totally give up consumption of normal meals, which in a way means depriving oneself of healthy vegetables, pulses which are a rich source of proteins and vitamins.

## **1.2 NUTRITIONAL STATUS OF ADOLESCENTS**

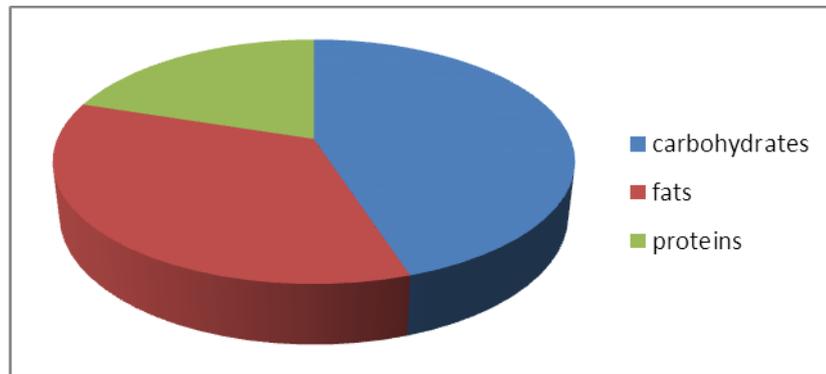
Most of these adolescents have a weird nutritional status and are more influenced by peers than by any wise counsel. Their choice of food is dictated more by extrinsic factors like their looks and friends' opinions. They are least bothered about the nutritional value of what they consume. For these adolescent girls, their

looks carry a lot of weight and this compels them to distort their eating habits. They alter their food at their own whims and live in a misconception that it would boost the way they look. This is an age when their metabolic demands progress by the day as a result of which their calorific needs increase too and if they don't take regular nutritious meals, they compensate for the lack of proper diet by having dead junk like Burgers, pizzas, chocolates and wafers which are too high on lethal fats. **In a recent study quoted in TIME magazine<sup>6</sup>** in one of its latest issues, chocolates have been described to be a major health deterrent ( Around 20grams of chocolate is consumed on an average by adolescent girls across the world). The eating habits in most of these girls are more a result of psychological factors than physiological ones. Social pressures force the girls to design their diets so as to look good. There are a few more factors that affect a girl's nutritional status. Like the odd hours she has to attend her classes which deprive her of consuming a proper meal when she needs it the most. Some girls are brought up with a habit of early morning breakfast but staying at the hostel, she has to contend herself without a breakfast as getting a breakfast that early is sometimes not possible at a hostel. This may impact a girl's life severely as an early morning breakfast supplies her with adequate energy to keep attentive and agile across the day. The whole process of metabolism is time dependent and a minor change in the time the meal is provided may impact an adolescent's life adversely. Majority of these girls are found to be eating either too less or sometimes too much. It's rare to find a case that is balanced. This irrational and ill-scheduled eating pattern may cause the girls to suffer many problems and they even pick digestive imbalances which are hard to rectify if they carry on for a long while. Some girls have to seriously alter their life styles as what they have been normally eating for years, they don't get that while at hostels. Sometimes they even get accustomed to eating food that is too much spicy as it seems to be more satiating but may cause irreparable losses to their digestive tracts.

### 1.2.1 MACRONUTRIENTS

Since these adolescents are in an age where their eating habits are the most erratic, it can be safely concluded that what they eat is absolutely imbalanced and poorly scheduled because of the plain lack of timely parental intervention. Punctuality in consumption of meals is not just the only thing lacking, it is also the lack of balance that's found in the relative proportion of nutrients they consume. Almost all important nutrients are either grossly misplaced or not present at all and certain other nutrients which are hardly required beyond a quantity are excessively there. This lack of proportion is very much visible in the symptoms of ailments they suffer as a result thereafter. If we talk in terms of the macronutrients like the carbohydrates, the fats and the proteins, these are found to be inadequately proportioned in these adolescents, which leads them to bear harmful consequences. As it's such rightly quoted by eminent Nutritionists and authors **Sukhneet Suri and Anita Malhotra**<sup>7</sup> in their best seller "Food Science, Nutrition and Safety" published by Pearson, "Dietary errors related to choice of food and hence Macronutrients can spoil health adversely. Therefore knowledge about macronutrients is essential to remain healthy and prevent the development of diseases." The gist of what the authors have wanted to say is that right choices in terms of these vital nutrients lay the foundation for a long term health of individuals. Carbohydrates, fats and proteins form the bulk of the diet we consume in a day. To a large extent the structure or the framework of our body depends on the proportion of macronutrients. Like whether a body is lean, bulky or artistically muscular depends substantially on the amount of macronutrients present in our diet. Carbohydrates should ideally comprise 45% of our total energy intake in a day and an adolescent may feel exhausted if there is a profound deficiency of this nutrient as carbohydrates work as a fuel for a body. Majority of what we do in a day like running, reading and walking is all fuelled by carbohydrates. Fats to be sure are present in a bulk in the oils that we consume on a regular basis and are the most delicious chunk of what we eat in a day. They should be consumed in moderation. Fats should ideally partake 35% of our total intake of calories. Further, Proteins should ideally comprise 20% of our total

intake of energy. Our body synthesises proteins from amino acids and helps us in the prime functions of our body.



**Fig. : 1.3 percentage breakup of nutrients as required ideally**

#### **A. CARBOHYDRATES**

Carbohydrates can be called the principal element of our diet as a result of which they control our health to a large extent. For an adolescent, carbohydrates are a key to whatever energy she requires to keep going. All sugar and starch rich foods carry carbohydrates. Though foods like cereals contain carbohydrates, but they also contain fats and proteins. Sugar and honey can be termed as foods which contain pure carbohydrates and no other nutrients on account of which they are termed as empty calories. Consumption of sugar to a large extent can be considered safe for adolescents as they require extra energy and because of their active life, it proves to be pretty much helpful. For sportspersons, carbohydrates carry an edge of relevance.

Carbohydrate rich food is especially valuable as a breakfast as it facilitates better performance at work and enhanced efficacy. It also promotes cognitive performance and helps these adolescents to stay alert during classes. Most of the carbohydrate rich foods contain excessive fiber which to a great extent is helpful in preventing constipation and obesity but the reverse is also true. Fibers absorb water and excessive consumption of fibers may prove to be a bit harmful. Quite

likely, too much of sugar can boost energy but may cause obesity as starch takes longer to metabolize. Sugars can either be classified as monosaccharides or disaccharides. It is conveniently easier for the body to metabolise sugar and as such sugars are usually put under the category of simple carbohydrates. It's considered much easier to digest and metabolise simple carbohydrates as starch as it burns much faster and lends the adolescent the energy she requires to rush about. Further, even fruits, vegetables and whole grains have carbohydrates which are much tougher to metabolise and hence they are termed as complex carbohydrates. Since most of the carbohydrates are fibrous in nature, they absorb water and lots of digestive juices thereby procrastinating the emptying of stomach which also leads to the feeling of fullness. This quite genuinely results in excessive consumption of water which is quite helpful in the excretion of toxins. Moreover, starches and sugars metabolise very fast and these adolescents feel hungry much earlier. It's medically proven that carbohydrates are the best possible meal for a youngster in adolescence as it works wonders for the cognitive skills of a student and are known to develop central nervous system.

## **B. FATS**

Fats are considered to be the most delicious element of our everyday meals but have a lot of negative publicity attached to them. People often consume fats with a bit of anxiety as they have heard lots of stories about the negative consequences of fats on a human body but for the growing adolescents fats have a serious role to play. Naturally, they are an important part of an adolescent's diet as the role of oil in making the food tasty can't be denied. SATURATED fats have been long recognised as harmful ones as they shoot up the blood cholesterol levels, and if they are being consumed with regularity, they may make these adolescents quite prone to coronary heart diseases. As reported by nutritionists, these saturated fats are known to exist in chocolates and meats and should be consumed moderately. The UNSATURATED fats are reported to be the safer ones which metabolise a little faster and synthesise quite easily. They have never been associated with cholesterol as they break down pretty fast and are known to exist in olive and

canola oils. Further, fatty acids can be classified into essential as well as non-essential. The essential fatty acids are the ones that are found in oils and help in keeping the blood vessels semi-permeable and also aid in controlling sweat in the summers. It is also essential in keeping skin diseases in a tight check. The non essential fatty acids are the ones that contribute practically nothing towards the betterment of the body, they are the ones that settle into our arteries in the form of cholesterol and have a devastating impact on our blood circulation. Though, these adolescents are pretty young and are not threatened by any such coronary heart diseases but if these habits linger on, they may gradually aggrandize themselves and become incurable.

### **C. PROTEINS**

Proteins are the building blocks of our body and provide a certain frame to our body. Proteins are basically synthesised by our body from amino acids and they primarily perform the function of generating new cells in our body. Thereby the overall size and strength of our body depends on the quality of proteins we are consuming to a large extent. Proteins are known to repair bodily damages. When we are badly bruised or wounded in accidents, we find that the scars and injuries don't last long. It's all because of proteins available in adequate measure. New cells get created because of proteins and help us to get over those injuries and scars. Proteins are also famous as well as infamous as Body mass builders as they play a constructive role in strengthening the muscles of our body which may sometimes lead the youngsters to consume artificial proteins which may backfire. The best possible known sources of proteins are eggs, milk, all milk products like curd and cheese. Since these adolescents are staying away from their parents, there is nobody to inspire them to go for a glass of milk everyday as a result of which they miss out on a complete source of protein. Even meat is considered to be a complete protein but since majority Indian diets are centered around vegetarianism, these young girls can compensate for the lack of this by going for pulses and legumes. Since, for the adolescents, it's an age when they gain height and weight, develop intelligence, and strengthen their body frames, proteins are a

significant food source as they help an adolescent to build up a frame and develop an immunity which goes a long way in preventing them from contracting unwanted ailments. All in all it's common knowledge that high protein diets are supposed to be avoided in a routine course as excessive proteins are not required as they may put an added pressure on the kidneys to perform and in the long run, it may even result in a renal failure. Thus, these adolescents need a beautifully balanced diet which has all the macronutrients in a perfect proportion as living alone in a city far away from parents is a challenge for which they need to be physically as well as mentally prepared and a finely balanced diet may be one of the right elements to put things in order.

### **1.2.2 MICRONUTRIENTS**

Almost equally important is the role of micronutrients in keeping the adolescents agile and fit. Micronutrients, as is common knowledge, are broadly classified into Vitamins, Minerals and Water. All these three components are almost equally important for the stable growth of an adolescent. Vitamins can be called the most vital amongst listed micronutrients. They have been rightly described as the key to a quality life for these youngsters.

#### **A. VITAMINS**

Vitamins are the predominant element in the overall course of meals that a person consumes in a day. They have been categorized based on many criteria. The most prominent one is the classification of vitamins on the basis of their solubility in water or fats. The fat-soluble vitamins like A, D, E and K are found in foods along with fats, they co-exist with fats and hence their importance gets a bit diminished. On the other hand water-soluble vitamins like B and C get easily dissolved in water and are considered to be having an edge over fat-soluble vitamins. Irrespective of the category of the vitamin, it performs certain unprecedented functions like it helps in converting carbohydrates and fats into energy, which

carries a lot of relevance in the case of adolescents as their overall intake of carbohydrates and fats is readily converted into usable energy which helps in the overall process of metabolism. Since the energy the adolescents require across the day to rush about their routine is far larger than what is required by other age groups, it gets necessary for them to consume vitamins in the right amounts. Further, Vitamins are known to be a helpful factor in the formation of bones and teeth. These adolescents have a serious lack of quality guidance and whatever they consume is simply out of their own whims. Normally what they eat out is devoid of vitamins which make them suffer a lot in the long haul.

Water-soluble vitamins have been found to be a lot healthier than fat-soluble vitamins since they get excreted much easily and as such the possibility of toxins getting stored gets reduced to a large extent. On the contrary fat-soluble vitamins get stored much easily and are thereby considered dangerous for human body. For these adolescents, the consumption of water soluble vitamins like B and C becomes an imperative as it decides the overall quality of meal consumption. Green leafy vegetables contain maximum vitamins, in fact several times more than pulses and cereals. This specially stands true for all the seasonal vegetables that contain vitamins B and C in abundance. Adolescents in the habit of consuming green vegetables everyday are found to be free of minor ailments afflicting others who don't consume it. As it's elegantly quoted by **Sukhneet Suri and Anita Malhotra**<sup>7</sup> in their best seller 'Food science, nutrition and safety' ('Vitamins are organic essential nutrients required in small amounts to perform specific functions that result in survival, maintenance, growth and reproduction of the body'). Vitamins can be classified also on the basis of the role they perform in a human body :

**VITAMIN A** : it's a fat soluble vitamin and is known to perform several significant functions. Like for these adolescents their vision plays an important role in deciding the quality of life they get to live. Vitamin A is a key vitamin present in the retina of the eyes and enables the eyes in differentiating colours, it also helps the eyes to adapt well to the darkness. Further, Vitamin A enhances the

reproductive health in both men and women. It's Vitamin A only that improves the health of bones. It aids the bones in growing stronger and faster and as such these adolescent girls can't afford to be deficient in Vitamin A. The same vitamin A builds the overall immune system of the body and makes the body infection resistant. A deficiency in this vitamin exposes the body to the risk of contracting infections of various kinds. Moreover it's the only vitamin that protects the skin from the deleterious effects of ultraviolet radiations and hence it's associated with all the beauty products. Dairy products like cheese and butter and meats like chicken and fish are rich sources of Vitamin A. Fruits like mangoes, oranges and papaya and also carrots and tomato are considered to be good sources of Vitamin A. Thereby it becomes almost mandatory for these adolescent girls to consume vitamin A in a good measure so as to keep fit.

**Vitamin D:** Body requires sunlight to synthesise this vitamin, it doesn't mean too much exposure to sunlight makes a body rich at Vitamin D, still a substantial amount of sunlight is required for the body to be good at Vitamin D. It's overall good for the bones and the nervous system and a deficiency in this vitamin may expose an adolescent to the threat of picking skin diseases. As is common knowledge that Vitamin D is a fat-soluble vitamin and can remain stored in a human body. In the case of these youngsters, a deficiency of vitamin D is known to cause rickets or a distortion of bones.

**Vitamin E:** It is again a fat-soluble vitamin and is excessively present in egg yolk, green plants, meat and vegetable oils like soya bean. Since these are the common foods consumed by most of the adolescents, it's difficult to find any youngster deficient at Vitamin E. The best possible role that could be attributed to Vitamin E is that it's an antioxidant and prevents the oxidation of unsaturated fats which are beneficial to a human body. It also prevents the formation of peroxides which are known to have detrimental effects on a human. A deficiency of Vitamin E in these adolescents results in an increased urinary excretion of keratin which is

an indication of muscle damage. The only positive about Vitamin E is that it's a bit non-toxic as compared to Vitamins A and D. This clearly reflects the fact that if the food is dehydrated, it loses Vitamin E quite naturally because of its specific role as an antioxidant.

**Vitamin K :** It's a vitamin that plays a unique role in a human's life and as such carries a lot of weight in an adolescent's life. It is associated with the prevention of blood clotting, large amounts of Vitamin K ensure that the blood clots faster. It's found in substantial amounts in dark green leafy vegetables, legumes, fish and various oils. It's also found in cucumber. Though no additional sources of Vitamin K are required in a human body as certain helpful bacteria develop it through a natural process, still its role in an adolescent's life can't be ruled out. Since it helps in forming blood clots, in young girls, lack of Vitamin K may spell a serious trouble during their menstrual cycles and also if they get injured. A natural diet with lots of salad ensures a human never faces any deficiency in Vitamin K. Somehow, remotely Vitamin K is also associated with good and measured amounts of Bone Mineral Density ( BMD ).

**WATER SOLUBLE VITAMINS:** Vitamin B and Vitamin C are soluble in water and not in fats.

**VITAMIN B:** All B-group Vitamins are considered to be energy providers though it's just a myth, the reality is simply that these B group vitamins help in utilising the energy provided by macronutrients like carbohydrates, proteins and fats. Majority of B group vitamins are found in small intestines. Vitamin B, in fact acts as a coenzyme, which means there are some enzymes which can't execute their jobs in the absence of vitamin B. Adolescents have to be particularly careful as vitamin B is never found stored in a human body, it has to be consumed in small gradual amounts through food. Vitamin B1 is abundantly found in pulses,

beans and peas. Thiamine (Vitamin B1) is also found in poultry, eggs, milk, fish and is readily soluble in water. It is the least stable Vitamin and easily gets lost in cooking, baking and processing and thereby the adolescents who are excessively in the habit of eating roadside food miss out on ample dosages of Vitamin B1 as such food is usually overcooked in the same oil time and again there depriving it of thiamine. The deficiency of Vitamin B causes fatigue, emotional instability and depression. Lack of Vitamin B1 is also associated with Beri Beri which is commonly characterized with cardiovascular, neurological and gastrointestinal disturbances.

### **VITAMIN B12 :**

This is one more important B group vitamin that characterises the vitamins and their relevance to the overall growth and betterment of an adolescent's life. This vitamin is again a water soluble one and depends a lot on a healthy dietary intake for its sustenance in human body. A simple drawback with this vitamin is that it's not generated naturally in a human body rather its levels have to be artificially sustained. It's found in large amounts in beef liver, chicken liver, fish, milk, meat and cereals. A balanced diet on a routine helps sustaining adequate levels of Vitamin B12. A deficiency of Vitamin B12 is considered to be lethal as it leads to anaemia or a severe lack of RBCs in adolescents. A prolonged deficiency of Vitamin B12 can also lead to neuro degeneration, spinal degeneration and a gradual lack of sensation in lower limbs.

### **VITAMIN C :**

As is widely known, this vitamin is universally referred to as Ascorbic acid or 'fresh fruit vitamin' as the best sources of vitamin C are fresh fruits. Vitamin C has gained its reputation from the myriad functions it performs in a human body. For an adolescent, this vitamin is all the more significant because of the conducive properties it possesses. Vitamin C aids in the generation of Collagen which is a

kind of protein that acts as a glue in holding body cells together, thus making it all the more relevant in binding the cells of skin, bones and teeth. Further, vitamin C also helps in the absorption of minerals like iron and folic acid. For adolescents, the role of Vitamin C in fighting stress can't be ruled out. **As quoted by a WHO report published in New York Times<sup>8</sup>** in one of their recent issues, 'Around 7% of adolescent girls in the developing world between 13 to 18 years in age are consuming fruits and vegetables as recommended'. Under conditions of physical or emotional stress more amount of Vitamin C is required to cope up, it also helps in boosting the immunity as Vitamin C can prevent a body from contracting infections like cold and cough. Moreover, Vitamin C is also known for its role in healing wounds and injuries and is easily soluble in water. For adolescents staying away from parents, consuming vitamin C in adequate proportions holds key to a healthy life free from common infections and ailments.

## **B. MINERALS**

Minerals are those nutrients which play a crucial role in the overall stability of a human body. There are innumerable minerals found in a human with their functions varied enough to suit the complexity of a body. Based on their functions and to the extent they are imperative to the human body, they have been classified as either Macro or micro minerals. Like calcium, phosphorus, sulphur, potassium, chlorine, sodium and magnesium are the common macrominerals found in a body whereas iron, fluorine, zinc, copper, iodine and cobalt are the ones classified as microminerals because of their miniscule proportions present in body and also their restricted functions. A good knowledge of these minerals has been pretty much helpful in concluding what all minerals these adolescents are missing as a result of consuming certain meals. These minerals are the major constituents of bones and teeth in the body and regulate the metabolism of many enzymes.

**CALCIUM :** It is known to be the most abundantly found mineral in the body and is responsible for a strong skeletal frame. In fact our skeleton and bones

comprise 99% calcium of our body. It is said that Vitamin D, a large intake of protein and low fat contents in a human body enhance the absorption of Calcium. Likewise, lack of Vitamin D, high fat intake and emotional instability may result in a declined absorption of Calcium. Milk and various milk products are known to be the best sources of Calcium. Further nuts, molasses and Vitamin D too are considered rich in calcium. Deficiency of Vitamin D is known to cause rickets in young children. It's related to the deformity of bones and in the adults it causes osteomalacia. A severe ailment Osteoporosis which results in demineralization of bones, thinness and fragility of skeletal frame is also a result of lack of Calcium.

**PHOSPHORUS** : Very much like calcium, phosphorus too is an abundantly discovered mineral in a human body. A beautiful balance between the ratios of calcium and phosphorus in a body is vital to the growth of the body. The functions of phosphorus are almost similar to that of calcium as bones and teeth comprise a combination of calcium as well as phosphorus. Phosphorus is a major element of our skeletal frame. It is required for the release of energy from carbohydrates, proteins and fats and also helps in synthesising proteins. The best sources of phosphorus are milk products, meat, poultry, sea food and all protein rich diets. Deficiency of phosphorus is known to cause pain in the bones, loss of appetite and muscle weakness. This is an age when adolescents experience rapid growth in their bodies and as such require phosphorus and calcium in the right proportion to aid this growth.

**SODIUM** : It's a mineral that provides a great taste to our food and that's the reason why it adds to the appetite. Sodium is also the reason behind sweating as it stimulates sweat glands. It helps in regulating body fluids and that's the reason why adequate quantities of sodium are required to maintain water balance and thereby the blood pressure (BP) of the body. Sodium also facilitates nerve impulses between our brain and organs of the body and that's why these adolescents feel lethargic and wasted after sweating a lot. These adolescents are

very much used to consuming processed foods like salted wafers, nuts, pastas which contain excessive salt and salt is the major source of sodium in our diet. Though limited amounts of salt are fine for the retention of water in the body but too much of sodium increases blood volume and thereby results in hypertension or High a Blood Pressure. For these adolescents this overdose of salt in whatever they eat may prove to be disastrous in the days to come as their bodies adapt to over dosages of salt and as such become more prone to blood pressure disorders.

**IRON :** Iron is a trace element which means it's required in a very small but steady quantity in a human body. As far as adolescents are concerned, iron as a mineral has a tremendous importance for their overall well being. It's either present in their bodies in a functional form which means it helps as a catalyst in the process of oxidation or it's present in a storage form in organs like liver, bone marrow or spleen. Deficiency of iron is known to cause a reduction in haemoglobin concentration of blood which is medically known as anaemia. **As quoted by Lighterlife** (a London based organisation set up in 1996 to cure young girls of obesity) in a **British journal**<sup>9</sup> published in a recent issue, '46% of girls between 13 to 20 years of age have too little iron in their diet putting them at the risk of anaemia, lethargy and lack of energy'. Adolescent girls have to suffer anaemia more as a result of excessive blood loss during menstrual cycles, which means almost a major chunk of girls living in the hostels are anaemic. All the more because of the fact that the diets they are getting are severely deficient in iron. A regular diet rich in iron is crucial to a healthy life as it is one out of the key minerals playing a role in the composition of blood. Meats like liver and kidney are rich sources of iron. Further, eggs, pulses, nuts, dry fruits and green leafy vegetables too can be counted amongst the best sources of iron. For an adolescent a diet deficient in iron can be devastating as it may trigger a chain of disorders like anaemia resulting in weakness, lack of concentration and a constant feeling of nausea. **As quoted in a WHO report and published by N. Shakuntala Manay**<sup>10</sup> in her seminal piece "Foods, Facts and Principles" ( some 250 million women in

the developing world, in the age 15 to 49 are estimated to be suffering from iron-deficiency anaemia ).

**IODINE** : it's a trace mineral found in a minuscule quantity in a human body but performs a significant role. Almost the entire iodine content of a human is present in the Thyroid glands and helps in synthesising the thyroid hormones which control the body temperature, growth and reproduction in humans. In day to day life, iodine requirements of a human can be fulfilled through table salt as it is enough iodised to satiate the mandatory and unavoidable needs. Further, sea foods, sea weeds and fish are rich sources of iodine. Deficiency of iodine amongst adolescents may cause them a severe harm like lack of proper mental development, they may be found a little retarded, it may even lead to cases of goitre, hypothyroid or hyperthyroid amongst the adolescents.

**FLUORIDE** : It's again a trace element responsible for strengthening of teeth and bones. Fluoride has been identified to be a micro mineral, the quantity of which in water decides the health of bones and teeth in a human body. If it's within the safe limits it's a boon but a little beyond the limit may prove to be detrimental. Water is the best source of fluoride. Potatoes, legumes and tea are some other good sources. For adolescents staying away from parents, it's vital that this mineral is present in a good dosage as it helps them to keep bones and teeth in a healthy shape.

### **C. WATER:**

Water is one of those molecules that are abundantly available in a human body. It's medically proven that water comprises around 60% of total body weight in a normal individual; it may vary with age, body constitution and nature of individual's profession. As far as adolescents are concerned, water has a crucial role to play as these youngsters have a life that is absolutely volatile and far from

sedentary. Physical activity constitutes a major part of their day to day routine. They might not be into sports but they walk a lot as most of the girls living in hostels don't have personal vehicles and that's where water consumed by them plays a part. Water is not present in our bodies in the purest form rather it's present in an amalgamation with minerals and electrolytes. Water is considered to be a universal solvent as many other body fluids exist in the body in a dissolved state. In fact, fluids like glucose and amino acids get transported from one organ to another in a dissolved state with water. Certain important minerals can exist in our system in a dissolved state only and water is the only element in which they are perfectly soluble. Adequate quantity of water consumed ensures that the blood volume remains normal and the blood pressure is maintained across the body. Water also helps in regulating body temperature as it excretes water through the skin to maintain external temperature or retains water in the body to maintain internal temperature. Water keeps the metabolism and excretion of wastes in order. Lots of toxins are excreted out of the body through urine and these adolescents don't have to suffer constipation if their water intake is adequate.

Drinking water is the best source of water through which majority of our water needs are satiated. Fruits like water melons and mangoes and fresh salad comprising cucumbers, carrots and beet root may quench our routine water requirements. These adolescents might ignore the need to have lots of water on a regular basis and thereby suffer chronic constipations and occasional dehydrations in summers. Fresh water is all the more important as it consists of many important minerals like fluoride that are the reason behind the health of bones and teeth.

### **1.3. HEALTH PROBLEMS WITH ADOLESCENTS ARISING OUT OF LACK OF PROPER NUTRITION**

Staying alone without parents guarantees freedom beyond limits but it comes at a cost. These young girls have to go through a grind where sustaining a good health becomes a challenge. Unhygienic food, adulterated spices, stale flour and rotten vegetables make it difficult for the girls to stay fit. By the time they spend two years in Kota, they have either picked a chronic ailment or have developed an

infection that threatens to put their life in trouble. Most of the meals they consume at paying guest facilities, messes and roadside vendors are absolutely filthy and devoid of essential vitamins which gradually expose them to risk of developing either an infection or a deficiency of some essential nutrient having long term repercussions.

**Missing Breakfasts:** It's a fact that a lot of adolescent girls tend to pick a habit of skipping their breakfast as it is not to their liking and lacks taste which over a passage of time deprives them of carbohydrates mandatory to keep their body slogging. This makes them lethargic which ultimately shows in their performance at academics. Same stands true for erratic meals without a fixed schedule. Staying hungry for prolonged periods of time makes them suffer from acidity that may turn into peptic ulcers if not taken care of.

### **1.3.1 ANOREXIA NERVOSA**

Being adolescent girls they are a bit more concerned about their looks and being presentable and acceptable is a norm, which prompts the girls to go on crash diets so as to keep thin and charming. Peer pressure is one of the major reasons why girls give such a premium to looking thin and attractive. This may reduce their weight but more than that, it makes them malnourished which gradually comes hard on the quality of life they are living. Anorexia is associated with signs of dizziness and convulsions. Skipping their meals may be disastrous for mental health as well because concentrating on studies turns out to be pretty much tough without the right nutrients in order. As it was quite adequately quoted in one of the recent issues of '**The Hindu**'<sup>11</sup>, "Around 1/3<sup>rd</sup> of young girls between 13 to 19 years of age in urban India are languishing under self inflicted starvation which is causing some severe mental and physical traumas". Looking good being thin is acceptable to the extent that it doesn't hinder the normal routine of these girls but the moment it starts deteriorating their health, it gets irreversible. It may lead to weakness with its worst repercussions. Thus the idea of being anorexic hampers

the health of girls thereby rendering them incapable of discharging their duties which they are expected to.

### **1.3.2 OBESITY**

Girls staying alone find it difficult to keep a check on their routine meals like lunch and dinner and compensate for the lack of these by having junk. Deep fried Indian junk like samosas, kachoris and cholas are highly calorific and comprise saturated fats which are overall detrimental to their health. Even the oil used to cook them is hydrogenated to a large extent which ultimately spells disaster for their well being. Even western junk like pizzas, burgers and pastas consist of maida( finely ground flour) which is known to be harmful to the intestines. Too much of this stuff without regulation gradually accumulates and makes the girl obese. As per medically proven facts obesity is associated with hypertension and as such there are now several known cases of youngsters falling prey to disorders which are usually referred to as geriatric( old age) ailments. It may also lead to spasmodic backaches, irregular hormonal changes and in the long run, it may even throw the menstrual cycles out of order. Since legs have to carry extra kilos, they gradually develop arthritis, a disorder of bones. Even normal metabolism ceases to exist as the whole digestive mechanism has to work much harder to digest the food. As **B. Shrilakshmi**<sup>5</sup> has rightly quoted in her book 'Dietetics', 'Obesity invites disability, disease and premature death. Excess body weight is a hindrance to normal life'. Though adolescent girls are young, they are highly susceptible to cardiovascular diseases because of erratic blood pressures. Obesity may even cause gynaecological problems in the days to come and as such these girls have the added risk of falling a victim to pregnancy related deaths.

### **1.3.3 ANAEMIA**

Since a huge percentage of adolescent girls living in the hostels don't get to eat quality food rich in nutrients, they start lacking certain vital minerals like folic

acid and iron which are vital to the sustenance of RBCs in the blood stream. Folic acid is said to be found in abundance in green leafy vegetables, some pulses, tomatoes, oranges and livers of certain animals. It's common knowledge that staying alone without parents comes with its own disadvantages like these girls don't get to eat fruits and fresh vegetables which gradually makes them anaemic. As it was quoted quite convincingly in a recent issue of Outlook, "Anaemia as a disorder afflicts as many as 85% of the girls below the age of 20 in major cities and towns of India". Majority of their meals are either cooked in unhealthy hydrogenated oil, vegetables used are usually stale that have almost lost their nutritive value and there is little or no access to fruits or it may be that parents are not there to motivate them to go for fresh fruits. Anaemia may go chronic if it carries on for a while. Adolescent girls suffer due to lack of accessibility to quality meals as even the mess facilities where they eat don't serve them fresh green leafy vegetables which are a must in this age as they comprise major vitamins. This may impact their health adversely as by avoiding such vegetables, they are devoid of necessary roughage that keeps the bowels clean and imparts a feeling of agility and freshness. Further, adolescent girls don't get to eat balanced diet as a result of relying a lot on roadside food or junk like burgers and pizzas and this keeps them bereft of vitamin C which reduces their immunity thus exposing them to the risk of picking infections. Same stands true for vitamins crucial to the overall growth of human body like Vitamin B which is found missing in their regular meals as what they eat in routine is just substandard. Though it may not show up immediately as a symptom but in the long run, it may lead the girl to pick an ailment which might prove troublesome like hair fall and skin rashes which are attributed to the lack of vitamin B.

#### **1.3.4 ACNE**

Acne has been one of the major disorders that nag the adolescent girls to such an extent that it may even cause them to suffer severe depression in certain cases. As the famous women's magazine **Femina**<sup>12</sup> quoted an eminent dermatologist in a recent issue saying that, "Acne and pimples are not just a skin ailment; they are

more of a mental trauma afflicted upon young girls”. It is basically a problem of sebaceous glands that are found just underneath the derma and produce oil. These glands get clogged thereby often causing the hair follicle to get blocked which results in acne. Around 80% of adolescents across the world are known to suffer from acne. Acne may often be characterized as black heads and may even deteriorate into whiteheads that are often referred to as pimples. Commonly, hormonal disturbances during menstrual cycles and certain drugs are cited to be the reasons behind acne. Even certain lotions may result in acne. Though no such nutritional deficiency is considered to be the reason behind acne but a general impression asserts the fact that timely diets devoid of excess oil may control acne.

### **1.3.5 DIABETES**

Diabetes is a metabolic disorder and amongst the adolescent girls it may be a serious reason for trouble. Juvenile diabetes is a common medical malaise of today and is a result of human body failing to secrete insulin in the right proportion. Insulin oxidises glucose into energy and if there is a disorder in the ratio of insulin to bodyweight, it may progressively make the body susceptible to diabetes. As quoted in an **international journal, ‘American Diabetes Association’**<sup>13</sup> has claimed to have come across around 2,15,000 cases of diabetics below 20 in age in America itself. They are found to be suffering from type-1 diabetes which is common amongst adolescents. Even malnutrition is considered to be a reason behind diabetes. There are several factors which cause diabetes amongst the young girls living in a hostel as they are exposed to a diet which is imbalanced to a large extent. Thus controlling diet seems to be of prime importance for controlling blood sugar. Even emotional changes are found to be a reason behind diabetes. Obesity that results out of overeating may lead to diabetes in the longer run as obese girls more or less are found to be diabetics.

### **1.3.6 EYE AILMENTS**

Young girls in the age group 16 to 25 are equally vulnerable to several eye ailments as eyes are the most sensitive to any irritation caused. Amongst the youngsters, viewing of computer screen for a prolonged period of time and chatting and messaging on mobile screens may be one of the biggest reasons that plague the eyes sorely. Further, a deficiency of vitamin A is considered to be one amongst the major causes troubling the eyes. Weak eyesight is in fact a direct consequence of lack of vitamin A. Since majority of these girls don't get to have regular milk and milk products, it may lead to myopia or short sightedness or it may cause an aggravation of an existing disorder. Same is the case with vegetables. Most of adolescent girls don't get to consume vegetables like cauliflower which is a rich source of vitamin A. **'American Academy of Ophthalmology'**<sup>14</sup> and **'American Optometric Association'**<sup>15</sup> recently came up with a view blaming the excessive use of cosmetics by young girls. Cosmetics like mascara and eye shadows are known to cause dryness and allergy in eyes. Even eye liners, talcum powders and face creams may cause severe irritation of eyes.

### **1.3.7 IRREGULAR MENSTRUAL CYCLES**

Staying alone sometimes may even cause girls to suffer gynaecological problems like irregular menstrual cycles which to a large extent are a consequence of hormonal disorder. Iron deficiency is reported to be a known cause of irregular periods and since these girls don't get to eat nutritious food at hostels usually devoid of important minerals, they tend to pick serious deficiencies. A majority of girls suffer irregularity in their periods which sometimes may even hamper their normal lifestyles.

### **1.3.8 THYROID**

Thyroid is popularly known to be caused by a serious deficiency of iodine which often results out of lack of proper nutrition. Iodine is famously provided through

table salt which is found in our routine meals. Since adolescent girls are regularly exposed to substandard food, it may cause a severe deficiency of iodine which may further result in fatigue and weakness in the girls. Deficiency of iodine is also known to cause mental impairment if it prolongs over a period of time. If the hypo variant of thyroid carries on for a protracted period, it can also result in poor attention span of girls as they are not able to pay proper heed to their studies. A famous journal “**International journal of scientific research**”<sup>15</sup> quoted in one of its latest issues that around 130 countries around the world have serious iodine deficiencies found amongst young girls.

### **1.3.9 GROWTH RETARDATION**

Adolescence is an age when girls are supposed to grow the fastest and this growth can only be complemented by healthy dietary habits. Lack of vitamin A usually causes retardation in growth and a girl’s immunity gets affected. She gets even more prone to diseases of various sorts. One major reason behind this ailment is lack of consumption of seasonal fruits. Mangoes and even meat are known to contain vitamin A in excess and the consumption of these may help a girl keep away from common ailments.

### **1.3.10 WEAK BONES**

Living in a hostel and consuming food devoid of essential minerals may even lead the girls to suffer common ailments of bones. Calcium is one such mineral, the presence of which keeps the bones healthy and if the girls don’t get proper meals, they may start lacking calcium which makes their bones more susceptible to fractures. If the same shortage of calcium carries on for a while, it may even result in osteoporosis at a later age. Doctors commonly suggest a 1300mg of daily dosage of calcium for young girls between the age group 16 to 25 in age. The girls are suggested to go for 3 cups of milk a day to sustain optimum levels of calcium.

Even green leafy vegetables and soya are known to contain considerable quantities of calcium to keep bones of girls healthy and fit to sustain pressures.

### **1.3.11 TEETH CAVITIES**

Girls living in hostels often tend to suffer ailments of teeth because of lack of brushing habits. Since they are staying alone, they often miss out brushing their teeth on a regular basis which leads to cavities in their teeth. It also results out of poor dietary habits as the necessary vitamins vital to the health of gums and teeth are often found missing in the regular meals they get to eat at hostels and paying guest facilities. Further, lack of proper dental care might also be the reason why these girls suffer unhealthy teeth. As quoted in a famous international journal **“American journal of life sciences”**<sup>16</sup> in one of its latest issues, Hartford Hospital in the US is of the view that high sugar diet amongst the young girls is one of the major reasons causing cavities and toothaches. Their advice to the youngsters is to put a serious check upon sugar and soda diet so as to avoid ailments of teeth.

### **1.3.12 SKIN PROBLEMS**

A majority of girls living in hostels appear to be worried and troubled about some or other problem of skin. Diet plays a significant role in keeping the skin glowing and healthy. Since adolescent girls don't get to eat fruits on a regular basis and even their meals are erratic, this makes the girls deficient in certain vital nutrients thereby causing skin rashes. A balanced diet keeps all the nutrients in the right proportion which makes the skin healthy enough to avoid any skin ailment. Even hygiene matters when it comes to meals. Since food at messes and roadside vendors is deprived of hygiene, it exposes the girls to skin infections of several kinds which require timely medication and proper care.

### **1.3.13 GRAYISH HAIR**

As is well known, a diet that is deficient in vitamin B<sub>12</sub> may result in grayish hair. Amongst hostel living girls, diet is supposed to be a bit compromised in vital nutrients which may cause a lack of vitamin B<sub>12</sub> which further results in depletion in the production of melanin and that leads to the hair turning grey.

### **1.3.14 BACKACHE**

Girls often suffer severe backaches which are often a result of uneven postures while sitting or sleeping. Even an erratic diet lacking vitamins may cause severe spasms in the back. Sometimes, diet may even lack vital minerals like iron, calcium and potassium which help in strengthening the muscles and bones. This might lead to backaches and spasmodic pains in the spinal cord. It may be one of the reasons affecting their attendance at classes and their frequent visits to doctors. A balanced diet with a strict schedule with the right blend of vitamins and minerals may help the girls to a large extent in avoiding sudden backaches.

## **1.4 SIGNIFICANCE OF THE STUDY**

The study 'An educational intervention to study the nutritional status and dietary pattern of girls residing in hostels for coaching' has been undertaken with Kota as the selected research domain. Food can be rightly called a source of life as we all derive our energies out of what we eat. The process of metabolism, the meticulous synthesis of food which fires up the whole body and keeps it slogging for hours somehow depends on what we consume across the day. In fact the overall performance of the body, no matter what the chosen field of activity is, is a fair consequence of what we eat, how much we eat, the frequency with which we eat and how sustainable the diet is in terms of nutritive value and its long term impact on the health of subjects. As the chosen subjects are adolescent girls residing in hostels, the study assumes an extra air of significance given the girls' special role in the society today. Over the years government has assigned a unique status to

the girls in the society and their crucial role in the overall development of the society has been stressed and overstated time and again. Further, these girls are in the city with a mission, to get an Academic credo of some value which means a majority of them are downright serious about their studies and can't spare much time in activities that somehow distract them from their desired goals, which includes nagging and fussing about the kind of food they would like to eat on a given day. How they perform at their studies could also be attributed to the food they adopt on a routine. It may not be boastful to say that the food they consume could actually elevate their performance levels or may even seriously deteriorate their academic standing amongst the peers, still it could be safely assumed that the food they are having is somehow impacting the quality of life they are living. Education for girls and its significant role in uplifting the status of woman as a whole in the society has been asserted over the years and thereby the food they are consuming might actually gain a tremendous significance in deciding how they conduct themselves in the forthcoming years. The study further carries a lot of weight as girls have an added burden of bearing the progeny in the years to come which requires them to be healthy. Even the studies require the girls to be alert and agile which solely depends on the nutrients they intake. A lot also depends on the metabolism as it releases the energy vital to keep the body active enough to encounter the day to day challenges and this means the food should have the right mix of all the value added elements to keep the girls on their toes for as long as possible. The restaurants and the boarding facilities may not be providing them these vital nutrients pertinent to keep the body fit and as such the study assumes a lot of importance as it glosses the need for the girls to eat healthy. In a nutshell, the study carries a lot of value as nutrition has always been and will always be of prime importance for the overall academic as well as physical growth of the girls and specially because these girls are living out of their homes and the quality of food they are subjected to might be questionable to a certain extent. The food that is normally offered to them by paying guest facilities, restaurants, messes and roadside vendors is seriously unhygienic with substandard ration being used for preparation, spices used are spurious and even the oil is shoddy and is often so much reused that it loses its basic nature and gets hydrogenated to such an extent

that it starts causing serious health issues amongst the adolescents and becomes perilous to their health. The study conducted gains a vital importance in this context as these young adolescents have started experiencing ailments which normally are not associated with youth and are talked about only in the case of old age people. Most of the unbranded food items are adulterated and may cause a gradual and long term harm to the functioning of organs and may severely jeopardize the girl's life with life threatening diseases and may seriously afflict the girl with ailments which may become chronic and incurable with the passage of time. The study gathers relevance as lack of proper nutrition, over nutrition, adulterated food and the dearth of hygiene have been reported to be certain major reasons for the worsening health of adolescents. There might be a few more causes inflicting harm upon the girls' health but food lacking nutritive value seems to be the top in the heap. Moreover, these adolescents experience a turbulent lifestyle and that added up with erratic eating habits may result in a major setback that has the potential to throw the girl's life absolutely out of gear. All in all, this study has proved itself to be worthy of attention as the contemporary era is all about adolescents, their needs, desires, emotions, fantasies, and these all seem achievable if the youngster keeps a check on her health which can be inferred as being able to access food that proves the test of time, lives up to the dietary requirements and is a heady mix of taste and health. The study is all the more important keeping in mind the dietary distractions that these adolescent girls are subjected to. The kind of regular stuff that these girls get to eat may suit their palates for a while but proves to be devastating to their health in short as well as long term. This distraction in diet may give them an instantaneous gratification but when consumed spasmodically over an uninterrupted period of months and years, might inflict such a grievous harm to their mental as well as bodily frames that could actually prove to be irreversible. The loss is irretrievable and more so as it directly impacts the girls in the conduct of their normal routine.

## **1.5 CONTRIBUTION OF THE STUDY**

The study has contributed a lot in terms of generating an awakening regarding the crucial role food plays in the life of girls living away from parents and how the gathered data and analysis could be fruitfully used to bring to the fore the special nutritive needs that these adolescents miss and the ways these shortfalls could be compensated. Though the research has adequately exhibited the impact of an unhealthy diet on the day to day life of young girls staying away from parents, it has also done a lot to clarify the special dietary needs of girls, the nutrients they commonly miss in the food they consume and how these shortcomings could be made up for. The data generated during the process of study has worked wonders in glossing certain very important details regarding the thought process these girls go through while deciding upon a particular food, the priorities in terms of taste and nutrition and does it really matter to them that they are consuming something which might actually land them in a big pool of physical ailments which can severely hamper their mental growth as well. This contribution may not be the as important as it seems to be, but the major contribution is the revelation about the dietary patterns that majority of these girls are pursuing, it is a mind blowing exposure regarding the serious lack unhealthy diet and the drastic impact it may gradually cause on the life these girls are wishing to have in the days to come. Though their dietary status gets very much clear through the study, what remains to be seen is that whether the intervention has been successful enough in bringing about a nutritional makeover that the study has contemplated to achieve. The study can even be called an eye opener as it has busted many commonly held myths regarding diets amongst the young girls, it is educative enough to the point that it proves beyond doubt that nutrition has the potential to either build or completely disrupt the normal course of life that a girl requires for a healthy future and what actually goes into making a diet completely safe, hygienic and worth the money being spent on it. The study has gone further to the extent of elucidating the elements of a healthy diet and the factors that could be deemed crucial in making a diet worthwhile. The study has further contributed a lot in highlighting the need for the girls to be aware of what they consume outside as much of what they eat is unregulated, has no credibility whatsoever regarding quality and may

contain preservatives and other adulterants that could prove to be detrimental in the long run. The Study has significantly contributed in making it amply clear that nutrition has to be controlled when it comes to adolescents as this is the age when they grow at a rapid fire pace and they need a fair mix of all the vital nutrients to keep them fit and growing. This is the age when there is a phenomenal expansion of their creative and analytical faculties and if they are lucky enough to get a diet that is conducive to their mental health, they are bound to come out with flying colours. The study has thrown up a rich data pertaining to certain covert dietary needs of girls that may seem irrelevant superficially but when delved deeper these needs are found to be almost as vital as any regular meal. Especially when these girls are on their own without much sense of guidance around them, they tend to pick an erratic pattern of eating which gradually erodes the foundation of their health and may even make them vulnerable to ailments of all sorts. As such the overall contribution of the study in terms of highlighting the true nutritional status of girls living in hostels and the status that should ideally be there can't be ruled out keeping in view the fact that nutrition is the only factor that makes it possible for these girls to have a balanced life that could be sustained over a protracted period.

## **STATEMENT OF THE STUDY**

**“An educational intervention to study nutritional status and dietary pattern of girls residing in hostels for coaching (*With special reference to Kota city*).”**

### **1.6 OBJECTIVES OF THE RESEARCH WORK**

The research work has been undertaken with certain planned objectives which seem to be the driving factors behind making the research quite simplified in its approach. As far as the objectives are concerned, they have been chosen with a fair degree of premeditation. Since the study is centered around girls residing in the hostels of Kota, it's pretty much clear that the objectives have been chosen keeping in mind the existing conditions of demography, culture, fooding habits,

emerging trends, consciousness about health in young girls and how in the long term it might affect the fragile health of these adolescents. The objectives have been elaborated in a sequence so as to make them adequately clear and free from any possible clouding or overlapping that might occur as a result of cluttering too many details back to back. The idea of narrating the objectives in a sequence may also be a bit helpful in analyzing the results and reaching a conclusion as matching the predetermined objectives against the results would automatically overrule the risk of misinterpreting the results.

1. “To study the perceptions of diet, attitude towards food, eating habits, family meals and food preferences to gain an insight into the eating behavior and practices”
2. “To study relationship between dietary pattern and family background of girls residing in hostels for coaching”
3. “To assess the level of knowledge girls have on nutrition and nutritional needs for maintaining good health.”
4. “To determine consumption of diet with different proportions of macronutrients and micronutrients that help in contributing energy.”
5. “To identify the health problems in girls residing in hostels for coaching due to lack of nutritious food.”
6. “To identify the factors affecting weight management of girls residing in hostels for coaching.”
7. “To plan an intervention to improve the nutritional status by educating the girls residing in hostels for coaching.”

## **1.7 RATIONALE FOR CHOOSING THE ABOVE OBJECTIVES**

### **1.7.1 “To study the perceptions of diet, attitude towards food, eating habits, family meals and food preferences to gain an insight into the eating behavior and practices”**

The priority amongst the objectives would definitely be the perception that the youngsters develop towards food. Since most of these adolescent girls are born and brought up in middle class families where eating out quite often is the norm, regular home cooked food doesn't enthuse them one bit and since they get to live in a hostel far away from parents, it's an opportunity for them to act upon their whims and gorge upon the food they have always wished to and almost as often as they want. Living in a family comes with certain restrictions and the food they get to eat with parents is pretty morose, boring, monotonous and devoid of taste. As a result they have a natural craving for eating outside and getting to stay alone satiates this desire. Further, eating outside gives them a sense of independence where they have the liberty to decide what suits them best. Eating out with friends gives them an added sense of feeling elevated as it indirectly reflects the socio-economic status of the family. These all reasons taken together shape a certain habit amongst these adolescents and may promote them to follow a particular dietary habit which in the normal course may seem a little untoward. Even their punctuality in meals is a bit skewed as their classes are at odd hours and they can't spare much time planning to have a meal. Their meals are so highly erratic that they can't be expected to have their lunch around the same time every day. Even the venues keep changing and these changing patterns expose them to the risk of picking ailments. Thus studying the changing perceptions of these adolescents towards diet gains a vital importance and could be considered to be one of the major objectives of the research work. It's not just the perception regarding food that has changed, it's in fact the preferences also that have undergone a sea change. For instance, home cooked food is usually low on oil and extra calories, maybe that's the reason it lacks the kind of taste that these adolescents yearn for whereas the food they eat out of their homes has those extra spices and oil which gives it that added taste. All the more, as far as the variety is concerned, eating out

comes with a premium of getting to eat the widest of varieties even though they might score low on quality and hygiene. Thus it can be safely presumed that these adolescents have a changing attitude towards food and as they get to live far away from their families, they get an opportunity to eat something out of the regular. The instance of these young girls coming from vegetarian families is quite common. The study revealed that a lot of them picked non-vegetarian habits with their friends and gradually developed a taste for that. Thereby how they perceive food and what bent of mind changes their dietary habits is a natural objective of this study.

### **1.7.2‘To study relationship between dietary pattern and family background of girls residing in hostels for coaching’**

Further, these girls come from certain family backgrounds and have a particular dietary habit which they have picked subconsciously from their parents. This background and the role it plays in inducing an exclusive eating pattern amongst these adolescents seems to be one more relevant objective. This relationship between their family backgrounds and what they eat carries a lot of worth as it lays a long term foundation for a certain pattern of life that these adolescents pick. Like in certain families breakfast is given an importance that exceeds even the importance given to lunch and dinner whereas in certain families breakfast is almost nothing and it is an early lunch that compensates for the lack of breakfast, this may impact the health of the girls beneficially or adversely and can be construed as a logical objective of the study. In fact the family background of the girl has an important role in deciding the long term health of the girl. It’s normally seen that girls from families where oily food is the norm are usually obese as compared to the girls from families where special care is taken to avoid excess oil. Religion, caste, family units, region to which a family belongs play a significant role in deciding what a girl eats in her normal routine. Sometimes adolescents pick certain dietary habits from their families which are difficult to give up across their lives even though it might not be exactly conducive to good health. Certain specific tastes that the parents carry are often passed down to youngsters which

they might not have otherwise picked. These adolescents may hang on to these habits even when they live in hostels quite far away from their home towns. We have commonly heard of cases where adolescents living in hostels find it difficult to adapt to the changed circumstances and fall sick as a result of not getting the kind of food they are very much used to eating. They lose their normal course of life and give up their targets midway. Thus having a fair idea about how adolescents pick the habit of consuming certain edibles as a result of their family backgrounds may definitely merit being a decent objective.

### **1.7.3 “To assess the level of knowledge girls have on nutrition and nutritional needs for maintaining good health.”**

In the course of searching objectives, there are a few things which figure amongst the top in the list and one such objective seems to be the level of awareness these adolescents have regarding good health. Having a know-how of good health and what it takes to be healthy goes a long way in building adolescents into stable adults. Thus evaluating the knowledge these girls have about nutrition and the nutrients that are needed to keep the body healthy is of prime importance. Normally such youngsters can be assumed to be having a fairly undisciplined lifestyle as they are quite adventurous and experimentative at this age and may always be on the look-out for something new that could be tasted. Having knowledge about what is required to be healthy may prevent these girls from picking unlikely ailments, stomach disorders and keeping their dietary habits on track. Assessing the knowledge these girls have about nutrition may prove to be quite a revelation as it may help us to ascertain certain major reasons that might be proving a real drag on the girl's health. It is also commonly discovered that girls don't have much of a knowledge regarding what vital nutrients keep them fit and going all the while. Whatever ideas they possess about fitness are all skewed in favor of what they love and are the least interested in having meals that might be considered healthy. Assessing the knowledge of girls regarding nutrition has quite fittingly been chosen as an objective as it will definitely serve the purpose of intervening later, as coming to know what they don't know about their own health

and the misgivings they have about a healthy life can be informative in appraising what ails them the most. Further it might also be pertinent in making them understand how to conduct their eating habits so as to have a healthy body. Certain vital vitamins and nutritive foods may not be actively present in the food they prefer to eat as most of these adolescents are used to eating at roadside vendors and it deems fit to educate them what suits their health the most and what could be consumed on a regular basis to keep their bodies in shape. The level of awareness about nutrition in these adolescents is so poor that they find themselves confused and short of answers when it comes to deciding what would suit their bodies the best, in fact it's the peers who compel these adolescents in taking decisions regarding their nutrition. Even certain misinformed views about health and nutrition may cause a severe problem to the long term health of these girls, thereby, one major objective is to somehow statistically evaluate the knowledge these girls have about the nutritional values of various edibles that they routinely consume.

#### **1.7.4“To determine consumption of diet with different proportions of macronutrients and micronutrients that help in contributing energy.”**

Taking a step further, it seems necessary to evaluate the food they are consuming on certain parameters like the proportion of proteins, vitamins and fats it contains and to what extent these nutrients affect their performance in their chosen field of study. All these nutrients are vital to the performance of one or other specific function that a human body sustains on. Evaluating the comparative ratio of macronutrients as well as micronutrients in the food that is being consumed by these adolescents seems to be downright significant as it may prove to be an effective mirror in showcasing the quality of diet that a child is habitual to. Like proteins, carbohydrates and fats are known to be the macronutrients that a human normally consumes in a diet that can be called healthy. As people are universally acquainted with the essential as well as non-essential categories to which protein normally belongs, it remains to be judged whether majority of these adolescents are actually consuming meals that are high on essential or non-essential proteins

as non-essential proteins are known to cause severe chronic ailments that may deter the natural growth of a young body. The recommended dietary allowances as directed by the ICMR for young girls are as follows:

**Table : 1.2 Recommended dietary allowances as per ICMR**

<b>Age group</b>	<b>Energy(Kcal/day)</b>	<b>Proteins(gms/Day)</b>	<b>Fats(gms/day)</b>
16 to 18	2060	63	22
18 to 25	1875	50	20

As proteins are an active combination of hydrogen, oxygen and amines which might not always be as advantageous as they seem to be, their intake has to be carefully balanced as it may reduce the possibility of inadvertently consuming unnecessary proteins which the body may find difficult to digest. Usually the home cooked food contains important elements which are high on good and essential proteins which are normally missing in food they eat out of their homes. Most of the food they consume by the roadside lacks significant proteins of healthy nature. Further, even the carbohydrates can't always be deemed essential as they are broadly categorized into monosaccharide, disaccharide and polysaccharide which have their own significant roles in the overall conduct of human body. Like it's common knowledge that monosaccharides and disaccharides are active ingredients in fructose and glucose and are considered harmful to a certain extent whereas polysaccharides are an active ingredient in roughage and are considered to be beneficial. Thereby even a rough estimate of the proportion of these nutrients gives a healthy idea about the quality of diet being consumed and as a result a guess could be made about the levels of energy these adolescents derive from the diet they routinely have. A balance of these given nutrients further makes an impact on the longevity of a human body. Moreover, Fats also merit a consideration as far as a healthy diet is concerned. Even the fats can be majorly categorized into essential as well as non-essential fats. The kind of diet these adolescents consume comprises more of non-essential fatty acids which get stored over a protracted period of time and can turn out be detrimental as it is considered to be the real cause behind the accumulation of

cholesterol whereas the essential fatty acids are a storehouse of energy and the body gets to burn them as and when a sudden burst of energy is needed. Further, even the micronutrients like water, minerals and vitamins contribute a lot towards energizing the body. Water, as is a fact, keeps the body hydrated and also helps in draining toxins out of the body and a good proportion of water amongst other important nutrients vitalizes the adolescents to the greatest degree possible. Even minerals like calcium, manganese, iron, phosphorous, magnesium and folic acid have the potential to keep the body slogging and a diet rich in these minerals can actually contribute towards the overall well being of the adolescents. Research has long proved the inevitability of calcium in keeping the bones free from common ailments that afflict the bones. Even vitamins of all sorts have their respective roles in keeping the diet fit to consume. Like Vitamin C present in citrus fruits like orange gradually builds the immunity of these adolescents and ensures a prevention against any possible disease that a girl might pick through her surroundings. As the facts stand, these girls are the least used to taking fruits when they are away from their parents, which gradually deprives them of vitamin C thereby making them susceptible to various illnesses like common cold, throat aches and headaches as they progressively lose their immunity. Same is the case with the deficiencies of other vitamins like vitamin A which is found in milk products specifically. Since these girls are living alone, nobody actually inspires them to go for a glass of milk which their mothers usually do when they are at home and this with the passage of time causes a lack of vitamin A which may cause them to suffer from ailments of the eye like night blindness and conjunctivitis. All these deficiencies taken together may prove to be disastrous for the adolescent as a whole. Thus it actually props the need to choose this as an objective for the study as it would definitely help us to delve much deeper into the study even more methodically. Analyzing these deficiencies makes it much easier to carry forward the research comprehensively with proven facts which would go a long way in facilitating the course of study. Thus having a fair judgment about the balance of macro and micronutrients in an adolescent's diet can lead us to analyze conclusively that the given adolescent is lucky enough to get a healthy diet or is going through a rough phase and getting to eat substandard stuff. A

healthy balance between macro and micro nutrients is a natural consequence of staying with parents as they are protective enough to ensure that the girl gets to eat the best but while living in a hostel, a balance between nutrients is hard to find.

#### **1.7.5 “To identify the health problems in girls residing in hostels for coaching due to lack of nutritious food.”**

As a natural consequence of not getting good to eat, these young girls residing in hostels get to suffer unimaginable problems of uncontrollable magnitude which may even deter the normal course of their life and subject them to the kind of stress which they had never experienced before. Life for them gets complicated enough to be resolved and may even compel them to quit their studies mid-way or may even result in these youngsters taking life threatening steps. Life can't be imagined to be easy for these youngsters as they suffer lots of digestive and metabolic disorders which might aggravate with the passage of time and the problem might even deteriorate to such an extent that it becomes incurable. Digestive disorders are a common ailment amongst these adolescents and it's common to see them languishing with diarrhea, constipations, acidity, nausea which are all a result of the roadside food they are quite used to consuming on almost a routine basis. This may not trouble them that much intensely initially because of its spasmodic nature but as it gets pretty much regular, it may hamper their life to a large extent. A careful examination of these youngsters throws up a statistic that is hard to believe. Majority of them are found to be ailing with curious digestive snags which they might have developed over a period of time but choose to ignore it as it is not directly hindering their life but as it carries on, it gradually worsens to the point of no return. If the food is valued on the basis of nutrition, what these adolescents get to eat at their messes or the paying guest facilities is pretty much worthless as it contributes practically nothing to the overall well being of the students, on the contrary it might actually cause certain incurable ailments if it is consumed consistently over a prolonged period of time. Nutrition becomes an important issue as in this growing age these adolescents

require food that scores high on vitamins and proteins whereas much of what they eat is just high on empty calories and has no nutritive value whatsoever which results in a gradual worsening of their health and a progressive deprivation of immunity which further makes these girls susceptible to disorders that may turn ugly if not taken care of. A diet shorn of vital nutrients like calcium, iron, sodium and folic acid leads to a stage where these girls start experiencing pangs of disorders quite intermittently and are not even able to respond till the problem balloons to a stage that could be considered devastating in all respects. As the food they consume is responsible in energizing them and can be considered truly accountable for their performance in their day to day conduct, it gets mandatory to an extent to assess the proportion of all the important nutrients they intake on a regular basis so as to conclude convincingly whether an adolescent is suffering a nutrition related problem. Identifying a health problem, thus, can be taken as a logical objective of the study if we are to appraise the core reasons behind the majority of physical ailments that these girls have to go through while living alone. Further, the food they consume on a regular basis doesn't easily pass the test of quality neither in terms of hygiene nor in terms of spices. The spices commonly used are shoddy and cheaply available not at all fit to be consumed and a prolonged usage of such spices may lead to girls picking peptic ulcers, developing fissures and piles. The roadside food that is so common amongst these youngsters is high on hydrogenated oil that is over used to such an extent that it doesn't remain fit to be consumed by any normal human being and these all misappropriations taken together make a deadly mix lethal enough to throw these adolescents' life out of gear. It is commonly observed that girls with no family history of diabetes and hernia tend to pick these disorders as a result of unhygienic food that they commonly eat at paying guest facilities and at street side vendors. Even the pulses they consume are not cleaned properly as they should be and since pulses are a rich source of protein, these adolescents lose out on an important dose of protein on a regular basis. Further they often don't get to eat pulses as pulses are pretty much costly and the paying guest facilities and the messes try keeping the pulses out of their menu as much as possible thereby depriving the girls of a rich diet that they should get on a normal course. Lack of

quality vegetables on the menu also deprives the girls of important vitamins and minerals thereby causing severe ailments, the effects of which are quite covert initially but they surface as the deficiency grows. Often these vegetables are not properly washed and are served ignoring the hygiene thereby exposing the girls to acute intestinal problems and infections which may prolong and become chronic across a period of days and months. Consequently, these girls have to bear threats to their fragile bodies along with the mental pressure to perform at their studies which together might take a toll on their sensitive minds and throw them off their tracks. Health of these girls is an issue of concern as staying away from parents brings an added responsibility on their shoulders to fend for themselves and to look after themselves in times of crises. In a nutshell, the food that they consume is not just lacking nutrition but is also questionable on the issue of hygiene. Living in these conditions is a burden these adolescents have to go through and having to tackle it alone is a challenge. Thus majority of these girls have to survive under a constant threat of illnesses and finding the right food that scores equally well on both the counts, nutrition as well as hygiene proves to be a big deal. Moreover, identifying these health problems being faced by girls living in hostels seems to be an objective of fair significance as it boosts the overall study and lends it quite a degree of relevance. Specifically so, as the matter of nutritious food and hygiene carries a lot of weight and can become a matter of concern if not paid heed to. It could even be concluded to a certain extent that life for these girls in Kota is not all about coping with the turmoil of performing at academics, it is also about keeping oneself physically fit and in the right frame of mind to be able to sustain the pressures successfully. Taking the disorders further, it is quite practical to presume and is also visible that most of these adolescents suffer obesity as a result of consuming unsaturated fats found abundantly in roadside snacks, kachoris, pav bhajis and chola bhaturas. They get so much addicted to this food that they stop fancying the normal diet that they should get in a routine. Obesity, as a disorder could be deadly if it lingers on beyond a while as it may lead to cardio-vascular diseases and might also put an undue stress on the organs and body as a whole. A serious paucity of Vitamin A, D and E results in skin rashes and hair loss amongst the girls and over the years this has become one significant cause for the lack of

confidence amongst young girls. Certain complex nutrients like Vitamin B12, folic acid and iron are in a severe dearth in these adolescents and may just result in making the girls severely anemic. Many of these girls even suffer loss of blood as a result of uneven menstruations which again causes anemia of a severe kind. Being anemic at this young age comes with its own set of repercussions, like these adolescents living in hostels are more often than not seen to be complaining about dizziness, nausea and lack of concentration which are all a consequence of being anemic. A lack of Vitamin A amongst these girls also results in eye disorders and many of them are found to be suffering from weaknesses of vision. Most of these girls are diagnosed to be myopic and have to rely on specs right from a young age. Same is the case with other vitamins as well. Like these adolescents are found to be lacking in Vitamin D as well which puts an undue pressure on their bones and makes them susceptible to fractures and even prone to weaknesses in body frames. Further, they may even start experiencing an early arthritis which is normally experienced amongst people in old ages. It seems a bit odd to see youngsters in the age group 16 to 25 complaining of joint pains, breathlessness, fatigue and common digestive disorders when normally considering this is an age when these ailments practically count for nothing and adolescents seem almost oblivious to the presence of these disorders.

#### **1.7.6 “To identify the factors affecting weight management of girls residing in hostels for coaching.”**

Another significant objective in the whole process of research is the identification of factors that de-stabilize the weight management amongst the girls living in hostels. The management of weight is an issue of concern for these young adolescents as they tend to eat food that is high on unsaturated fats which over a period of time get accumulated in the arteries as cholesterol which may lead to several cardio-vascular disorders and also obesity which in itself makes the body very much prone to varied weight related imbalances. Most of the roadside stuff that they consume contains over used hydrogenated oil that becomes a real threat to these girls if they carry on consuming it on a regular basis. Majority of these

girls residing in hostels can't spare much of a time on exercises to keep themselves fit, nor are they able to keep a tab on the amount of oil they intake on a routine thereby adding on those extra kilos that may seem harmless initially but expose their bodies to the added risk of picking ailments that can turn incurable if not taken care of timely. Weight management therefore, in the present era is a serious and debatable matter and as far as these adolescents are concerned, it gains an additional importance as majority of them are found to be suffering from weight mismanagement. In this era where good looks carry a tremendous importance in the life of these adolescents and fashion rules the world, being overweight is a serious drag on one's personality. A serious sense of self esteem doesn't go well with an extra flab around one's waist and these adolescents seem to take weight issues pretty much seriously. Girls who are a bit obese are teased and gradually become a laughing stock. The issues of weight are not just limited to one's perceived image by friends rather obesity is a problem that extends beyond that. An adolescent who is a bit obese finds herself very much prone to lethargy, susceptible to feeling sleepy the whole day and a butt of jokes amongst the friends, which severely hurts her sentiments and the idea of self esteem that she has built around herself. Amongst the girls, the problem is even more pronounced as there is a constant competition amongst them to look good and anyone who is a bit on the heavier side gets to bear the weirdest of sarcasm. It's not just the comments that veer around obesity that make their life troublesome but also the fact that such obese girls are never considered in the normal scheme of things and are normally ignored by peers and if not ignored, they are pitied by equals.

Putting on weight is a modern day disorder afflicting majority of the youngsters living in cities as the out of order routine that they follow while taking their meals and most of the food that they get to eat at their hostels and paying guest facilities makes them quite vulnerable to many other associated physical disorders. Thereby identifying the factors that impact the weight management amongst the girls can prove to be very much helpful in taking steps towards resolving the problem to the largest extent possible. Further obesity has innumerable drawbacks like uneven blood pressures, too much of weight on the frame results in fatigue, and gradually

obese people develop a problem in their knees as the legs have to constantly bear a weight beyond their capacity. They lend themselves pretty much prone to accidents of all sorts as they lose their reflexes that people should normally possess at a certain age. The problem gets even more compounded as they pick ailments as a result of obesity like indigestion, excess accumulation of sugar leading to diabetes, and all these disorders taken together make a deadly mix to be eternally feared. With the passage of time, it gets excessively difficult to treat obesity, though it is not completely irreversible, it requires a lot of will power and burning that much of fat doesn't seem practical as it further leads to several more unavoidable consequences. Thereby weight management for these adolescents is not as easy as it appears to be superficially. Most of these girls living in the hostels have a skewed BMI (body mass index) which develops as a result of erratic eating habits, consuming food high on fats and absolutely no exercises at all. These girls have an uneven MUAC (mid upper arm circumference) which indicates the accumulation of fat in body parts where it should not. There are cases which are quite the contrary. Since these girls are living far away from there, some of them may tend to develop a habit of missing out on their meals and as the time passes they get used to it, they learn to bear the pangs of hunger and start skipping meals almost back to back. Or they might just substitute a belly full meal with some tit bits which can quench their hunger for a while but can't be considered a meal in itself. If this carries on for a couple of months, these girls start suffering from malnutrition as they get devoid of certain very important nutrients which can only be found in regular meals. This in turn impacts their weight and many of them are reported to be underweight which results in severe deficiencies of certain very significant vitamins crucial to a balanced growth of the body. Like if they missing out on pulses and vegetables, important vitamins and proteins elude them making their bodies vulnerable to many ailments. Some of these adolescents skip their meals on a regular basis as being thin looks cool and they get a certain edge amongst the peers but in the process start suffering from anorexia which takes a heavy toll on their physical as well as mental growth. Since elders are not there close to them to guide them on the right path, these girls take decisions on their own and as a consequence develop disorders of a severe

kind which may become irreversible if not taken care of timely. All in all it's not easy for most of these girls to manage a balanced weight staying away from parents and majority of them are either found putting on weight and there are some of them who start losing their weight to such an extent that it threatens to get lethal if it carries on. In a nutshell, weight management assumes tremendous significance with these girls living a life of independence without much interference whatsoever from parents and elders. It may seem quite innocent initially but these girls carry on this imbalance for years to come and it gets chronic to such an extent that even medical intervention of the highest order can't resolve it. If erratic eating habit carries on for a while, it may take an ugly monstrous proportion and lead to a stage where a girl starts ignoring even the basic urges of hunger and gradually develops intestinal complications which may turn into ulcers of the worst kind. Majority of adolescent girls may fail the requirements of height and body mass index and are reported to be either on this side of the fence or the other side of the fence. So, as the facts and evidences indicate, the factors affecting the weight management and causing imbalances in the body masses of these youngsters are difficult to be controlled and can be taken as one of the major objectives of the study.

#### **1.7.7 “To plan an intervention to improve the nutritional status by educating the girls residing in hostels for coaching.”**

Why is there a need to intervene? Since it is a study to intervene for educating the girls on the perfect nutrition that could keep them in the best of shapes, it deems fit to chart out a perfect course to intervene so as to be the most efficient and effective in the given objective. These adolescent girls are in Kota for the sole purpose of building a career and if somehow lack of proper nutrition hinders their path in achieving their goals, there is a need for the counselors to intervene so as to train them how, where and when to eat the best.

- a. They need to be educated as to why and how quality edibles can keep them fit and raring to go and what is the need to be cautious about what they are being offered and whether or not to go for that. A healthy intervention entails figuring out what most of these adolescents are consuming, where do they get to eat most of what they consume, who inspires them to go for such a diet. Is it just their personal choice to consume such meals, do they really find it delicious or is it because of the fact that their immediate circle of peers is very much used to consuming such food on a regular basis.
- b. There might be a few other factors encouraging them to go for such food like the neighbourhood, availability of a certain meal in close proximity, time of the day when they feel a serious urge to eat something and what do they get to eat when regular meals are not available. This all data can be methodically generated when these adolescents are personally talked to, their preferences are noted down, and then the available data is subjected to thoughtful scrutiny.
- c. There are umpteen reasons why an intervention, if meticulously planned and executed can't produce excellent results. A major reason is most of these young girls are immature with no personal choices and priorities and when they get to stay out of their homes, they have little or no choice than to follow the popular meals that most of their friends love to eat thereby making it necessary to intervene so as to educate them of the evil consequences of the meals that they start consuming because of their friends.
- d. Most of the meals that they intake are dubious in nature as there is no guarantee of the presence of vital nutrients in them as is proclaimed by the sellers.

- e. Intervening seems to be the only way to make them aware of the ill effects of these meals and to somehow turn their loyalties towards better foods available. Planning an intervention is not easy as it would have to rely on certain pre-requisites like a counselor needs to be well aware about the meal preferences of the girl being counseled, the family background of the adolescent and the specific role food plays in the choice of life the adolescent aspires to.
  
- f. Counseling with the right background information could work wonders for the given adolescents as it may lead to a dramatic change in their eating habits thereby seriously turning around their bodily well being. If somehow this intervention is well timed and well intentioned, it may help to put a check upon the common ailments these youngsters suffer consequently improving their overall performance at academics as well.
  
- g. Planning an interventional program may prove to be quite a helpful initiative as it would enable us to know how and what exactly these adolescents consume in their routine meals and what exactly ails them as a result of these meals. Further, planning an intervention may also help us in making the adolescents understand the concept of a right meal, and the edibles that could be considered vital as they consist of the right mix of nutrients which impact the body metabolism to a large extent.
  
- h. Their nutritional status could actually be improved if they are taught seriously about the repercussions of the kind of food they consume, the crucial nutrients that these meals are missing and what could actually be consumed on a routine so as to keep one's diet balanced in all respects. It's commonly seen that when these adolescents are made aware of the evil consequences of the meals they are taking and the erratic behaviour of their consumption, it may enlighten them to a very large extent and make

them bring about a change in their eating habits. Thereby an intervention has manifold benefits if it is planned meticulously and executed with precision.

- i. A healthy intervention that is put into action should consist of certain factors that make it balanced and motivating for the adolescents and encourages them to adopt a diet that has the right mix of nutrients which make the meal nutritive and healthy.
- j. Further, it again seems fit to figure out whether the respondents are actually staying in hostels and are having to consume food at messes and roadside vendors or do they sometimes get to have meals at relatives place which can be called healthy and hygienic to a large extent. In such a case the girl can't be categorized with other girls who are having to bear substandard food almost all the time and are exposed to risks of picking ailments of the worst sort.
- k. Taking the argument to the next level, it also has to be ascertained whether these adolescents are in the habit of experimenting varied foods on a regular basis or they are content with what they are getting to eat at their regular facility. This, in a way proves that the girls trying or willing to try different foods are a bit more vulnerable to digestive ailments and disorders as compared to the ones satisfied with their routine meals.
- l. Moreover, most of the girls who are living in paying guest facilities where they might sometimes get an atmosphere that resembles a family and are offered quality food to eat, may not be considered in the same league as the others, but as far as the majority cases are concerned, they all have a propensity towards eating food that is unhygienic and require a counseling of serious and devoted nature.

- m. Summing up all the objectives, it seems pretty obvious that the study has to aim certain goals which will help us in deducing an appropriate methodology for collecting data and then analyzing that data with the right set of tools keeping in view certain exceptions that have to be kept apart. The given objectives will keep us on track and help us in pursuing our study with the right frame of mind.
- n. Thereby, if the conclusions have to be spot on, the objectives have to be well targeted and tacitly planned. As the whole study is centered around adolescent girls residing in the hostels of Kota, their dietary practices, their nutritional status, what they lack in a diet that could be called balanced, the city as a whole and what it offers in terms of a diet has to be taken specifically into consideration.
- o. A special care was taken to identify the kind of backgrounds the girls belonged to and the relationship their regular diet had with their specific backgrounds. It was also painstakingly ascertained whether the level of knowledge the girls had, was sufficient regarding nutrition and what are the pre-requisites of a good nutrition so as to maintain good health. Though, it seemed a little burdensome and tedious, but still the task of determining the balance of macronutrients and micronutrients was executed with a precision as it gave an idea what nutrients these youngsters severely lack. Macronutrients like proteins, vitamins and fats have a certain proportion in diet perceived to be healthy and an imbalance in this proportion can lead to disorders of a devastating nature. In a similar way micronutrients like water and minerals have to be well balanced and a scarcity of certain vital minerals can be catastrophic.
- p. A balance between macro and micro nutrients carries significance as an imbalance in their required proportions can make a human body prone to afflictions of a severe nature. Even their contribution to the overall energy is imperative to the way a human performs his daily conduct. Further, identifying the kind of ailments girls suffer due to lack of these vital

nutrients will prove to be effective in tackling their problems even more efficiently.

- q. Not getting to eat nutritious food gradually makes them vulnerable to bodily harms of varied kinds and locating these disorders would be of sheer help in fixing these problems. It's the lack of availability of nutritious food in near vicinity that is the major problem, further lack of informative sources and unavailability of guidance also make it difficult for these adolescents to manage a balanced health while being away from the parents. All these deficiencies taken together put an unavoidable burden on the fragile health of these youngsters and open them to the risk of picking incurable ailments.
- r. Thereby closely identifying the diseases that trouble these youngsters and matching them with the lack of nutritious food because of which they crop up can go a long way in advising these youngsters the best possible nutrition to have a healthy and fruitful life. Moreover, this erratic habit of meal consumption in these adolescents is directly related to their weight management and majority cases of obesity amongst these girls are all because of untimely consumption of meals, avoiding regular healthy foods and fruits, excess consumption of oily stuff and almost no physical exercises.
- s. All in all, managing the weight for these young girls is not an easy task. Even the contrary is true, some of these adolescents are used to skipping their meals and this over a period of time causes anorexia and the weight loss is such massive that either it makes them almost incapable of pursuing their regular lifestyle or prone to regular weakness related disorders. These all objectives taken together will help us tremendously in planning a useful intervention keeping in view the deteriorating health of these youngsters and motivate us to guide them in the right direction so as to qualitatively

enhance their nutritional status and their overall perception towards a balanced health.

## **1.8 HYPOTHESIS**

The study has to necessarily rely on certain assumptions which are decided keeping some facts in the backdrop. After all a research has to progress on a hypothesis which can either be concluded to be fair guess or just a wild random shot. A hypothesis occupies an important place in a study as a research can't move on without certain presumed goals. Even though the assumption might turn out to be fanciful at best, still it guides the researchers to follow a track in an attempt to explore some concealed elements within the study which can only be unraveled through persistence. Further, the significance of hypothesis lies in the fact that targets and goals have to be decided even before we set on a task as they help us in tracking our progress and constantly motivate us to carry on. Further, an assumption while pursuing a study can't be wild enough to be absolutely off the mark. It has certain vital elements that lend it some weight and allow it to sustain the test of time. Even though, an assumption might turn out to be downright baseless, it still guides us fairly well in the process of achieving our conclusions. To carry forth a study with an assumption helps the researcher to justify the outcomes with the goals in mind otherwise it might turn out to be real burdensome as conducting a study with no destination to reach could prove to be directionless and off the mark. A right set of hypothesis helps us balance our study with an anticipated outcome, though such a speculation might result in certain let downs but that doesn't mean we should start without a motto. The hypothesis that we have zeroed on has been chosen with utmost caution and with a fair degree of knowledge gathered through relevant sources:

1. “There will be significant differences in food preferences and food satisfaction among the girls residing in hostels for coaching in relation to eating behavior and practices.”
2. “Family background will make a difference in dietary patterns of girls residing in hostels for coaching.”
3. “Level of knowledge on nutrition and nutritional needs will be significant in maintaining good health.”
4. “Consumption of diet with different proportions of macronutrients and micronutrients will help in contributing energy.”
5. “Girls residing in hostels for coaching will experience health problems due to lack of nutritious food.”
6. “There will be several factors affecting weight management in girls residing in hostels for coaching.”
7. “There will be an improvement in the nutritional status of girls through a good diet counseling.”

## **1.9 RATIONALE FOR CHOOSING THE AFORESAID HYPOTHESIS**

The given study is a massive exercise into exploring the current nutritional status of the girls living in the hostels of Kota and then contemplating upon a plan to counsel them so as to bring about a perceptible change in their attitudes regarding meals and how they relate what they eat with the kind of life they are wishing to pursue. Since the city could boast hosting adolescents from almost 27 different states of India, expecting that they all have similar consumption habits would be just utterly naive, their eating habits are as different as chalk and cheese, so much so that most of them find living in this city for a prolonged period of time almost impossible and just give up, leaving the city in the middle of the session never to return back. This enjoins upon us the need to presume certain factors that seem to be true on the face of it but may later prove to be a bit in approximation. India is a land where cuisines and eating habits differ with every passing kilometre, the random sample taken out of the hostel population of girls may not be an ideal indicator but could be considered a justified hypothesis to carry forth the study undertaken. The only positive being the age group to which majority of them belong. Since the subjects chosen lie in the age group 16 to 25, it could be safely assumed that their likes in terms of edibles might almost be the same with of course, a few exceptions. Though they belong to regions that are vastly different, still choices regarding food available outside are roughly the same as a result of globalization and the uniformity in the westernization of food. This has helped us in making a healthy guess what these young girls prefer eating outside. There are certain regions in the north east where even the regular meals differ drastically than what the people eat in central India and taking all these finer nuances into consideration, the hypothesis has been listed with a certain degree of earnestness.

**1.9.1** It can be safely presumed that majority of the girls living in hostels belong to different regions and as such their preferences regarding food can't be the same anyhow. Whether it be a breakfast, or a lunch or even a dinner, their likes are so different that making them sit at the same table for a meal can be an exercise in futility. Like students belonging to north and central India like Delhi, Uttar Pradesh, Punjab, Haryana and Madhya Pradesh might have more or less similar

eating habits but girls from Tamil Nadu, Kerala, Karnataka and Goa may show very different traits while preferring a certain meal and if states like Mizoram, Tripura, Meghalaya and Manipur are concerned, girls belonging to these states have meal preferences which might actually be downright revolting for students belonging to central states. Further girls from the south have rice based eating preferences which is not always the choice for girls belonging to north and central India. Also personal preferences have a role to play in shaping an adolescent's eating habits. Sometimes families develop a particular penchant in the child for eating a certain kind of food which may grow with the passage of time and evolve as a serious liking, for such a girl adapting to an environment where such a food is not available can be a serious challenge in adjustment. Along with preference, satisfaction also carries a serious weight. Sometimes, girls may love something for a change but developing that meal in regularity is an ordeal and might even be harmful for the health of digestion. Like oily roadside stuff can be delicious for a while but can turn out to be really unhealthy and unhygienic and may lead to severe digestive disorders. Feeling satisfied with a kind of food may also vary from girl to girl as every adolescent has a different choice in terms of meals at different hours of the day and if such a wholesome meal is not provided at that hour, the adolescent might have to stay hungry and may feel dissatisfied with whatever little she gets to eat. These youngsters are experimenting and adventurous and love to keep changing loyalties for foods that they are practically alien to. Though, this might be a little harmful for them, they can't be forced to eat what they have been eating traditionally for years, thus the idea of feeling satisfied is a complicated one and all these girls can't be measured on the same parameters. Same is the case with preferences as these girls can easily change their likings and may start preferring something that they didn't have a taste for earlier.

Even the level of satisfaction can't be the same amongst girls in the same age group as it may also vary as per individual choices, specific likes regarding food, body weight and individual levels of metabolism. In fact, individual tastes might also change with the passage of time, like what they are loving today may not seem as enticing the next month. Feeling contented with a meal is again a matter of gaps these adolescents normally give between meals and do they actually get

the kind of breakfast they desire and if not so, is their meal heavy enough to compensate for the lack of proper breakfast. These all factors taken together give each individual girl a preference and satisfaction that is at a variation from others.

**1.9.2** Another strong assumption during the course of the study is that family backgrounds matter a lot when it comes to having a certain dietary pattern as these girls pick the habit of consuming a particular meal with ease as a result of their parents insisting upon and consuming the same thing for a prolonged period. For example, if parents have been strict vegetarians, the girls find it very difficult to pick non vegetarian food at any point of time in their life and even adjusting with a room-mate who is a non vegetarian becomes a challenge. The same stands true for spices as there are families where spices are used liberally and these young adolescents develop a habit of eating spicy food whereas the same may not be true of girls belonging to families where spices are restricted to a mere formality and food is simple and morose devoid of the delicious tinge of spice. Such girls find it pretty tough to start eating spicy food as they haven't eaten such spices right from their birth.

Like certain adolescents imbibe the value of an early lunch and an early dinner with their parents and this value sticks for years to come and any forced change gets difficult to bear. There are cases where girls don't get to have an early breakfast as the hostel where they are living provides only lunch. This may result in the girl staying hungry for hours and learning to tolerate the hunger which leads to several metabolic complications later. Same is the case with dinner, if a girl is used to taking an early dinner and if the hostel provides her a late dinner, she chooses to sleep early with an empty belly rather than wait or she may even pick the habit of skipping the dinner altogether thereby aggravating the situation even more. Further, there are cases where families are more into eating outside quite often and girls from such families find it pretty much easy to adapt themselves to the hostel food but the same doesn't stand true for those adolescents who belong to families where eating out is almost a taboo. Even their metabolisms are found to be at variation from that of their friends. It's very difficult for such girls to digest what they get to eat at the hostel and often suffer worst possible digestive

disorders, nausea, dizziness, alternate cases of diarrhoea and constipation. Even vegetables, fruits and preparations that they normally consume at their homes are not that easily available at hostels, the lack of which may cause girls to suffer deficiencies and symptoms of an impending disease. There are families where even pungent things like onions and garlic are avoided and girls are brought up on a diet that is devoid of these two things but later when they are offered vegetables consisting of onions, they take a long time to adjust with this meal or in certain cases they are never able to adjust with foods that may even remotely consist of onions. The same is true on the contrary, girls who are used to consuming vegetables with a liberal addition of garlic and onions may find it very difficult to consume food which doesn't consist of these two consumables. Being in a hostel away from parents gives an opportunity to these adolescents to learn a lot about foods that they are practically alien to, as they get to interact with girls from regions far away from their own. Trying anonymous stuff seems adventurous and interesting but may cause troubles nonetheless. There are issues which are religious and community based in nature and certain girls have subconsciously adopted these habits from their parents, like for a girl born and brought up in a vegetarian family, even sitting close to a person eating non-vegetarian is revolting. For such adolescents adjusting easily in a hostel where even non-vegetarian is being offered with vegetarian comes tough. Thereby it gets pretty natural to start with a hypothesis that family backgrounds impact a girl's dietary pattern to a large extent. The fact gets validated with an example that applies to almost all of us that we carry a massive impression of what we have been eating across our life. This is even exemplified in the truth that our personalities, our respective metabolisms, our health in general is all a reflection of what we have been eating for years. These adolescent girls are in such an age group where they have already spent a considerable span of their lives with their parents and picked such eating habits which can't be changed and modified with the swing of a magic wand. It won't be much boastful to say that a lot could be said about a girl's overall personality by simply having a glimpse of what she has in her routine meals. The same stands true for quantities. For a girl who has been brought up with a strict instruction to eat substantially during her lunch and dinner can't be

expected to reduce the quantity of what she eats while she is residing at the hostel. Whereas there are girls who are never harassed at home regarding how much they eat which gives them a certain habit of relying on their gut feeling as to how much they actually require. Food in India has a lot to do with community sentiments and children are supposed to follow community meals which have been a tradition for years, for instance, if a girl from Bengal doesn't get fish in her regular meals at least once a day, it gets pretty difficult for her to get the right nutrition which she had been getting for years. It's common to see Bengali girls searching for an outlet in Kota that could provide them fish, though they may find fooding outlets offering fish but it might not be as nutritious and hygienic as it is provided at their homes. Same stands true for girls belonging to the southern states, who have been brought up on a steady diet of rice, idlis, dosa, uttapam and sambhar which are not as deliciously available as their parents provided them while they were at home. Parents have a certain way of feeding the children and the food normally provided by parents is nutritious and healthy to a large extent. A child who has grown up on a regular diet of a particular meal has his metabolism well adjusted to that, for instance, rice suits well to the girls from South but if a regular diet of rice is offered to people of North India, it is known to create major problems. So parental background is a factor that shapes up what a girl would like to eat in the coming days, how would she react when a certain food is offered to her and even how her metabolism responds when she gets to eat food that is not a norm in her own family. It's amazing to see how a human body adapts to certain food over a period of time. It's not just the food but the values they inculcate regarding food and the perception they develop about a particular meal, which matters even more. So, while living at the hostel, girls have to face a severe dilemma regarding what to eat and what not. For some it's much easier to break out of the parental mould and start eating whatever is offered as they love to experiment with new foods that they come across whereas for others it may be a nightmare to give up what they have learnt to eat over the years with their parents.

**1.9.3** Another significant hypothesis is safely assuming that most of the physical problems that afflict the girls could be averted by counseling them thoroughly on the need to consume healthy nutrition, guiding them about how and what could be consumed in a routine so as to sustain a balanced health and what all edibles could be either avoided or taken in moderation. It could be safely assumed that an awareness about nutrition and an interaction on their current nutritional status will go a long way in helping the girls maintain a sound health across their prolonged stay in Kota. Staying away from parents is fraught with the danger of consuming unhygienic food outside which might cause infections or other digestive ailments which may stay for long and get chronic with the passage of time. Girls are often found to be a little unaware about what is actually causing them to suffer a digestive disorder, the simple reason being, the disorder is not so pronounced initially but if it is allowed to linger on, it might spell disaster. Making them aware of the need to be healthy so as to have a fruitful life and career is an exercise which carries a lot of significance as, if the girls develop a knowhow regarding the need to update and enhance their nutritional status, it might become much easier for them to rectify the common health problems that they encounter on a day to day basis. There are some girls who are a lot aware about what to be consumed for a healthy life but majority of them remain blissfully unaware of the need to be healthy. This puts them under a grave threat of contracting a disease which may turn incurable if allowed to stay on. Thus educating the girls on the need to have nutritious food immunizes them from taking a step that may prove disastrous in the days to come. A balance of nutrients is hard to maintain while these adolescents are on their own as even if they desire to have healthy edibles like fruit juices, well proportioned proteins and vitamins, they don't actually get to access them because of lack of resources and absence of proximity. Though it's hard to say that such a knowledge of nutrition may work wonders but still a perceptible change could be well expected. Best example could be taken of girls living in hostels where majority of them are found to be anaemic because of lack of adequate iron in their diet. Thereby it can be plainly construed that the edibles that contain iron are not in their easy reach and the reverse is also true that they don't make much efforts to access them leading to problems that manifest

themselves in ways more than one. Though it might turn out be a challenge educating the girls about the need to consume nutritious food, still an effort may never go in waste as it may at least let them know what elements of nutrition they are missing and what all could be done to compensate for the lack of certain vital nutrients. It won't just be an exercise to enhance their knowledge about food as a whole, rather it would serve them for years to come. These adolescents are quick at learning and if they are made aware at what to be consumed for accomplishing and sustaining good health, it would definitely bring about a change for the better.

**1.9.4** We have assumed with quite an ease that a beautiful balance of macro and micronutrients has to be maintained and if it goes a bit off the track, it could throw an adolescent's life into a disarray. For a healthy life which helps the girl to grow equally well in all the directions, the proportion of macro and micro nutrients should be calibrated and balanced to a large extent which may sound to be difficult but is not impossible to achieve. If we talk in terms of macro nutrients like proteins, carbohydrates and fats, they have an equally important role in the overall growth of the body, like proteins, both essential as well as non-essential contribute their bit in toning up the body. The essential proteins are the ones which are readily absorbed by the body as they get synthesised pretty easily as compared to the non essential ones. Even fats to a large extent contribute to the extra body cholesterol, which may lead to complications later and of course carbohydrates which have to be there in these adolescents in the right proportion so as to give them a sustained health for years to come. It would be safe to assume that these girls avoid important edibles like milk which is known to be a complete protein as there is nobody to motivate them to have milk on a regular basis which normally their parents force them to have when they are at their respective homes. Same is the case with another important macronutrient like carbohydrates and amines which they severely lack because of irregularity of meals. The similar logic applies equally well with micronutrients like water, minerals and vitamins. It's common knowledge that majority of these adolescents are not used to consuming vegetables as they don't have an easy access, which causes lack of important vitamins. The hypothesis sustains logic to a large extent as most of the

food they consume lacks crucial nutrients as it is cooked unhygienically with substandard ration and thereby is seriously devoid of these nutrients. Even vital minerals like iron, folic acid, manganese and calcium are missing in their routine meals and could be traced back to the lack of quality that is offered at the mess and the paying guest facilities where these adolescents normally reside.

**1.9.5** As the entire research is rooted in assumptions, it suits that the assumptions are realistic to a large extent so that they help us follow the track. There could always be a scope of going slightly off the mark, but then the hypothesis should look pretty much convincing by popular perception. In the process of the study, it could be comfortably presumed that most of these girls suffer serious ailments as a result of what they get to eat far away from their parents as most of what they eat is unhygienic as it is cooked in large volumes in filthy conditions and even the adulteration can't be ruled out as majority of the ration has either gone stale or has just outlived its 'use by' date. Being away from parents puts them at the risk of consuming meals which are not just unhygienic but unhealthy as well. They often pick infections resulting out of filth found in roadside food. It's not just hygiene, but the preparation of that meal that matters a lot. The oil that is normally used for such food is of course substandard as these paying guest facilities quite naturally don't use the quality cooking oils so as to cut down the overall costs. Further, there are cases where this oil is reused to such an extent that it gets hydrogenated and thereby extremely lethal. These adolescents routinely consume such oil for a prolonged period putting their health under a severe threat. Most of them go for such breakfast which can be considered practically dead, like *pohas*, a common breakfast in Central and North India which is actually rice out of which starch is methodically sucked out, that makes it useless as a meal. Breakfast should usually be an energy booster and these young girls just don't get to eat anything in the morning that might keep them up and about till noon when they finally get to consume their lunch. Moreover, a majority of these girls are anaemic as a result of lack of proper iron in their diet. Scarcity of vitamin D makes them a lot vulnerable to fractures. Over the years, some girls have been known to pick ailments whereas they don't have any family history of any such disorder. Again a majority of these

adolescents are often diagnosed with worsening eyesight as they don't get to consume enough sources of vitamin B. Same holds true when it comes to consumption of fruits as these girls have to rely only on the regular course of meals with little or no fruits at all figuring in their diets and as a consequence they lack vitamin C, which gradually weakens their immunity and makes them a lot susceptible to various disorders afflicting them badly. These adolescents even languish under problems which are a direct consequence of what they eat like they are found to be under the influence of afflictions like skin rashes, irregular menstruations and erratic bowels. It could therefore be confidently assumed that these young girls have to suffer problems arising out of their meals where either adulteration, stale food, substandard ration, food high on empty calories but lacking in vital minerals and nutrients are the predominant reasons.

**1.9.6** Another vital hypothesis that has helped us carry forth our study is the assumption that these young girls find it pretty difficult to manage their weight while staying away from parents as the food they get to consume is so high on fats that over a period of months and years they accumulate unwanted fats through food with massive levels of cholesterol and as a result develop a susceptibility towards cardio problems in the years to come. Majority of girls living in hostels of Kota are seen to be obese as a natural consequence of consuming fast foods which are practically junk without any vitamin values. Thereby taking the argument of the study further with an assumption that most of these girls are obese and have to suffer a lot with weight related problems is a hypothesis that carries some weight. The hypothesis has an added importance as a result of the fact that majority of the doctors in the region have to put up with regular visits by these youngsters who routinely visit these doctors with weight related problems and also the attitudinal ones arising out of peer pressure. Nowadays looking good is imperative to the image that a young girl carries amongst her friends and obesity is a major hindrance to looking good. Moreover managing the weight with these girls is not an easy task as they aren't in the habit of walking and physically exerting themselves because of a burden of studies, so once they put on weight, it gets pretty difficult to cut it down and it lingers on as it is. As a result putting on

weight triggers a chain of problems and over a period of time imposes a heavy emotional baggage which could even hamper the normal course of an adolescent's life.

**1.9.7** Finally making an assumption that all these problems that the girls are going through can be successfully rectified and put to an end is of course a fitting hypothesis as counseling has been and will always remain one of the best ways to counter the crises. Since majority of these girls are going through one physical problem or the other which they often don't discuss with anybody, they have to suffer silently over a prolonged period which may even aggravate the problem making it chronic and incurable to a large extent. A fair bit of counseling might actually make the girls a little aware against consuming any kind of roadside material. This counseling, if done in earnest, can inspire the girls to go for meals that can be perceived to be healthy. It can be positively predicted that most of these girls have a comfortable degree of maturity and would definitely take the counseling seriously. Though they are already worried and nagged by anxiety regarding what they are eating and what effect this food is having on their fragile health, it can be anybody's guess that when they are counseled with hard facts, it would have a far reaching impact on their personalities. Thus, a healthy counseling to these youngsters could pave the way in the right direction for the research and would contribute to a certain extent towards the overall well being of these adolescents.

## **LIMITATIONS OF THE STUDY**

The research has certain limitations as no study could be considered complete unless all the factors are taken into consideration. Every research has to proceed with certain assumptions, some of which can prove to be real obstacles during the process of the research. These are those constraints that had to be ignored so as to carry on with the research with an uninterrupted flow.

1. The number of girls chosen as a sample can't be considered to be the true representative of the thousands of girls visiting Kota every year. Around 35000 girls from the length and breadth of the country visit Kota every year and the sample of 1050, which was chosen randomly can't practically represent the huge number arriving in Kota.
2. Girls from regions as varied as chalk and cheese are visiting Kota. Some regions like Tripura, Meghalaya, Mizoram and Assam from the North East and states like Madhya Pradesh and Uttar Pradesh from Central India, West Bengal from the East and Gujarat from the West of India. While choosing the sample, this diversity wasn't kept in mind which meant the sample of 1050 doesn't represent all the regions equally and certain regions haven't been represented at all.
3. Food across the country is different drastically, like girls from North East require a non-vegetarian diet every day. Girls from West Bengal demand fish on a regular basis and girls from South go for rice and rice based foods almost every day. The sample that was randomly picked didn't represent certain regions at all.
4. Thus the best sample would have been girls chosen selectively from all the regions, each region contributing a bit to the sample.

# **DEFINITIONS OF VARIABLES**

## 1.10 DEFINITIONS OF VARIABLES

1. **Over-protective<sup>17</sup>**: The term refers to the attitude the parents have towards children and the care they shower upon the children. Especially the children staying with parents have to face this extra dosage of care which may sometimes become a little irritating for the children, like giving an extra attention to what they eat, where they go, whom they meet. Though it's quite helpful and enriching for the children, it may lead the children to get cocooned and over dependent on the parents.
2. **Parental guidance<sup>6</sup>**: The term refers to the directions parents need to give so as to keep the children on the right track. When it comes to choosing the right meal, parents have to play a part in deciding what would suit their children the best. It's also a case of ruling out what would harm the children and warning the children against that.
3. **Dietary<sup>18</sup>**: The word has been derived out of the word diet and refers to the habits children develop as a result of a particular environment they are exposed to. Having a certain dietary habit means preferring a certain kind of food and consuming that with a certain schedule.
4. **Fooding<sup>19</sup>**: It's a word that was not actually in existence but is modified in nature and is borne out of the word food. This word again refers to the habit of eating a particular kind of food or the fooding industry which has developed over a period of time because of the growing needs of people to eat different cuisines.
5. **Satiate<sup>20</sup>**: This word refers to the satisfaction that the children get upon eating the kind of food they are offered or they are interested in. Different individuals feel satiated with different kinds of food and the word in context denotes the type of food adolescents love to eat as it satisfies them the best.
6. **Upheaval<sup>21</sup>**: The word refers to the change that has come about in the conditions and circumstances of Kota as a result of development of coaching industry that has gradually taken shape over the years. The change that has occurred due to the changing needs of people and the

propensity of people to have a different life that suits the new circumstances.

7. **Prosperous dividends<sup>9</sup>**: The term refers to the kind of money people have earned in Kota over the years as a result of getting into businesses that suit the needs of lakhs of students coming to Kota for gaining useful coaching for various competitive exams. Various businesses have done very well and have grown over a period of time.
8. **Influx<sup>4</sup>**: The word literally means entry of a person in a domain or an area. In the context of thesis, the word refers to the arrival of a large number of students at Kota for the purpose of taking admissions at various coaching institutes. The entry of such a large number of students has changed the scene to such an extent that Kota is now defined in terms different from what it used to be defined in earlier.
9. **Eateries and food joints<sup>5</sup>**: The term food joints is a relatively modern term and refers to restaurants and outlets that have come up in Kota offering students all kinds of fast food, south Indian cuisine and other traditional foods that the students might be interested in. It refers to major restaurants as well as small outlets offering meals of all sorts.
10. **Mushroomed<sup>10</sup>**: The word refers to the sudden growing and proliferation of restaurants and fooding joints all around Kota. Kota has seen a sudden spurt in eateries offering all kinds of delicious cuisines for the students coming from different parts of the country. Since they have grown uncontrollably, the word mushroomed aptly sums up the sudden growth of such joints.
11. **Sumptuous<sup>10</sup>**: The word refers to the delicious meals students love to eat at their hostels and paying guest facilities. The delicacies that children love to eat are sumptuous so that children could enjoy eating them. The literal meaning of the word sumptuous is delicious and it stands for all the delicacies offered to the students in Kota.
12. **Delicacies<sup>5</sup>**: The word refers to the delicious food that the students love to eat at restaurants and fooding outlets. The food that is delicious in taste suits the taste-seeking palate of children and has been called a delicacy.

Naturally the students love to eat food that is delicious or suits the special tastes of the students.

13. **Nutritive value<sup>5</sup>**: Each meal or type of food contains certain number of nutrients which are vital to the overall growth of children's body. The term refers to the important nutrients contained in a food or meal that make the food nutritive and thus worth eating. Each vital nutrient makes the food healthy to the body and thus while eating, food is normally known by the quantity of each nutrient it possesses.
14. **Imperative<sup>22</sup>**: The word literally means important. In the context of the thesis, it stands for the importance of food in the lives of students living in the hostels. The food they eat decides the quality of life they have in Kota and also makes them capable enough to pursue their studies with devotion and concentration.
15. **Exorbitant<sup>23</sup>**: The literal meaning of the word is too much expensive. In the context of the thesis, it refers to the kind of money hostels and restaurants are charging for offering their services. Though the quality they are offering is not exactly up to the mark, still the prices being charged are too much and beyond certain families.
16. **Plethora of amenities<sup>24</sup>**: The city of Kota is offering various facilities to the students coming for coaching and the term refers to umpteen facilities that are being offered for the benefit of students. The variety that is available in terms of facilities has been referred to as a plethora of amenities.
17. **Catering<sup>7</sup>**: The literal meaning of the word is serving. During the course of thesis the word has stood for serving and fulfilling the routine needs of students like their meals, daily milk, mobile recharges and wafers that they need on a regular basis. The word refers to the services that are up on offer for the students of Kota.
18. **Congested<sup>8</sup>**: The word refers to those regions of Kota where majority of coaching institutes are running. Since these areas are crowded with students, they have been defined as congested. The literal meaning of the word is crowded and in the context of the thesis it refers to areas where a

bulk of students is residing. In a way, it has been used to describe Kota as a place where students are so many in numbers that the market places and residential areas are mostly occupied by them only.

- 19. Flourishing<sup>10</sup>:** The word refers to expanding and prospering of various businesses in Kota. Since Kota has developed as a coaching industry, a lot of auxiliary businesses have set up shops and are now doing a roaring business in terms of attracting clients and generating revenues. Thus, in the context of the thesis, many businesses have flourished in Kota as a result of Expansion of Coaching industry.
- 20. Affluent<sup>25</sup>:** The literal meaning of the word is rich and prosperous. In the context of the thesis, the word refers to costly brands and services that are coming to Kota and the fact that there are families in Kota that could afford them now. The word affluent in a way talks about the prevalence of rich families in Kota who could bear the expenses of this costly city.
- 21. Inconceivable<sup>25</sup>:** The word refers to something that can't even be thought of. The literal meaning of the word is unthinkable. In the context of thesis it has been used to describe certain costly product brands that were practically not even visible in Kota a few years back but now there are exclusive showrooms of those brands in Kota, all because of the emergence of Kota as a rich city.
- 22. Monotonous<sup>26</sup>:** The word literally means boring which of course describes the kind of food that is available at hostels and paying guest houses. Students find the food at hostels to be of the same kind that is offered everyday without much of a variation being tried which of course gets unbearable for the students in the long run.
- 23. Dubious<sup>10</sup>:** The word literally means doubtful. In the context of the thesis, it refers to the ration that is being used to cook food at the messes. The ration being used is of a suspicious quality. It is substandard to a large extent and may even be harmful. The word has been used to describe the doubtful standard of food that is being served to the students at hostels.
- 24. Adulterated<sup>10</sup>:** The word literally means food that is impure as it is mixed up with elements that don't stand the test of standards. Adulteration is a

common malaise amongst the hostels of Kota as the food being offered to the students is not of the right standards as it actually should be, which is ultimately harming the health of students.

- 25. Unhygienic<sup>10</sup>:** The word literally means unclean and dirty. It refers to the food that is being served to the students. It is being cooked quite carelessly without much heed being paid to the norms of cleanliness. Food actually should be hygienically prepared, vegetables should be washed, chefs should avoid touching it directly with hands and this is what makes the food presentable and worth eating.
- 26. Adolescence<sup>27</sup>:** The word literally means the phase of transition between childhood and adulthood. The age group between 13 to 20 are adolescents as they undergo several physical, hormonal, emotional and physiological changes over a period of 5 to 6 years. This period is marked with a dynamic turn around that a youngster goes through which may sometimes become difficult to handle.
- 27. Biochemical<sup>26</sup>:** In the context of the thesis, the word refers to the secretion of hormones that gets accelerated with the advent of adolescence. The adolescents grow with a rapid fire pace that brings along with it a spurt of hormonal imbalances that can be referred to as the biochemical upheaval. It brings in its wake, a sudden change in the way adolescents think, behave and react to stimuli that they are exposed to.
- 28. Metabolism<sup>27</sup>:** The word refers to the breaking down of food into energy which is a process that maintains the way a person gets about his life and the energy he requires to balance that routine. Metabolism is a function that is the most vital to a human body as it ensures a steady flow of energy that an individual needs to perform his routine in an effective way. Metabolism depends to a large extent on the lifestyle of a person, and the food he normally intakes.
- 29. Erratic<sup>28</sup>:** The literal meaning of the word is something that is not regular or properly scheduled. In the context of the thesis, it refers to the eating pattern of adolescent girls which is absolutely disorderly. They have no fixed time for any meal. They skip their meals or consume it at odd hours

which to a great extent affects their metabolism and thereby the normal course of life.

- 30. Vulnerable<sup>29</sup>:** The word literally means a greater likelihood of falling a victim to an ailment. In the context of thesis the word has been used to indicate that the students staying at hostels have a greater probability of succumbing to ailments of sorts as compared to those who are staying with parents.
- 31. Macronutrients<sup>5</sup>:** The word has been used to refer to the major nutrients that a human body needs to sustain a healthy growth. As such, Carbohydrates, proteins and fats have been known to be a part of the macronutrient category and are the major nutrients that affect the pattern of growth. In the context of the thesis, the word refers to the most important factors that impact the overall well being of the child.
- 32. Micronutrients<sup>5</sup>:** The word literally means nutrients like vitamins, minerals and water. In the context of the thesis, the word refers to those nutrients that play a supplementary role in keeping an adolescent fit and healthy. These nutrients impact the quality of life the girls live while being away from parents. Though, macronutrients strengthen the bodily framework, micronutrients improve the children qualitatively.
- 33. Vitamins<sup>5</sup>:** The word as we all know is modified and is a combination of the two words vital and amines which means all those amines which need to exist in a human body in the right proportions so as to keep it elegant and fit. Vitamins are often classified into many types as the research has already indicated.
- 34. Calories<sup>5</sup>:** The word calorie is a layman's unit for energy that a human requires for going about his life. Every meal and food type consists of certain calories which may or may not be required for the health and well being of an individual and that's the reason some calories are classified as necessary and some are described as unnecessary.

## References

1. Rajasthan Patrika,(Sep. 2015),Coaching sansthano ki Maya.(Pg.No.2)
2. Times of India(2014), The Coaching Business in Kota. .(Pg.No.7)
3. Hindustan Times(Feb 2015), The Real State Business in Kota. .(Pg.No.4)
4. Dainik Bhaskar(Dec.2015)Kota me Hostel business ka uday(Pg.No.3)
5. Times Magazine,(Feb 2015), Chocolates have been described to be major health deterrent (Pg.No.17)
6. Sukhneet Suri and Anita Malhotra(2012), Food Science, Nutrition and Safety, Pearson Pvt.Pubilcation,Delhi
7. Mahtab S. Bamji, N.Pralhad Rao, Vinodini Readdy(1998), Textbook of Humann Nutrition, Oxford & IBH Publication Co.Pvt. Ltd., New Delhi.
8. New York Times(Sep 2012),The role of Vitamin C in Fighting stress WHO Report
9. British Journal (2013), Cure young girls of Obesity, Lighterlife Publication
- 10.N.Shakuntla Maney, M Shadaksharaswamy, (1997),Foods Facts and Principles, New Age International Publishers.
- 11.The Hindu (Sep 2013), Effect of Starvation on Young Girls of India.(Pg.No.10)
- 12.Famina(Sep 2014),Causes of Acne and Pimples in Adolescents,(Pg.No.27)
- 13.American Diabetes Association,(June 2013) A ratio of insulin to bodyweight.
- 14.American Academy of Opthamology and American Optometric Association
- 15.International Journal of Scientific Research,(Jan 2012), ‘Effect of nutrition counseling on junk food intake and anthropometric profile among adolescent girls of working mothers’ Vol.2, Issue 5.
- 16.American Journal of Life Sciences March 2010, High Sugar diet amongst the young Girls.

17. Gopalan.C.B.V.shastri and S.C.Balasubramanian.1989.Nutritive Value of Indian Foods. Indian Council of Medical Research, Hyderabad: National institute of Nutrition.
18. Gafoorunossa and K. Krishnaswamy. 2002 Diet and Heart disease. Hyderabad: National institute of Nutrition.
19. Ahmed,Farunk, Momtaz Zareen, Moudadar Karn, Banu Rehman, Pervin Cadi, Mohamad Haq, Jadson Nazmul and A. Alan.1998. "Dietary Pattern, nutrient intake and growth of adolescent school girls in urban Bangladesh." Public Health nutrition.
20. Tarvinder Jeet Kaur, G.K.Kochar and Tanu Agarwal. 2007. "Impact of Nutrition Education On Nutrition adequacy of Adolescent Girls."
21. B.Shrilakshmi. Dietetics.(1999) Second addition New Age International Publishers.
22. Sumati R. Mudambi, M.V.Rajagopal. Fundamentals of foods, Nutrition and Diet therapy New Age International Publishers.
23. Mary Story and Michael D. Resnick. Adolescent' view on Food and Nutrition-a Study.
24. Pallavi Barooah 2012. "Adolescent' Nutrition, Attitudes and Practices.
25. ICMR.1999. Recommended dietary intake for Indians. Indian Council of Medical Research, New Delhi
26. Jelliffe D B 1966. The Assessment of Nutrition of the community.World Health Organisation Monograph series No.53, Geneva.
27. Arora .R.K (2006)Meals and Health Care(96-104)
28. Jenifer L. Harris, John A. bargh,and Kelly D. Brownell (2009) health psychology vol. 28 ,no. 4,404-413
29. Joshi.A Shubhangini (2010) Nutrition and Dietetics
30. Sharma Nirja;(2006)Nutrition and Nutrition status (128-138)
31. Srilakshmi. B (april1999) DIETETICS, New age international (p) limited, publishers New Delhi.
32. [https://www.nlm.nih.gov/pubs/cd\\_hum.nut.html#2](https://www.nlm.nih.gov/pubs/cd_hum.nut.html#2)National Institutes of Health, Joint Collection Development Policy: The National Agricultural

- Library, The National Library of Medicine, The Library of Congress, February 27, 1998, Updated October 14, 2014. Retrieved on 2014-12-13
33. "What is an RDN and DTR?". *Academy of Nutrition and Dietetics*. Retrieved May 9, 2015.
  34. <http://www.iaacn.org/>The International & American Associations of Clinical Nutritionist, 2014, Retrieved 2014-12-14
  35. "FAQs about CNS Certification – Certification Board for Nutrition Specialists". Retrieved 2015-09-24.
  36. Whitney, Ellie; Rolfes, Sharon Rady (2013). *Understanding Nutrition (13 ed.)*. Wadsworth, Cengage Learning. pp. 667, 670. ISBN978-1133587521.
  37. Obesity, Weight Linked to Prostate Cancer Deaths – National Cancer Institute. Cancer.gov. Retrieved on 2011-10-17.
  38. Obesity and Overweight for Professionals: Causes | DNPAO | CDC. Cdc.gov (2011-05-16). Retrieved on 2011-10-17.
  39. Metabolic syndrome – PubMed Health. Ncbi.nlm.nih.gov. Retrieved on 2011-10-17.
  40. Omega-3 fatty acids. Umm.edu (2011-10-05). Retrieved on 2011-10-17.
  41. What I need to know about Eating and Diabetes – National Diabetes Information Clearinghouse. Diabetes.niddk.nih.gov. Retrieved on 2011-10-17.
  42. Diabetes Diet and Food Tips: Eating to Prevent and Control Diabetes. Helpguide.org. Retrieved on 2011-10-17.
  43. Osteoporosis & Vitamin D: Deficiency, How Much, Benefits, and More. Webmd.com (2005-07-07). Retrieved on 2011-10-17.
  44. Dietary Supplement Fact Sheet: Vitamin D. Ods.od.nih.gov. Retrieved on 2011-10-17.
  45. Brody, Jane E. (March 19, 1998). "Osteoporosis Linked to Vitamin Deficiency". *The New York Times*. Archived from the original on 2008-03-09.

46. Payne-Palacio, June R.; Canter, Deborah D. (2014). *The Profession of Dietetics*. Jones & Bartlett Learning. pp. 3, 4. ISBN 978-1-284-02608-5.
47. Gratzner 2005, p. 36-41.
48. Daniel 1:5–16. Biblegateway.com. Retrieved on 2011-10-17.
49. McCollum, Elmer V. (1957). *A History of Nutrition*. Cambridge, Mass.: The Riverside Press (Houghton Mifflin). pp. 8–9.
50. *History of the Study of Nutrition in Western Culture* ( Rai University lecture notes for General Nutrition course, 2004)
51. Smith, Richard (24 January 2004). "Let food be thy medicine...". *BMJ*. 328 (7433): 0–g.doi:10.1136/bmj.328.7433.0-
52. Bhatt, Arun (January–March 2010). "Evolution of Clinical Research: A History Before and Beyond James Lind". *Perspectives in Clinical Research*. Indian Society for Clinical Research via US National Center for Biotechnology Information. 1 (1): 6–10. ISSN 2229-3485. PMC 3149409 . PMID 21829774.
53. Willett, Walter C. with Skerrett, Patrick J. (2005) [2001]. *Eat, Drink, and be Healthy: The Harvard Medical School Guide To Healthy Eating*. Free Press (Simon & Schuster). p. 183. ISBN 0-684-86337-5.
54. Hopkins, F. Gowland (1912). "Feeding Experiments Illustrating the Importance of Accessory Factors in Normal Diets" (PDF). *The Journal of Physiology*. 44 (5–6): 425–460. doi:10.1113/jphysiol.1912.sp001524. PMC 1512834. PMID 16993143. Retrieved March 15, 2016.
55. "Carpenter's table gives the year each vitamin was proposed, the year isolated (shown here), the year the structure was determined, and the year that synthesis was achieved. Carpenter, Kenneth J. (October 1, 2003). "A Short History of Nutritional Science: Part 3 (1912–1944)". *The Journal of Nutrition*. 133 (10): 3023–3032. PMID 14519779. from Combs, G. F., Jr (1992). *The Vitamins: Fundamental Aspects in Nutrition and Health*. Academic Press. ISBN 0123819806.

56. Carpenter, Kenneth J. (November 1, 2003). "A Short History of Nutritional Science: Part 4 (1945–1985)". *The Journal of Nutrition*. 133 (11): 3331–3342. PMID 14608041.
57. Conlan, Roberta; Elizabeth Sherman (October 2000). "Unraveling the Enigma of Vitamin D" (PDF). *National Academy of Sciences*. Retrieved June 13, 2016.
58. Subcommittee on Vitamin Tolerance, Committee on Animal Nutrition, National Research Council (1987). "Vitamin E, in Vitamin Tolerance of Animals". *National Academy of Sciences*. Retrieved December 22, 2013.
59. "F.B.I. Joins Hunt for Young German Chemist". *San Bernardino Daily Sun*. December 18, 1940. Retrieved December 22, 2013.
60. "USDA's Food Guide Pyramid Booklet, 1992" (PDF). *United States Department Of Agriculture*. Archived from the original (PDF) on August 24, 2014.
61. Contagious obesity? Identifying the human adenoviruses that may make us fat. Science Blog
62. Montouri, Paulo; Triassi, Maria; Sarnacchiaro, Pasquale (2012). "The consumption of genetically modified foods in Italian high school students". *Food Quality and preference*. 26 (2): 246–251. doi:10.1016/j.foodqual.2012.05.004.
63. Nestle, Marion (2013) [2002]. *Food Politics: How the Food Industry Influences Nutrition and Health*. University of California Press. p. 413. ISBN 978-0-520-27596-6.
64. Fuhrman, Joel (2014). *The End of Dieting*. Harper One (Harper Collins). pp. 101–102. ISBN 978-0-06-224932-6.
65. "Get the Facts on Fiber". *webmd.com*.
66. "Strange but True: Drinking Too Much Water Can Kill". *Scientific American*. June 21, 2007.
67. "Can shipwrecked men survive if they drink sea water?". *Natural History Magazine*.

68. Berg J, Tymoczko JL, Stryer L (2002). *Biochemistry* (5th ed.). San Francisco: W.H. Freeman. p. 603. ISBN 0-7167-4684-0.
69. Otto, H (1973). *Diabetik Bei Diabetes Mellitus*. Bern: Verlag Hans Huber.
70. Crapo, P; Reaven, Olefsky (1977). "Postprandial plasma-glucose and -insulin responses to different complex carbohydrates". *Diabetes*. 26 (12): 1178–1183. doi:10.2337/diabetes.26.12.1178. PMID 590639.
71. Crapo, P; Kolterman, Waldeck; Reaven, Olefsky (1980). "Postprandial hormonal responses to different types of complex carbohydrate in individuals with impaired glucose tolerance". *Am J Clin Nutr*. 33 (8): 1723–1728. PMID 6996472.
72. Jenkins, David; Jenkins, Alexandra L.; Wolever, Thomas M.S.; Thompson, Lilian H. and Rao, A. Venkat (February 1986). "Simple and complex carbohydrates". *Nutritional Reviews*. 44 (2): 44–49. doi:10.1111/j.1753-4887.1986.tb07585.x.
73. "The Nutrition Source: Carbohydrates". Harvard School of Public Health. Retrieved 2011-07-07.
74. American Dietetic Association; Dietitians Of, Canada (2003). "Position of the American Dietetic Association and Dietitians of Canada: Vegetarian diets". *JADA*. 103 (6): 748–765. doi: 10.1053/jada. 2003. 50142. PMID 12778049.
75. "Healthy Water Living". BBC. Retrieved 2007-02-01. Archived from the original on 2007-01-01.
76. Food and Nutrition Board, National Academy of Sciences. Recommended Dietary Allowances, revised 1945. National Research Council, Reprint and Circular Series, No. 122, 1945 (Aug), pp. 3–18.
77. Le Bellego L, Jean C, Jiménez L, Magnani C, Tang W, Boutrolle I (2010). "Understanding fluid consumption patterns to improve healthy hydration". *Nutr Today*. 45 (6): S22–S26. doi:10. 1097/ NT. 0b 013e 3181 fe4314.

78. "FAO Corporate Document Repository. Food Balance Sheets- A Handbook." Retrieved 2011-03-07
79. "WHO Technical Report Series. Diet, nutrition and the prevention of chronic diseases." Report of a Joint WHO/FAO Expert Consultation; Geneva 2003. Retrieved 2011-03-07
80. *Mitchell, DaKota; Haroun, Lee (2012). Introduction to Health Care (3 ed.). Delmar Cengage. p. 279. ISBN 978-1-435-48755-0.*
81. *Nelson, D. L.; Cox, M. M. (2000). Lehninger Principles of Biochemistry (3rd ed.). New York: Worth Publishing. ISBN 1-57259-153-6.*
82. *Shils, M. S.; et al., eds. (2005). Modern Nutrition in Health and Disease. Lippincott Williams and Wilkins. ISBN 0-7817-4133-5.*
83. *Campbell T.; Campbell T. (2005). The China Study. Dallas: Benella Books. ISBN 1-932100-38-5.*
84. *Andrew Mente; Lawrence de Koning; Harry S. Shannon; Sonia S. Anand (2009). "A Systematic Review of the Evidence Supporting a Causal Link Between Dietary Factors and Coronary Heart Disease". Arch Intern Med. 169 (7): 659–669. doi: 10.1001/archinternmed.2009.38.PMID 19364995.*
85. *Eckel RH, Borra S, Lichtenstein AH, Yin-Piazza SY (April 2007). "Understanding the complexity of trans fatty acid reduction in the American diet: American Heart Association Trans Fat Conference 2006: report of the Trans Fat Conference Planning Group". Circulation. 115 (16): 2231–46. doi: 10.1161/CIRCULATIONAHA.106.181947.PMID 17426064.*
86. *Ducimetière P, Lang T, Amouyel P, Arveiler D, Ferrières J (January 2000). "Why mortality from heart disease is low in France. Rates of coronary events are similar in France and Southern Europe". BMJ. 320 (7229): 249–50. doi: 10.1136/bmj.320.7229.249/a. PMC 1117444 .PMID 10642245.*

87. Woodside JV, McCall D, McGartland C, Young IS (2005). "Micronutrients: dietary intake v. supplement use". *The Proceedings of the Nutrition Society*. 64 (4): 543–53. doi: 10.1079/ PNS2005464. PMID 16313697.
88. Bjelakovic G; Nikolova, D; Gluud, LL; Simonetti, RG; Gluud, C (2007). "Mortality in randomized trials of antioxidant supplements for primary and secondary prevention: systematic review and meta-analysis". *JAMA*. 297 (8): 842–57. doi:10.1001/jama.297.8.842. PMID 17327526.
89. Sepkowitz, Kent (3 August 2011). "The Doctor and the Pomegranate". *Slate*.

## Chapter - II

### REVIEW OF LITERATURE

## **REVIEW OF LITERATURE**

The research is a detailed study of life that adolescent girls live in the hostels of Kota and thereby lots of literature had to be scanned and referred to before presenting the study in an impressive format. Though what we researched was in depth enough and carried lots of weight, still the literature we referred to gave us a useful insight into the nutrition that adolescents need, the nutritive value of food that is required for a healthy life and also what all nutrients they commonly lack in their routine. The literature that we took cognizance of gave us an overview of the kind of food adolescents love to eat, the nutrients these foods contain or lack and what makes a meal healthy and effective. Thereby reading certain eminent authors provided us some vital clues to go about the study. The reviews have been categorized on certain basis. The categories they have been broken into can be classified as follows:

- A . Studies related to Nutritional status
- B. Studies related to Health and Behavioural problems
- C. Studies related to Dietary Patterns
- D. Studies related to Nutrition Counseling, Social and Psychological Factors, etc.

### **A . STUDIES RELATED TO NUTRITIONAL STATUS**

**Garg Meenakshi, Rajesh Vidya, Kumar Pawan, (2014),** ‘Effect of Breakfast skipping on nutritional status and school performance of 10 to 16 years old children of Udipi district.’

The study has solely focussed on the breakfast skipping habit of adolescents and children which according to the researchers is a public health concern. Breakfast has been medically known to be the most important meal of the day and a lot depends on the quality of breakfast, the micronutrients it contains and to what extent it is contributing to the BMI status of an adolescent.

Skipping a breakfast leads to serious dietary inadequacies as a child doesn't get to consume an important when he requires it the most. It's very well known that a breakfast that is not sufficiently balanced impacts the health adversely and may even lead to irreversible ailments. The study took 195 school going adolescents between the age group 10 to 16 as subjects from the district of Udipi and interviewed them through a set questionnaire. It was found that breakfast skipping is pretty common among youngsters and around 23.05% adolescents were found skipping their breakfasts. Certain strange facts sprang up through the study like more number of breakfast skippers were found to be overweight as compared to the ones who took regular breakfasts. These breakfast skippers were also found avoiding fruits, vegetables and cereals which contain nutrients vital to the overall health of adolescents rather they were detected to be gorging upon junk food that is known to be high on saturated fats and thereby absolutely harmful which explains why the adolescents who skip breakfast compensate for that by having meals that adversely affect their health.

**Aliga Sulakshana S, Naik Vijaya A, Mallapur Maheshwar S, (2014),** 'Nutritional status of adolescent girls residing in rural area: A community-based cross-sectional study'.

The study was conducted in certain villages of Belgaum district of Karnataka to evaluate the nutritional status of adolescent girls in rural areas. Around 400 girls between 10 to 19 in age group were chosen as subjects and were exposed to a standard questionnaire seeking answers on their routine dietary intake. The interview that the girls went through sought enough answers to validate the dietary habits of these girls. Apart from the regular questionnaire, a 24 hour recall method was also brought into use to ascertain with what intervals they ate and the nutrients that constituted their regular meals. Based on their responses, their nutrient intake was calculated. It was found that majority of the girls had a distorted dietary intake and close observations revealed that the intake was 50% less than the Recommended Dietary Allowances (RDA) which reflected quite negatively on their eating habits. This erratic consumption resulted in 3/4<sup>th</sup> of the girls being anaemic and malnourished.

**Omobuwa O, Alabiosu CO, Adebimpe WO, (2014),** ‘Assessment of nutritional status of in-school adolescents in Ibadan, Nigeria’.

As per a WHO report, adolescents have been defined as youngsters between 10 to 19 in age and are the most significant section of the society. As adolescents of today will be tomorrow’s adults thus their health is crucial to the overall well being of any nation. The study was conducted to assess the nutritional status of school going adolescents as they are the ones who suffer the most when it comes to nutrition. This is an age when children need quality nutrition that caters to the growth requirement of their bodies. As there is a sudden spurt of growth in this age, it requires supplements and nutrients a little more than any other section of the society. Around 93 adolescent girls were chosen as subjects from schools of Ibadan. The sample consisted of 29 males and 64 females and was exposed to a well structured questionnaire. Their anthropometric measurements were recorded for an analysis and respective BMI were calculated which on average turned out to be less than 18.5 Kgm/m<sup>2</sup>. Around 1/3<sup>rd</sup> of respondents were detected to be underweight. Under nutrition is a common problem amongst the adolescents and can be rectified only through continual nutritional education imparted to adolescents.

**Mushtaque Shah Afsheen, Memon Allah Nawaz, Laghari Arshad Hussain, et all, (2013),** ‘Nutritional Assessment of Hostel Residential and Non Hostel Residential boys and girl students of Sindh University, Jamshoro, Sindh, Pakistan.

The study was conducted to assess and compare the nutritional status of hostel and non hostel living students at the University of Sindh. The study has focussed on the importance of balanced diet and has highlighted the fact that even the lack of a single important nutrient may cause a fatal disease. Around 50% of Hostel and 50% of non Hostel living girls between the age group 20 to 24 were selected as subjects. Non Hostel living students were the ones living with parents. A questionnaire was used to collect data to gather information on the demographic and socioeconomic conditions the respondents belonged to. Further anthropometric measurements were recorded like height and weight so as to calculate BMI for all the students. It was found that the students living

with parents had a proper diet as they were getting to eat nutritious food whereas students living at the hostel were used to gorging upon snacks and deep fried stuff without much of a resistance. Cold drinks that consist of a lot of sugar are quite common among hostel living students quite unmindful of the fact that they only add on to their weight. They are quite unaware of a balanced diet and majority of what they eat is just unhealthy.

**Mosarrof Hossain GM, Sarwar Md.Tanwir, Rahman M.Hafizur, Rouf Shaikh MA, (2013),** 'A study on nutritional status of the adolescent girls at Khagrachhari district in Chittagong hill tracts, Bangladesh.

This study was conducted with 300 adolescent girls between 10 to 19 years of age chosen as subjects from Khagrachhari district of Chittagong hill tracts in Bangladesh. Around 66% out of these were from the rural areas of Chittagong whereas the rest 34% were from the urban areas. A general questionnaire revealed that around 65% amongst them had a low food intake as compared to the average intake in this age and about 41% of them were underweight. It was shockingly observed that 15% of them got married during adolescence as a result of lack of parental awareness. As far as awareness is concerned, the major sources were TV, radio and newspapers which made the girls aware about the need to have a healthy nutrition and the role it plays in the overall balanced growth of a girl's body. A survey threw up the fact that mass media improved the awareness by 43.33%, a sizeable percentage considering how poor the district is.

**Mishra CP, Shukla KP, (2013),**

'Correlates of Nutritional status of Adolescent girls in the rural areas of Varanasi'. The study was conducted in the Chiraigaon region of Varanasi district with 207 adolescent girls between 10 to 19 years in age chosen as the subjects. The study aimed at finding out the relation between the socioeconomic status of the family, the demographics, the surrounding environment and the nutritional status of girls. The girls were exposed to a general questionnaire and a 24 hour recall method that sought answers on questions pertaining to their eating habits, their preferences and the nutrients they could recognise while consuming a certain diet. Their BMI was recorded

and was compared to their responses so as to make a fair assessment of their dietary intake. It was found that education played a vital role in shaping up the diets of girls. It was a revelation that girls from families with good literacy levels were less likely to be malnourished as compared to girls from families with lower literacy levels. It was also detected that educated fathers had healthy daughters with balanced BMI as compared to fathers with less education. Thus the study stumbled upon the fact that educational status of the family contributed a lot towards making their adolescent daughters healthier and fitter.

**Wasnik Vinod, Rao Sreenivas B, Rao Devkinandan, (2012),** ‘A study of the health status of early Adolescent girls residing in social welfare hostels of Vizianagram district of Andhra Pradesh, India’,

The study was conducted to assess the overall health status of adolescent girls. It is internationally known that adolescence is a period of rapid growth where massive changes occur in the girls thereby making it quite difficult for them to cope up. Apart from the physical changes, girls have to bear physiological changes which may cause them a lot of mental stress. WHO has reported in one of its journals that around 1/10<sup>th</sup> of adolescent population in India is undernourished. The aforesaid study took 420 girls living in social welfare hostels between the age group 10 to 15 years as its subjects. These social welfare hostels are known for the shoddy and unhygienic food offered to the young girls. The girls were tested with predesigned questionnaires and were asked to respond to questions that sought answers on their routine dietary intake. Anthropometric measurements were recorded for a detailed analysis. Their BMI was calculated on the basis of their height, weight and waist statistics. It was found that 56.4% of the girls tested were undernourished and around 5.8% were overweight which justified the assumption that the food being served didn't just lack nutrition but was spurious as well.

**Hakim Abdull NH, Muniandy ND, Danish Ajau, (2012),** ‘Nutritional Status and eating practices among University students in selected Universities in Selangor, Malaysia’.

The study has focussed on the poor dietary habits of University students studying in various Universities of Malaysia. It is commonly found that University students tend to have poor eating practices as living away from parents makes them independent enough to choose a food of their choice and this also leads to a poor nutritional status among the students. Around 200 students from four different universities of Selangor with a mean age 20 were chosen as subjects for the study. 45% of these participants were males and the remaining 55% females. A well planned and designed questionnaire was handed over to the students that sought answers to questions pertaining to their routine dietary intake. Apart from that students were even asked to respond to a 24 hour recall questionnaire which gave a fair idea about their routine nutrient intake which was then pitted against the Malaysian Recommended Nutrient Intake (RNI). Their height, weight and waist measurements were recorded and their BMI status was calculated. Around 16.7% males and 20.9% females were found to be underweight. On the other hand 17.8% males and 10% females were found to be overweight. Majority of them were detected to be consuming fast food which resulted in all their dietary problems and digestive imbalances.

**Singh Sweta, Kansal Sangeeta, Kumar Alok, (2012),** ‘Assessment of nutritional status of adolescent girls in rural areas of district Varanasi’,

Adolescence is supposed to be an intensely sensitive period when the need for almost all the nutrients is a little more than at any other time in life. This is an age when poor eating habits and unawareness of nutritional adequacy is the most. Especially in the rural areas where the adolescents are not brought up in an atmosphere where they are taught the significance of a healthy nutrition right from their childhood. Poor families are at a great disadvantage as poverty usually leads to malnutrition as was stated in the 1994 report of WHO. The study was conducted to assess the nutritional status of adolescent girls. Around 650 adolescent girls, 15 to 19 years in age were chosen as subjects and were made to go through a predesigned interview schedule. Also their anthropometric measurements were recorded like their height and weight. It was found that around 16.3% of the subjects had a strong tendency of getting

obese whereas in certain poor families under nutrition was a major problem. The research concluded that there was an urgent need to impart a quality nutritional education to the adolescents in rural areas so as to bring about a change in their health status.

**Maiti Soumyajit, Chatterji Kaushik, Kazi Mounjar Ali, Ghosh Debidas, Paul Shyamapada, (2011),** ‘Assessment of Nutritional status of rural early adolescent school girls in Dantan-II block, Paschim Medinipur district, West Bengal’,

The study was conducted to evaluate the growth and nutritional status of adolescent girls in the rural areas of West Bengal. In these poor rural areas of West Bengal, poverty is prevalent and a majority of the families residing in these impoverished areas don't have an easy access to quality amenities in terms of either food or education. Around 3611 girls from 5<sup>th</sup> to 8<sup>th</sup> standard (10 to 14 years in age) were chosen as subjects from 18 different government schools of Medinipur district and their anthropometric measurements were recorded for an analysis. Their height, weight and waist measurements were taken so as to assess their health in terms of food taken. For majority of these adolescents, height and weight measurements were below the standard values for this age and this was all because of malnutrition. Only 28.2% students had normal weight and 65.2% students had normal height. To a large extent it was found that many of these girls in their early adolescence suffer malnutrition of a severe order and require a healthy nutrition to combat the scourge of under nutrition.

**Gaiki Varun, Wagh Vasant, (2011),** ‘Nutritional status of adolescent girls from selected rural area of a district from central India’,

Adolescence is a phase when a youngster's body undergoes intense changes and it needs extra nutrients to cope up with these changes. There is a serious need to develop a database on the diet of adolescents so as to use it later beneficially while formulating policies for the well being of adolescents. The subjects chosen were adolescent girls, 15 to 19 in age from a rural district in Maharashtra. They were interviewed as per a set schedule through a

questionnaire that consisted of household questions to collect socio-demographic information. The anthropometric measurements of girls were recorded for analysis and their height and weight were taken into consideration. Around 30.39% girls were found stunted which indicated under-nutrition was very common amongst these rural girls. Intervention is required to address the problem of under-nutrition and malnutrition. A scheduled nutritional education and targeted awareness programs are required to improve nutritional status of rural girls.

**Dhingra Rajni, (2011)**, ‘An assessment of health status of adolescent Gujjar tribal girls of Jammu district’.

The study was conducted to evaluate the health status of tribal adolescent Gujjar girls in and around the district of Jammu. Around 200 adolescent girls, 13 to 15 in age were chosen as subjects for the study. The girls belonged to Nomadic as well as semi-Nomadic Gujjar tribe. The girls were handed over a questionnaire to assess their regular dietary habits and their routine food preferences. Along with that, they were tested for anaemia, malnutrition, hypertension and respiratory rate. Gujjar girls around the district of Jammu are emotionally as well as physically tough as they grow up exposed to regular hard and rigorous work. Still there was a high percentage of girls with a low BMI, almost around 88% girls were found with a BMI less than normal which indicated malnutrition. This is all a result of poor economic status which most of the families suffer which often leads to girls not getting enough nutritious food to keep them healthy. This prolonged lack of nutrients makes the girls malnourished and very much vulnerable to chronic ailments. A sustained approach to curb the menace of malnutrition is required. It might also entail awareness programs and nutritional education for girls of these poor tribes.

**Prashant K, Shaw Chandan, (2009)**, ‘Nutritional status of adolescent girls from an urban slum area in South India’,

The research was conducted over a period of 2 months in a slum area of south India with a special motive of assessing the dietary patterns of slum living poor girls as it's pretty well known that poverty afflicts majority of these slum areas and getting to consume a good diet seems to be next to impossible for

these poor slum dwellers. Around 223 girls, 10 to 18 in age from a south India were chosen as subjects and were interviewed through a predesigned and structured and questionnaire with questions that sought answers about their routine diets. Even their parents were questioned regarding the kind of profession they pursued and what normally they included in their regular meals or rather what all could they practically afford in their limited means. Even the anthropometric measurements of the girls were taken as per the recommendations of WHO and their height, weight and waist measurements were recorded for an analysis. It was assessed that around 6.7% of these girls were illiterate. The data recorded was analysed through statistical tools like the mean and Standard Deviation and the results seemed to be pathetic. Around 47% of the girls had a stunted growth which means their height was much less than the average for this age. 42.6% of the girls were found to be underweight which indicated that under nutrition was quite prevalent amongst the slum dwelling children. These adolescent slum girls need a serious intervention and awareness program to uplift their nutritional status and put them at par with girls of their age.

**Dey I, Biswas R, Ray K, Bhattacharjee S, Chakraborty M, Pal PP, (2007),** 'Nutritional status of school going adolescents in a rural block of Darjeeling'.

The study was conducted in the Naxalbari area of Darjeeling district in West Bengal with 420 school going adolescents (out of which there were 39% girls) as subjects. The aim of the study was to assess the nutritional status of adolescents from poor rural families without much access to quality hygienic nutritious food. It was observed that around 40% of tested adolescents were under nourished. Further, it was also found that 44% of adolescents had a stunted growth and 14% amongst them were severely stunted. The study included recording their anthropometric measurements including their height, weight and BMI so as to compare with the average measurements for the given age group. In such poor households, malnutrition is a common malaise and is the root cause of all the ailments including stunted growth and lack of vital nutrients. If adolescents get to stay hungry for prolonged periods, it even affects their mental health which may deteriorate with the passage of time.

**Shahid A, Siddiqui FR, Bhatti MA, Ahmed M, Khan MW, (2006),**

'Assessment of nutritional status of Adolescent college girls at Rawalpindi'.

The study was conducted at two girls colleges at Rawalpindi with 508 adolescent girls chosen as subjects. The study aimed at appraising the routine dietary intake of girls with special emphasis on carbohydrates and proteins. The idea was to pursue the study with a keen eye on malnutrition. Also important was the objective to assess whether the girls were consuming ample quantities of Vitamin A, iron and iodine or were there some traces of visible deficiency of these important nutrients. The result was disturbing as it revealed that 20% of the girls had a below average BMI and around 57% of girls were reeling with goitre which indirectly aimed at iodine deficiency. Though the responses were invited through a questionnaire and a 24 hour recall method, it clarified a lot. Certain biochemical tests also exposed the fact that 32% of them were suffering from anaemia resulting out of iron deficiency. The research overall indicated a less than healthy diet that most of the girls were getting to consume thereby affecting a balanced lifestyle.

**Woodruff BA, Duffield A, (2002),** 'Anthropometric assessment of nutritional status in adolescent populations in Humanitarian emergencies'.

The study was conducted by WHO in the war and calamity affected areas of Europe, Central Asia and Africa. The study focussed on the Adolescents as they have been defined by the WHO as the most sensitive chunk of the population between 10 to 19 years in age. It is estimated by the WHO that adolescents between 15 to 19 in age require 2420 Kcal of energy in a day which is just an ideal figure as most of the adolescents in war ravaged countries get much lower than that. Apart from the energy needs, they need micronutrients like Vitamin A, Vitamin B<sub>12</sub>, folic acid, iodine and thiamine. Further, as stated by the WHO, adolescent girls 10 to 14 in age require higher levels of Calcium because of a growing body. It was also found that majority of adolescent girls suffer under-nutrition and other chronic deficiencies as a result of low nutrient intake. Their routine diets may not be as healthy and satiating as is required in this growing age with rapid hormonal changes which are difficult to cope up with for an unhealthy adolescent. Under-nutrition may

result in adverse health outcomes in the later age as immunity majorly develops in adolescence as a result of healthy and nutritious food and if it doesn't, it becomes pretty difficult to overcome ailments in a growing age.

**A.Saibaba, M.Mohan Ram, GV Ramana Rao, Uma Devi, TS Syamala. (2002)** 'Nutritional status of Adolescent girls of urban slums and impact of IEC on their Nutritional knowledge and Practices'. The study was strategically conducted in certain known urban slums of Hyderabad and Secunderabad with around 2500 girls chosen to be the subjects of the research. During the course of research, it was observed that their heights and weights didn't match the ICMR standards and in fact the deficit in these anthropometric measures grew with age. Almost all the girls in the slums were found to be deficient in calcium and iron and thereby majority of them were anemics. The study was interventional in nature and the girls were suggested to start consuming food rich in calcium and iron. As it's reported in the journal, a marked difference was observed over a period of time and the girls reacted positively to the stimuli. The given sample of girls was assessed for their heights, weights, and other anthropometric measures as was deemed fit for the study. Their haemoglobin count was noted to be put against the changed count as was expected after the study. The intervention proved to be highly efficacious and impacted a substantial change in the health and nutritional status of the slum girls. The above research was quite helpful and going through it guided us to a certain extent as to how such studies are conducted and what is required to make the data collection more effective and directed.

**Wang Y, Popkin B, Zhaif F, (1999)**, 'The nutritional status and dietary pattern of Chinese adolescents',

The study was conducted to develop an understanding about the current dietary patterns of adolescents residing in China. The study has also focused on the issue of striking a relationship between economic change and adolescent nutrition in a lower income country. Around eight provinces of China were chosen for the study. All these eight provinces were strategically different from each other in terms of economic development, geography and public resources. About 2236 girls, 10 to 18 years in age were selected as

subjects and were asked to respond to a questionnaire that aimed at getting answers about the routine diets of adolescents. They were also exposed to a 24 hour dietary recall method and this gave the researchers a fair idea about the dietary preferences of Chinese adolescents. It was found that under-nutrition afflicted around 12 to 13% of the adolescent population which was considered low to a large extent. The problem of being overweight was found amongst young, high income adolescents though the occurrence of this problem was as low as 4%. Intervention brought about an improvement in the nutritional status of Chinese adolescents but under-nutrition is still a big problem amongst the Chinese youngsters.

**K Anand, S Kant, S.K Kapoor (1998),** 'Nutritional status of Adolescent school children in rural North India'.

The study was conducted with subjects belonging to 25 different schools in villages of Punjab. It was found that the mortality rate amongst the adolescents between 13 to 19 is the lowest amongst all the age groups but these adolescents have a high rate of malnutrition and anaemia. Since they don't get to eat healthy and nutritious food because of lack of resources, they are found severely deficient in important nutrients like iron and calcium. They are found seriously lacking in important vitamins which consolidate the immunity systems. Even the essential amino acids, fats and proteins which form the basic bodily framework of an adolescent are found missing with these youngsters thereby making their bodies very much fragile and quite vulnerable to common ailments.

**K.Venkaiah, K.Damyanti, MU Nayak, K.Vijayraghavan, (1996-97),** 'Diet and Nutritional status of rural adolescents in India'.

The study was conducted in and around the villages of Hyderabad in Andhra Pradesh. Around 120 villages were earmarked out of eight different districts of Andhra Pradesh and then 20 households were chosen out of each village. It was found that majority of adolescents in these households were stunted and malnourished. Their nutritional status wasn't up to the mark. It was shockingly detected that a vast majority of adolescent girls in these families were married before the age of 18 which impacted their physical as well

sexual health adversely. They were found to be much shorter than the average height for their age group. When their regular nutrient intake was compared to the RDA figures (Recommended Dietary Allowances), it was found sorely lacking in the most vital of all the nutrients which resulted in most of the adolescents being underweight. Even the most vital of all the vitamins were found missing in their diets causing them all kinds of nutrition related ailments.

**Ghalib J. Haboubi, Rizwana B. Shaikh, (1996)** ‘A comparison of nutritional status of adolescents from selected schools of South India and UAE’.

The study was conducted across the vast Indian Diaspora living in the Middle East. The study covers adolescents of Indian origin studying in the schools of UAE and it assesses the impact of alien socio-economic factors on their health. The adolescents surveyed were 10 to 19 years old as they are in a transitional phase, and it is such a phase when their bodies undergo tremendous hormonal changes as they travel from childhood to adulthood. These adolescents were tested with simple anthropometric parameters and were found severely deprived of essential nutrients and as a result suffering from malnutrition and anaemia. Since they are getting to live in such an ethnic environment which is quite different from their own, it leads to several changes in their dietary patterns which in the long term may prove to be detrimental to their health. Majority of such children were found with a stunted growth and also lacking vital elements in their regular diets.

**Popivanova Ts, Uzunova A, Mineva T, (1994)**, ‘The impact of the hostel life style on the health status of students’.

The study has focussed on the social living conditions, psychosocial elements and other factors that affect the health status of students living in the hostels of Sophia, the capital of Bulgaria. The researchers worked on 1034 students living in hostels chosen as subjects and were exposed to 69 questions that sought answers on the living conditions in hostels, education provided to students, the living standard that commonly prevails at the hostels and the daily regimen that most students have to follow while living at the hostel. It was found that hostel students were more reckless as compared to students

living with their parents and were more exposed to unhealthy and unhygienic food that's commonly available at the hostels which often caused them gastrointestinal problems which even turned chronic over a period of time. Some of these hostel living students even suffered cardiovascular ailments and were found to be visiting medical practitioners more than the students living with parents.

## **B. STUDIES RELATED TO HEALTH AND BEHAVIOURAL PROBLEMS**

**Joglekar A, Verma V, Sharma G, Bhoi S, (2015),** 'Prevalence of Anaemia among college going girls of Raipur City'.

The study was conducted to appraise the nutritional status of college going girls in the city of Raipur, Chattisgarh. Anaemia is one amongst the most serious problems afflicting the women across the world and girls in India are the major sufferers. It is estimated that more than 50% of adolescent girls across the world suffer mild or severe anaemia. In developing countries, haemoglobin levels are found much lower in girls as compared to girls in developed countries which indicates a poor diet low in important nutrients. Less consumption of iron rich food has been known to be the single biggest reason behind anaemia amongst adolescent girls. The study was conducted with 178 girls between 18 to 25 in age as subjects and was asked to respond to a set of questions to assess their daily intake of nutrients. The analysis of data gathered revealed that around 63.48% of respondents were anaemic. The figure includes girls suffering from mild to severe anaemia. Continual nutritional education and awareness programs can bring about a serious improvement in the girls suffering the symptom of iron deficiency. Nutritional awareness programs may aim at educating the girls about the reasons behind the sudden fall in the levels of haemoglobin and the measures in terms of diet that could be taken to effectively counter the prevalence of this ailment.

**Singh Sunita, Gururaj Gopalkrishna,(2013)** 'Health behaviours & problems among young people in India: Cause for concern & call for action.'

The study has focussed on the issue of youngsters 10 to 24 years in age considering them one of the major human resources for the development of the country. The authors believe that people of this age group are the most vulnerable section of the society engaging in highly risky behaviours, the use of alcohol, tobacco and involving in sexual adventures which may cause them injuries, mental trauma and certain irreparable losses to health. Lack of proper nutrition may be one of the reasons why youngsters of this age group suffer such problems. It may either be over nutrition or malnutrition that troubles the youngsters a lot. These health risks that the youngsters engage in may have a lasting impact on their psyche and body. The study has expressed concern about the fact that these youngsters are a valuable resource but because of their reckless behaviour pertaining to health and safety, this resource is getting wasted, either falling a victim to accidents of life threatening injuries. They require a constant boost to their morals, awareness about a healthy lifestyle, a constant reminder through some programs that their life is not there to be wasted rather it's a phase of life that needs to be nurtured and groomed with utmost care.

**Sheldon Lynne (2013), ' why are adolescents experiencing a premature greying of hair',**

The research conducted by Lynne Sheldon has seriously focused on the issue of sudden greying of hair in young adolescents and she has directly blamed lack of folic acid for this abnormality. According to the study folic acid is vital to many bodily processes and a deficiency of this nutrient can not only slow the growth of hair in adolescents, it can also turn the hair grey but much before they actually should. Timely increase in folic acid levels may help the hair grow naturally and retain their original colour in adolescents. Folic acid works with Vitamin B9 in improving the hair follicles. Both of these are abundantly found in green leafy vegetables, root vegetables, beet root, cereals and grains which most adolescents today avoid. It is found that even lack of vitamin C can cause the hair to turn grey and for adolescents around 90 mg of vitamin C daily can prove to be pretty much helpful in avoiding this occurrence of greying of hair. To a certain extent, the lifestyle of today's

adolescents can also be blamed for this disorder, too much of junk food, erratic eating habits, lack of sleep have also been found a bit responsible for this but lack of proper nutrients appears to be ultimately responsible factor for this disorder.

**Trivedi Shubha Sagar, (2012), 'Health concerns among Adolescent girls'.**

The study has highlighted the common concerns that adolescent girls often have to go through in their conduct of day today life. Adolescence is the most vulnerable age as these girls are quite likely to go through changes that seem problematic and unacceptable. Their overall growth and development takes place in this age and that's why adolescence is a period marked and characterised by too many physical, reproductive and psychological changes. It's commonly found that undernutrition and anaemia constantly trouble adolescents because of their erratic lifestyle. 1/3rd of the adolescent girls are known to be underweight and 56% of them suffer from anaemia which predominantly occurs due to iron deficiencies. A severe deficiency of iron may also lead to menstrual abnormalities which also result in lack of concentration in studies. Some opulent adolescents are known to suffer from obesity as they find it difficult to keep a check on their nutrient intake. Adolescents may easily pick infections because of a lack of hygiene during menstrual cycles, they may easily get into bad habits like alcohol consumption and risky sexual behaviour. A large percentage of adolescents in India don't have an easy access to healthcare facilities which puts them at an even greater risk of contracting infections.

**Gilsanz Vincente, Kremer Arye, Ashley O.Mo, Kremer Richard, (2011), 'Vitamin D status and its relation to muscle mass and muscle fat in young women',**

Across the world deficiency of Vitamin D is considered to be a major medical problem especially among young women. The deficiency of vitamin D is known to result in increased in increased body fat and decreased muscle strength. The research was conducted to study the relationship between 25-hydroxyvitamin D (250 HD) and fat infiltration in muscles. Around 90 females 16 to 22 years in age were chosen as subjects and were tested on

certain parameters. The fat concentration of their body was calculated, later their muscle mass and the percentage of muscle fat was recorded for an analysis later. Around 59% of the subjects were found to insufficient and also deficient in 250 HD to a large extent. Around 41% were found to be sufficient in 250 HD. The problems that occur with the lack of 250 HD are multi fold and may later lead to severe repercussions beyond control.

**Dubey Arvind, (2010), 'Health for adolescent girls'.**

The study was conducted to bring to notice and highlight the tribulations adolescents go through as they grow up. As this is an age where lots of changes occur in them hormonally and make it difficult for them to cope up with the pressure of these changes. This is an age when they can neither be considered adults nor kids. It's even much tougher for the adolescent girls as much is expected out of them. Lack of knowledge and skills makes them susceptible to risky behaviour like getting into relationships, sexually reckless decisions, avoiding meals, smoking, substance abuse and frequent consumption of alcohol. Though they are relatively healthier as compared to other age groups, this careless lifestyle doesn't affect them much initially but if it carries on for a while, it may lead to irreversible losses. Lack of awareness regarding sexual health seems to be one of the major reasons behind this state of pathos. Risk of pregnancy in adolescence as they don't have much knowledge about protection often puts adolescent girls into emotional and physical trauma which may turn out to be irreparable in nature.

**Sajjan Jyoti.T (2008) , 'Consumption pattern of green leafy vegetables and impact of nutrition education on haemoglobin status of rural adolescent girls'.**

This study was institutionalized for adolescent girls in the age group 13 to 16 in the rural areas adjoining Dharwad district. The study came up with pretty much depressing results. Almost all the girls were found to be anaemic which meant their regular diets lacked important nutrients like iron. When checked, it was detected that their diets didn't contain green leafy vegetables which are rich in iron. Almost all the girls were found to be shorter than the average heights for that age. Around 2 villages were chosen for an interventional program and 75 girls from each village were selected to undergo the

counseling. The counseling lasted 3 months and the results were monitored and were found to be utmost positive. The girls counseled had started consuming green leafy vegetables and there was a remarkable improvement in their health. A lot of them were found to have overcome anaemia and had even gained weight thereby proving the efficiency of intervention

**Tiwari Priyanka, Sankhala Aarti, (2007),** 'Prevalence of obesity, weight perception and dietary behavior of urban college going girls'.

The study was conducted with about 1000 girls between 18 to 24 in age chosen as subjects from different colleges of Udaipur to study about the malaise of obesity that afflicts large number of girls today. Most of the girls chosen were from middle and higher middle income group and thereby access to junk outside was pretty convenient to them. Around 30 girls were selected from all the three groups, i.e normal, overweight and obese. The idea behind the study was to assess their dietary behavior and weight perception. It was found that around 55% of the girls had a big misconception about their weight and were shocked to learn that they were in the category of obese. A survey to assess their dietary pattern revealed that almost all the obese and overweight girls were very much habitual of butter, jam, jelly, cheese and mayonnaise, almost all foods that are rich in fats. Even soft drinks contain excessive sugar which contributes a lot towards obesity. Though most of the fatty foods are energy dense but since majority of these girls have a sedentary life style, these foods contribute more towards weight.

**Bulliyya Gandham, Mallick Gitanjali, Sethy Girija Shankar, Kar Santanu Kumar, (2007),** 'Haemoglobin Status of non school going adolescent girls in three districts of Orissa, India'.

The study was undertaken with three different districts of Orissa as the domain chosen for the research. The objective was to find out to what extent anaemia affects the non school going girls from very poor families. Around 1937 adolescent girls 11 to 19 in age group were selected as subjects and their haemoglobin levels were recorded. Along with that their common anthropometric measurements were taken for an analysis. It was shockingly found that 1866 girls out of the chosen sample were anaemics with around 5

percent reeling under severe anaemia. It was directly connected to the parents' educational background and other socioeconomic factors. Since they were not going to schools, it was directly correlated to lack of education. The family income with scarcity of knowledge seemed to be the major reasons why so many girls were found to be suffering such badly. Lack of nutritious food and paucity of awareness programs contributed to a large extent to make the girls anaemic which clearly indicated a need for more research and better directed programs to resolve the problem.

**Kotecha, Prakash.V, Karkar, Purvi and Nirupam, Siddhartha (2005),** 'Adolescent girls anaemia control program'.

This program was initiated by the Government of Gujarat, through the Medical College of Vadodara. The girls chosen as subjects for the study were adolescent girls 13 to 19 in age from 30 different schools in and around Vadodara. Around 10 were from urban areas, 10 from rural areas and 10 from tribal areas. Their Haemoglobin levels were taken and majority of them were found to be anaemic. They were counselled through the IEC program instituted by the government which aimed at educating the girls about the right and healthy nutrition. Their post counseling session blood samples revealed a major change in their haemoglobin levels. The samples taken before counseling estimated around 53.2% girls to be anaemic whereas there was a reduction of 21.5% in this figure once the counseling was over. Haemoglobin levels rose the maximum in rural areas which indicated that the impact of IEC was the maximum in rural areas.

**Clay Daniel, Vignoles Vivian L, Dittmar Helga, (2005),** 'Body image and Self esteem among Adolescent girls'. Testing the influence of Socio-cultural factors'.

The study has focussed on the issue of self esteem, which seems to be a sensitive factor amongst the adolescents of today. It's commonly seen that the adolescents relate themselves more with models and film stars rather than real life heroes. They are primarily obsessed with media images of feminine beauty and have a concept of looks that's more unrealistic than anything that belongs to the real world. Especially young girls have a more than ideal

concept about feminine beauty. The study took into consideration 136 adolescent girls between 11 to 16 in age as subjects. An analysis of their responses to questions gave a fair idea about the inferior body image that girls carry between the age group 12 to 17. This is the age when maximum bodily changes occur due to hormonal imbalances which may often lead to acne and pimples and may bring about a drop in the self esteem of the girl. Self esteem in this age can be defined as either a negative or positive attitude towards oneself. This is an age when comparison with good looking models is common and appearance is supposed to be the most important factor deciding how a girl carries herself among her peers. Advertising images of ultra thin models with shapely features may inspire the girls to be like them and can even provoke them to bring unbearable changes in their diets which can be seriously detrimental to their health in the long run. Adolescent girls need support in the form of awareness programs that may help the girls to deconstruct media images and think more realistically.

**Chaubey and Chakravarty (2004-2005),** ‘A Comparative study of Nutrient intake in adolescent girls’.

The study was conducted on adolescent girls between the age group 16 to 20, living in the hostel of Banaras Hindu University, Varanasi pursuing various courses. Around 50 girls were chosen for the study that was conducted to calculate the average nutrient intake by girls of this age. It was found that girls in this age lack healthy dietary habits as their eating habits are more governed by extrinsic factors rather than the factors that really influence their health. Moreover these young girls are under a severe peer pressure and looking good for them is a priority. There is a tendency amongst the girls to gain weight and if pointed out they may go for a crash diet thereby hampering their intake of important nutrients. This may cause them a lot of harm in the long run. The study focused on the need to consume healthy nutritious food with a schedule coupled with adequate physical activity so as to be in a good physical health. Further girls have to undergo several hormonal changes as they cross over from adolescence to adulthood. This again requires them to eat well which

improves their immunity thereby making them fit to face any physical or mental outrage.

**Harris Jennifer L., Bargh John A, Brownell Kelly D.(2003),** ‘Priming Effects of Television food advertising on eating behavior’.

The study was conducted by the above given researchers of the Yale University to assess the effect of food advertising on TV on the eating behavior of the children. It’s commonly observed that watching somebody eat something delicious or sumptuous titillates our taste buds and may even provoke us to go for something that could satiate our immediate need to eat something. TV advertisements on snacks may instantaneously inspire adolescents to go for snacks and this sudden feeling is intense enough to force the children to gorge upon anything they could lay their hands upon. It was found during the course of the research that there was an increase of 45% in the number of adolescents eating snacks as they were exposed to advertisements of foods. Snacks are known to make the children obese gradually and if they are in the habit of watching TV advertisements on food, it may enhance their craving for snacks and thereby result in an increase in weight.

### **C. STUDIES RELATED TO DIETARY PATTERNS**

**Shabnam Omidvar, Khyrunnisa Begum, (2014),** ‘Dietary pattern, food habits and preferences among adolescent and adult student girls from an urban area, south india’.

The study was conducted in the Mysore region of Karnataka with around 1000 girls between the age group 11 to 28 as subjects to assess their eating habits. It is commonly seen that obesity and anorexia are major problems amongst the school and college going girls nowadays and it is all because of the fact that dietary patterns have changed amongst the girls across the world. Girls have started accepting food that seems convenient as it gives them the freedom to eat what they wish without any schedule quite unmindful of the fact that such

an erratic dietary pattern may lead to cancer and coronary heart diseases. The girls were exposed to a questionnaire demanding answers on their regular meals of preference and their BMI was recorded. The data collected showed disturbing signs. It was found that 50% of the adolescent girls were underweight as they were discovered to be skipping their meals. Further, 68% of the girls were found to be consuming fast foods daily which exposed them to digestive disorders of several kinds. Nutritional status of almost all the girls was detected to be disorderly as a result of their undisciplined lifestyle.

**Kotecha P.V, Patel Sangita V, Baxi R.K, Mazumdar V.S, Misra Shobha, Mehta K.G, Diwanji Mansi, Modi Ekta, (2013), 'Dietary pattern of schoolgoing adolescents in urban Baroda',**

Adolescence is considered to be that phase of life that is the most important and thereby healthy eating habits play an important role in the overall physical well being of an adolescent. It is such an age when an adolescent has to bear the dual burden of under-nutrition and over-nutrition. The study was conducted to assess the food habits, food preferences and dietary patterns of school going adolescents of Baroda city. The survey was quantitative as well as qualitative in nature. Around 1440 adolescents from classes 6 to 12 were chosen as subjects from 30 different schools of Baroda and were exposed to a questionnaire to evaluate their eating habits and the routine they followed while consuming different meals. It was found that around 80% consumed regular meals like dal, rice, chapatti and green leafy vegetables. Around 50% consumed chocolates and 1/3<sup>rd</sup> consumed fast foods almost 2 to 3 times a week. Almost 60% confessed to having breakfast on a regular basis and the remaining missed their breakfast. These adolescents need a serious intervention program so as to inculcate in them a habit of consuming healthy and hygienic meals which are not erratic but scheduled.

**Bazhan Marjan, Kalantari Naser, Houhiar-Rad Anahita, (2013), 'Dietary habits and nutrient intake of girls in Northern Iran',**

Rapid changes in lifestyle, Industrialization and westernisation have brought about a massive change in the food habits of adolescents across the world. Not much of data is available on the dietary intake of adolescents, thus a study

needs to be conducted to assess that. Around 400 adolescent girls, 14 to 17 in age were chosen as subjects in Lahijan area of Northern Iran. A Questionnaire was handed over to them seeking answers on their food frequency and food preferences. Through a 24 hour dietary recall method, their routine intake of carbohydrates, proteins and fats was calculated so as to get a tentative idea about their regular energy intake. Analysis of data revealed that Vitamin A, vitamin D, calcium and phosphorus were much below the RDA (recommended dietary allowances) which reflects negatively on the dietary habits of girls. Most of the girls confessed not consuming fresh vegetables and fruits on a routine. Adolescents need to be motivated to go for fresh food for a healthy lifestyle.

**Alavi M, (2013),** 'Dietary habits among adolescent girls and their association with parental educational levels',

Adolescence is a period of rapid physiological development and gradual appearance of secondary sexual characteristics and that is the reason why nutrients are required the most in this age of dynamic change. It's commonly seen that parental education matters the most in affecting the eating habits of adolescents. The study was conducted with 386 adolescent girls randomly selected as subjects. A questionnaire was used to assess the knowledge of girls regarding major nutritional problems. The data gathered was analysed to reach a conclusion. It was found that around 48.4% didn't take breakfasts at all. 67.4% consumed bread and cereals on a regular basis and 57.5% girls consumed fruits and vegetables. Lack of parental literacy was found to be the single biggest reason that affected healthy eating habits of adolescents. It was also detected that majority of the nutritional knowledge came through teachers and counsellors and for the adolescents to eat healthy, parents need to be educated.

**Musaiger A.O, (2010),** 'Nutritional habits and dietary habits of adolescent girls in Oman',

Around 683 adolescent girls, 11 to 18 in age were chosen as subjects for the research from 5 different geographical regions of Sultanate of Oman. Their height, weight and dietary patterns were recorded through a pre-designed

questionnaire and BMI was calculated to be analysed later. It was found that 24% of the girls were underweight as a result of lack of healthy nutrition. Further, 12% girls were found to be overweight or obese. Around 21% girls were found to be skipping their breakfasts. It was detected that younger adolescents consumed breakfasts more than elder adolescents. These adolescents from Oman had almost similar habits as that of western adolescents as a result of active westernization of the whole of Middle East. Many of these adolescents are found to be suffering from diet related chronic diseases. The study concluded that a serious interventional program is required to inculcate awareness among the adolescents to go for healthy food as this is an age when carelessness regarding one's diet is the most and majority of adolescents are found casually skipping their meals and avoiding healthy and nutritious food in favour of junk food that lacks vital nutrients.

**Dr.K.Munisumitha (2010)**, 'A study on the health status of adolescent girls residing in the social welfare hostels of Nellore city'.

The study was conducted to assess the nutritional status of adolescent girls. Majority of these girls were found to be deprived of proper healthcare and nutritious food. Since they are living in social welfare hostels, they don't get to eat food rich in vital nutrients as a result of which they have to suffer common immunity related ailments. It's not just healthy food they are devoid of, they even miss quality education and employment opportunities. Most of the girls were diagnosed deficient in iron and other important vitamins vital to the overall upkeep of human health. This reduces their immunity and makes them very much prone to routine ailments. The study highlighted the physical and mental trauma these girls residing in social welfare hostels have to go through, a lot due to lack of proper healthy nutrition

**Rao D Raghunath, Vijayapushpam T, Rao GM Subba, Antony GM, (2007)**, 'Dietary habits and effect of two different educational tools on the nutritional knowledge of school going adolescents in Hyderabad, India'.

The study was conducted in Hyderabad to assess the dietary habits and nutritional knowledge levels of adolescent girls from different schools and to study the efficacy of 2 different educational tools in improving their

knowledge of nutrition. Around 164 adolescent girls, belonging to 10<sup>th</sup> grade were chosen as subjects for the purpose of research. These girls belonged to 4 different secondary schools of Hyderabad. They were subjected to two different interventional programs to educate them about the positive effects of healthy nutrition. Intervention-1 consisted of educating these adolescents through a traditional method using print media like charts, folders and leaflets. At a later stage, intervention-2 was used to educate the adolescents, it comprised using audio-visual CD demonstrating the effect of healthy food. Majority of these adolescents consumed aerated drinks, bakery items and fast foods quite recklessly whereas they consumed fruits and green leafy vegetables quite moderately. It was noticed that intervention-2 didn't work well as intervention-1 had already brought about the desired change in their dietary patterns.

#### **D STUDIES RELATED TO NUTRITION COUNSELING, SOCIAL AND PSYCHOLOGICAL FACTORS, etc.**

**Singla Priya, Sachdeva Rajbir, Kochhar Anita, (2012),** 'Effect of nutrition counseling on junk food intake and anthropometric profile among adolescent girls of working mothers'.

The study was conducted in the city of Ludhiana with sixty adolescent girls between 16 to 18 in age chosen as subjects from 2 different schools. All the girls had one thing in common; they had working mothers which made the girls a little independent in their choices regarding food. Majority of the girls were found quite fond of junk food and they admitted to spending a big chunk of their pocket money on junk food which means their maximum energy intake is out of junk only. Around 86.7% of the given number of subjects were regular consumers of junk food and a lot of girls amongst them were found a bit obese, slightly heavier than the standard BMI. The girls were counseled for a period of three months regarding the repercussions of junk food and were also advised to go for a regular diet of green leafy vegetables, milk and milk products. The counseling session proved to be somewhat effective and when

the girls were contacted three months later, some girls actually showed signs of improvement, some of them had consciously given up eating junk and were on a diet of salads and green vegetables at least once a day. Some of them had quite innovatively switched over to healthy junk like noodles with lots of vegetables.

**Saxena N, Chopra N, Gupta A, (2016),** ‘A study on dietary intake of college going girls residing at home, hostel or as a paying guest’.

The study was conducted in and around the districts of Agra to assess the dietary patterns followed by college going girls. Around 200 girls between 18 to 24 in age were chosen as subjects and were given a questionnaire to respond to. Their anthropometric measurements were recorded for analysis like BMI, height, weight and MUAC (mid upper arm circumference). It was found that majority of hostel living girls had unhealthy dietary habits as compared to girls living with parents. Most of girls staying as paying guests were found snacking on a regular basis. Quite on the contrary, girls staying with parents had healthy consumption habits. It was detected many of them consumed fruits, green vegetables, milk and milk products on a regular basis, foods which hostel living girls never even thought about. Girls staying with parents followed a schedule while eating whereas girls staying as paying guests had an erratic pattern of consumption to a large extent which contributed a lot towards ill health. Even on the index of weight, girls staying at hostels were at a certain disadvantage as compared to girls with parents. Majority of the girls at hostels were either underweight or overweight which in itself meant that their dietary intake was absolutely imbalanced. Either they consumed too much of something or ignored something nutritious completely.

**Barooah Pallavi, (2012),** ‘Adolescents’ nutrition, attitudes and practices’.

The study was conducted around certain common districts of Rajasthan, with adolescent girls between 13 to 19 in age so as to develop an insight into the unhealthy eating habits of youngsters which often lead to ailments that otherwise could have been avoided. It was observed while accumulating the data that the eating habits of youngsters in this age group are governed by factors that are quite extrinsic like the physical changes that normally occur in

young girls in this age and also the changes in lifestyle that the young girls are gradually adopting as a result of active westernization of culture and consumption patterns. The biggest problem with the girls of this age group is the peer pressure that they have to commonly encounter which makes them a lot self aware regarding their looks and the need to look good so as to impress others. Staying in college for long hours, away from parents, develops in them a tendency to skip meals and compensate for that by consuming snacks. Eating junk like pizzas and burgers with lots of soft drinks and coffee and avoiding important nutrients like calcium and iron gradually takes a toll on their immunity. Most of the girls were found to be anaemic and a lot exposed to routine disorders.

**Ganasegran Kurubaran, qureshi Ahmad M, Rizal AM, Aljunid Syed M, (2012), 'Social and Psychological factors affecting eating habits amongst University students in a Malaysian medical school'.**

Eating habits are a vital determinant of a student's health status. The study was conducted to assess the pattern of eating habits and associated social and psychological factors amongst the students studying in a medical school of Malaysia. Around 132 students between the age group 18 to 30 were chosen as subjects and exposed to a questionnaire consisting of questions on socio-demography, anthropometry and routine eating habits. It was found that around 56% of the students had regular breakfasts but the remaining were lethargic in terms of taking meals and suffered as a result. Also a big majority amongst the respondents admitted to smoking and drinking on a routine and were found to be consuming fast food at least thrice a week which was adversely affecting their health. It was observed during the interview that many of them lacked knowledge of good eating habits despite being medical students. To a large extent it was due to a mental stress and the lack of time which seriously affected their healthy eating habits. It was not just the healthy eating habits which was found lacking, it was also the constant habit of snacking which affected their health a lot. Snacks are high on oil and students staying away from parents don't have anybody to guide them to eat better.

**Monika, Sadia Chisty, Kanika Verma, (2011),** ‘Fast food consumption pattern among postgraduate female student living in hostel of University of Rajasthan, India’.

The study was conducted to evaluate the fast food consumption pattern amongst young girls. Over the years fast food has become a rage amongst the youngsters and is gradually getting them addicted to it. Around 104 girls between 20 to 26 in age group were chosen as subjects and were exposed to a questionnaire, a simple Performa with questions seeking information on the general dietary intake of girls. Further, the anthropometric measurements of all the girls were recorded for the purpose of informed analysis. Their BMI, height, weight and waist measurements were taken and noted. A 24 hour recall method was adopted to get a fair idea about routine dietary intake of girls. It was shockingly observed that majority of the girls were consuming fast foods 2 to 3 times a day. Analysis later revealed that 64% of the respondents were normal in their weights but around 10 % were overweight and 10% absolutely obese. The overweight and obese girls were found to be consuming fast foods with a frequency much higher than others and were least interested in any kind of physical exercises which resulted in extra ounces of fat they had put on. A need was felt to make the girls aware about the lethal effects of fast food and the problems it may put the girls into if they consumed it regularly.

**Sharma Renu Bala, Hardikar Monika, (2010),** ‘Effect of socioeconomic factors on physical fitness of college going girls’.

The study was conducted in Sagar, a town in M.P with a bustling population. Around 200 girls between the age group 18 to 23 were chosen as subjects to find out to what extent physical exercises impact the overall fitness of adolescent girls. The girls were asked to respond to questions seeking answers regarding their routine physical activities and whether they engaged in some sort of physical sport in order to keep themselves fit. Certain facts that came up during the process of research were quite shocking as it showed the lack of interest the girls had in any kind of physical activity. For many amongst these girls, lifestyle was absolutely sedentary and walking was the only activity that they pursued. Around 37.5% girls did some mild exercises 20 to 30 minutes a

day, 3 to 5 times a week. About 21 out of 200 girls admitted to walking as the only activity they performed in the name of exercises. It was also detected that most of the girls from lower income groups were the least bothered about exercises and weren't aware about the significance of sports in keeping the girls fit. Thus socioeconomic factors played a major role in keeping the girls fit and agile.

**Goyle Anuradha, (2009), 'A profile of families of girls studying in a government school in Jaipur City',**

The research was conducted to study the profile of girls studying in a govt. school in Jaipur. An interview schedule was set up with girls to get some relevant information about their families and the occupation of their parents. Around 148 girls in the age group 10 to 16 were chosen as subjects for the study. The interview held with them revealed certain shocking facts like majority of their family members were illiterate and were employed as daily wagers. Some fathers were construction workers, tailors, vegetable vendors and auto rickshaw drivers. Even mothers were found to be working as daily wage earners. Around 54% of the women contributed to the family income. Upon medical examination, it was found that girls were suffering from ailments that could be stated as mild to severe. 79% of the girls had pale conjunctiva and around 4% of the girl respondents had visible goitre thereby indicating a deficiency of iodine. There was a serious deficiency of other important nutrients as well that were leading to certain complications that could be termed critical. Further nutrients like vitamin A and B complex suffered a deficiency thereby causing the girls to cope up with problems, some of which, out of them were irreversible in nature.

**Kaur Tarvinder jeet, Kochar GK, Agarwal Taru, (2007), 'Impact of nutrition education on nutrient adequacy',**

The study was conducted in the district of Solan, Himachal Pradesh with 60 girls between 13 to 19 years in age chosen as subjects. The study aimed at testing the nutritional adequacy of adolescent girls through time tested and reliable methods. A 24 hour recall method was adopted to assess the routine dietary intake of girls in terms of important nutrients. It was found that

majority of the girls were undernourished and were suffering from palpable nutrient deficiencies. They were imparted a planned counseling session so as to let them know about the best possible nutrition they could have to improve their overall well being. It was assessed later that their dietary intake improved dramatically as a result of counseling, also there was a significant improvement in their average intake of proteins, carbohydrates and other vital minerals and vitamins which indirectly proved that they had taken a special notice of that and worked hard to update their nutritional status. Thus nutrition education plays a significant role in keeping the youngsters fit and healthy enough to face the challenges.

## Reference

1. Kotecha, Prakash.V, Karkar, Purvi and Nirupam, Siddhartha (2005), 'Adolescent girls anaemia control program'.Journal of Health Population and Nutrition 490-496.
2. A.Saibaba, M.Mohan Ram, GV Ramana Rao, Uma Devi, TS Syamala. (2002) 'Nutritional status of Adolescent girls of urban slums and impact of IEC on their Nutritional knowledge and Practices' International Journal of Nutrition of Food Science.
3. Chaubey and Chakravarty (2004-2005), 'A Comparative study of Nutrient intake in adolescent girls' International Journal of Nutrition of Food Science.
4. Kaur Tarvinder jeet, Kochar GK, Agarwal Taru, (2007), 'Impact of nutrition education on nutrient adequacy', Home Community Science1(1) 51-55
5. Sajjan Jyoti.T (2008) , 'Consumption pattern of green leafy vegetables and impact of nutrition education on haemoglobin status of rural adolescent girls', Food Science and Nutrition (F&N)
6. K.Venkaiah, K.Damyanti, MU Nayak, K.Vijayraghavan, (1996-97), 'Diet and Nutritional status of rural adolescents in India' International Journal of Nutrition of Food Science.
7. K Anand, S Kant, S.K Kapoor (1998), 'Nutritional status of Adolescent school children in rural North India' International Journal of Nutrition of Food Science.
8. Ghalib J. Haboubi, Rizwana B. Shaikh, 'A comparison of nutritional status of adolescents from selected schools of South India and UAE' Food Science and Nutrition (F&N)
9. Dr.K.MunisuSmitha (2010), 'A study on the health status of adolescent girls residing in the social welfare hostels of Nellore city'Department of Community Medicine, Narayan Medical College, Nellore.
10. Bulliyya Gandham, Mallick Gitanjali, Sethy Girija Shankar, Kar Santanu Kumar, (2007), 'Haemoglobin Status of non school going adolescent girls

in three districts of Orissa, India' International Journal of Adolescent Medicine and Health.

11. Sharma Renu Bala, Hardikar Monika, (2010), 'Effect of socioeconomic factors on physical fitness of college going girls'. International Refereed Journal.
12. Singla Priya, Sachdeva Rajbir, Kochhar Anita, (2012), 'Effect of nutrition counseling on junk food intake and anthropometric profile among adolescent girls of working mothers' International Journal of Scientific and Research Publication, Vol.2, Issue 5.
13. Barooah Pallavi, (2012), 'Adolescents' nutrition, attitudes and practices', Basic Applied & Social Science, Vol. II.
14. Mosarrof Hossain GM, Sarwar Md.Tanwir, Rahman M.Hafizur, Rouf Shaikh MA, (2013), 'A study on nutritional status of the adolescent girls at Khagrachhari district in Chittagong hill tracts, Bangladesh, International Journal of Nutrition of Food Science.
15. Tiwari Priyanka, Sankhala Aarti, (2007), 'Prevalence of obesity, weight perception and dietary behavior of urban college going girls', Journal of Humanities and Ecological, 21(3)- 95- 101.
16. Harris Jennifer L., Bargh John A, Brownell Kelly D.(2003), 'Priming Effects of Television food advertising on eating behavior' Journal of Humanities and Ecological.
17. Dey I, Biswas R, Ray K, Bhattacharjee S, Chakraborty M, Pal PP, (2007), 'Nutritional status of school going adolescents in a rural block of Darjeeling' Indian Journal of Research Anvikshiki Publication.
18. Baliga Sulakshana S, Naik Vijaya A, Mallapur Maheshwar S, (2014), 'Nutritional status of adolescent girls residing in rural area: A community-based cross-sectional study' European Journal of Clinical Nutrition.
19. Shahid A, Siddiqui FR, Bhatti MA, Ahmed M, Khan MW, (2006), Assessment of nutritional status of Adolescent college girls at Rawalpindi' Food Science and Nutrition (F&N)

20. Mishra CP, Shukla KP, (2013), 'Correlates of Nutritional status of Adolescent girls in the rural areas of Varanasi', Indian Journal of Research Anvikshiki Publication, Vol.3, issue II.
21. Singh Sunita, Gururaj Gopalkrishna,(2014) 'Health behaviours & problems among young people in India: Cause for concern & call for action.', Indian Journal of Medical Research.
22. Dubey Arvind, (2010), 'Health for adolescent girls', Vigyan Prasar. Com.
23. Shabnam Omidvar, Khyrunnisa Begum, (2014), 'Dietary pattern, food habits and preferences among adolescent and adult student girls from an urban area, South India' Indian Journal of Fundamental and Applied Life Science.
24. Trivedi Shubha Sagar, (2012), 'Health concerns among Adolescent girls', International Journal of Scientific and Research Publication.
25. Monika, Sadia Chisty, Kanika Verma, (2011), 'Fast food consumption pattern among postgraduate female student living in hostel of University of Rajasthan, India', Journal of Dairying, Food and Home Science 34(4).
26. Saxena N, Chopra N, Gupta A, (2016), 'A study on dietary intake of college going girls residing at home, hostel or as a paying guest'. Remarking Vol III, Issue- I
27. Wasnik Vinod, Rao Sreenivas B, Rao Devkinandan, (2012), 'A study of the health status of early Adolescent girls residing in social welfare hostels of Vizianagram district of Andhra Pradesh, India', International Journal of Collaborative Research on Internal Medicine and Public Health Vol.4.
28. Clay Daniel, Vignoles Vivian L, Dittmar Helga, (2005), 'Body image and Self esteem among Adolescent girls'. Testing the influence of Socio-cultural factors' European Journal of Clinical Nutrition.
29. Joglekar A, Verma V, Sharma G, Bhoi S, (2015), 'Prevalence of Anaemia among college going girls of Raipur City', International Journal of Scientific Research 4(4) , 190-192
30. Woodruff BA, Duffield A, (2002), 'Anthropometric assessment of nutritional status in adolescent populations in Humanitarian emergencies' European Journal of Clinical Nutrition.

31. Omobuwa O, Alabiosu CO, Adebimpe WO, (2014), 'Assessment of nutritional status of in-school adolescents in Ibadan, Nigeria' *South African Family Practise*, 56 (4)1-5.
32. Mushtaque Shah Afsheen, Memon Allah Nawaz, Laghari Arshad Hussain, et all, (2013), 'Nutritional Assessment of Hostel Residential and Non Hostel Residential boys and girl students of Sindh University, Jamshoro, Sindh, *Pakistan Journal of Nutrition*, 356-364.
33. Garg Meenakshi, Rajesh Vidya, Kumar Pawan, (2014), 'Effect of Breakfast skipping on nutritional status and school performance of 10 to 16 years old children of Udipi district.' *MU Digital Repository, E- print Manipal. Edu/id/eprint/143715*
34. Popivanova Ts, Uzunova A, Mineva T, (1994), 'The impact of the hostel life style on the health status of students' *European Journal of Clinical Nutrition*.
35. Hakim Abdull NH, Muniandy ND, Danish Ajau, (2012), 'Nutritional Status and eating practices among University students in selected Universities in Selangor, Malaysia', *Asian Journal of Clinical Nutrition*.
36. Ganasegran Kurubaran, qureshi Ahmad M, Rizal AM, Aljunid Syed M, (2012), 'Social and Psychological factors affecting eating habits amongst University students in a Malaysian medical school', *Nutritional Journal*, Vol.II.
37. Gilsanz Vincente, Kremer Arye, Ashley O.Mo, Kremer Richard, (2011), 'Vitamin D status and its relation to muscle mass and muscle fat in young women', *US National Library of Medicine, National Institute of Health*.
38. Kotecha P.V, Patel Sangita V, Baxi R.K, Mazumdar V.S, Misra Shobha, Mehta K.G, Diwanji Mansi, Modi Ekta, (2013), 'Dietary pattern of schoolgoing adolescents in urban Baroda', *Journal of Health Population and Nutrition*, 31(4)490-496.
39. Maiti Soumyajit, Chatterji Kaushik, Kazi Mounjar Ali, Ghosh Debidas, Paul Shyamapada, (2011), 'Assessment of Nutritional status of rural early adolescent school girls in Dantan-II block, Paschim Medinipur district, West Bengal', *The Indian Journal of Research Anvikshiki*.

40. Prashant K, Shaw Chandan, (2009), 'Nutritional status of adolescent girls from an urban slum area in South India', Indian Journal of Pediatrics, Vol.76.
41. Goyle Anuradha, (2009), 'A profile of families of girls studying in a government school in Jaipur City', Journal of Social Science 18(2)-95-101.
42. Singh Sweta, Kansal Sangeeta, Kumar Alok, (2012), 'Assessment of nutritional status of adolescent girls in rural areas of district Varanasi', The Indian Journal of Research Anvikshiki.
43. Wang Y, Popkin B, Zhaif F, (1999), 'The nutritional status and dietary pattern of Chinese adolescents', European Journal of Clinical Nutrition.
44. Gaiki Varun, Wagh Vasant, (2011), 'Nutritional status of adolescent girls from selected rural area of a district from central India', International Journal of Medical Health Science.
45. Dhingra Rajni, (2011), 'An assessment of health status of adolescent Gujjar tribal girls of Jammu district', Food Science and Nutrition (F&N).
46. Musaiger A.O, (2010), 'Nutritional habits and dietary habits of adolescent girls in Oman', Ecology of Food & Nutrition Vol.3.
47. Rao D Raghunath, Vijayapushpam T, Rao GM Subba, Antony GM, (2007), 'Dietary habits and effect of two different educational tools on the nutritional knowledge of school going adolescents in Hyderabad, India', European Journal of Clinical Nutrition, 61, 1081-1085.
48. Bazhan Marjan, Kalantari Naser, Houhiar-Rad Anahita, (2013), 'Dietary habits and nutrient intake of girls in Northern Iran', Food Science and Nutrition(F&N)
49. Alavi M, (2013), 'Dietary habits among adolescent girls and their association with parental educational levels', Global Journal Health Science.
50. Sheldon Lynne (2013), ' why are adolescents experiencing a premature greying of hair', European Journal of Clinical Nutrition.

## Chapter - III

# RESEARCH METHODOLOGY

## **RESEARCH METHODOLOGY**

Research is an ongoing process based on many accumulated understandings and explanations that when taken together lead to the generalizations about problems and development of theories. It is the creation of new knowledge or the use of the existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings this could synthesize and analyze the previous research to the extent that it leads to new and creative outcomes. Whenever a research is conducted it can affect a subject both positively and negatively and can be constructive or destructive in nature. The significance of research is that it will be systematic arranged, summarized and recorded properly. Research methodology is a way to systematically solve the research problem.

The success of any investigation depends upon the selection of appropriate method and tools for the study of the problem. The method to be employed always depends upon the nature of the related problem and procurement of data for analysis and its solution. Thus, the chapter is subdivided under following heads:

- RESEARCH DESIGN
- TYPES OF RESEARCH
- RESEARCH DOMAIN
- SELECTION OF SUBJECTS
- TOOLS USED
- PROCEDURE USED FOR DATA COLLECTION
- FOOD INTAKE AND ANTHROPOMETRIC PARAMETERS
- NUTRITIONAL COUNSELLING
- INTERVENTION
- STATISTICAL ANALYSIS OF DATA GATHERED
- NULL HYPOTHESIS

## **RESEARCH DESIGN**

The research undertaken is an in depth study that cuts across student groups from varied cross sections of the society. Though these students may belong to almost matching socio-economic status and educational backgrounds, their interests, tastes and responses to given circumstances stand in a stark contrast. They can't be expected to react in a similar fashion when faced with the dilemma of choosing one out of the given choices. It's an observation conducted keeping in view that youngsters, though same in age, have likes and dislikes as different as chalk and cheese and a thorough research is required to eventually conclude as to how different they could ever be when it comes to making choices and whether these choices make a visible impact on the quality of life these youngsters are living. Since the whole study has been undertaken with a view to gain an insight into the eating habits of young girls residing in the hostels of Kota, the motivation behind this research has been the unavoidable fact that these young girls have been observed to be suffering ailments of varied nature and their visits to hospitals and medical practitioners is quite frequent. The study aims to bring to light the sense of pathos that plagues these girls, the physical trauma they endure, the meal they consume irrespective of its hygiene, the ailments they are afflicted with, the remedies they seek and the impact this all has on their bodies as well as their psyches. Since the whole study is a massive exercise in observation with certain complexities, it generates data and figures that have their own sets of variations and as such it demands a methodology to be sorted out comprehensively. Garnering data wasn't that tough, as simply accumulating figures is easy but putting that data to test is a challenge in itself. Data needs to be analysed with the right statistical tools so that it throws up results which facilitate the whole research. A right methodology enables a researcher to reach conclusions which are in tune with the decided hypothesis, somehow consolidate the belief that the research was conducted in the right earnest and also boosts the researcher to interpret the data qualitatively so that it could be capitalised upon if an intervention is required. The righteousness of the methodology even makes the data quite relevant to the researcher as it's actually worth all the pains he has gone through.

Eventually, it necessitates us to conceptualize the statement of problem ‘**An educational intervention to study nutritional status and dietary pattern of girls residing in hostels for coaching (with special reference to Kota city)**’.

## **TYPE OF RESEARCH**

We needed a relevant method to conduct our research and a certain category of research to go about and the type chosen by us is the Descriptive one. The simple reason being this type of research is used to describe in detail the characteristics of a population without taking into account as to why, when, where and how those characteristics occurred. In the case of the Experimental group, the 1050 adolescent girls chosen by us as subjects define the sample group amongst whom we have conducted the study but we are certainly not bothered as to why these subjects have such characteristics, what made them develop these characteristics. Our motto was to only get the details which helped us in getting a knack of their dietary habits which mattered a lot in making our figures worthwhile. So as to get about the process of collecting the data with an ease, we broke it into many simplified elements:

### **3.1 RESEARCH DOMAIN**

Kota, a city in Rajasthan, has been chosen to be the research domain as it is a rich hub of educational institutes which host students from across the country arriving the city for quality education. Majority of the girls coming to the city belong to almost similar economic backgrounds with little or not much of a difference between their socio-cultural values. These girls have proved to be an unmatched source of data as they have contributed rich insights into their eating habits, the change they normally crave for, afflictions they have to suffer and how it all affects their overall quality of life. Since these girls have been staying away from their parents for quite some time, they can be expected to have been through the rough of life and as such a reliable source of all the data available. Further, since the whole statistic revolves around hostels and paying guest facilities, it becomes

pretty convenient to approach hostels seeking information about the dietary habits of young girls. There are innumerable hostels almost in every nook of Kota, if fact in certain areas there are clusters of paying guest accommodations housing girls belonging to the remotest corners of India. As such, Kota turns out to be a fitting domain for the research offering an opportunity to throw up figures relevant to the study. Further, being a city that is now a home to lakhs of students coming from far and wide, it could boast of a large number of eating facilities offering foods and cuisines with varied flavors. This could serve as a valid reason to select Kota as a domain to work upon.

Since these girls belong to regions far and wide, arriving from almost every possible nook of the country, their likes and dislikes regarding food can't be expected to be almost the same given the famed diversity India is known for. The only bond between them is their age unified only through the ethos of youth, as a result of which the research stands to gain a lot as these girls can be anticipated to provide the best of data which could be qualitatively considered to represent the whole of India. Thus choosing Kota as the research domain has the advantage of taking a peek into the whole of the country.

### **3.2 SELECTION OF SUBJECTS**

Since the whole research is in fact a study of young girls residing in the hostels of Kota, the sample to be chosen to act as subjects have to be girls only. The study has majorly focused on the dietary habits of these girls staying away from their parents and as such beyond a semblance of control, the characteristics they exhibit while choosing what to eat and the turmoil they go through because of lack of proper nutrition. These girls could either be staying in hostels, paying guest accommodations or in rented rooms at humble dwellings where the people sublet a part of their homes for an extra ounce of earning. It's a comparative study where the meal consumption habits of these girls living in hostels are pitted against the dietary habits of outstation girls staying with parents and thereby under a constant supervision. Their movements across the city are continually monitored by their

parents and it could be safely assumed that even what they eat in their regular meals goes through a scanner. Parents worry about where they hang out and with whom and thereby the likelihood of consuming anything untoward seems to be a rare occurrence. The sample roughly chosen for the research is a random group of 1050 girls in the age group 13 to 25 living in the hostels of Kota. This random sample has been chosen out of a surveyed figure of 40,000 girls on record visiting Kota every year to prepare for the entrance exams of top medical and engineering colleges of India. These 40,000 girls can't be said to be evenly spread across the geographical spread of Kota, there being a few clusters where large numbers of hostels and paying guest accommodations have mushroomed over the years for the simple reason that these are the very places where majority of the coaching institutes are located. The sample of 1050 was chosen arbitrarily through a door to door visit at hostels and the girls were selected irrespective of any special consideration. Though a big chunk of these girls belong to middle class families, still the accommodations chosen by them are qualitatively different as per the affordability of their parents. These hostels can be broadly classified as AC Hostels, Non AC hostels and paying guest accommodations where the rents vary as per the luxuries offered. The survey which was painstakingly executed threw up some loose figures that could be tabled methodically breaking the figure of 35,000 into the categories mentioned above. Almost simultaneously, this sample was asked to respond to queries regarding their regular consumption pattern and places where they prefer taking their regular meals. Either it's the nearest tiffin center that delivers a tiffin routinely at a fixed hour or a nearby mess where they walk down every day for their meals or the paying guest accommodation where the family they stay with, offers them meals the cost of which is factored into the monthly rent they pay.

Further, another random sample of 150 girls was chosen out of the 5000 girls arriving Kota where the parents choose to stay with them so as to be a constant support. It's usually the mothers who are found to be staying with their daughters in accommodations where they could cook a healthy food for their daughters and that too in hygienic conditions. Figures collected out of responses from this

sample are pitted against the figures from the experimental group and the distinctions are analyzed.

**Table : 3.1**

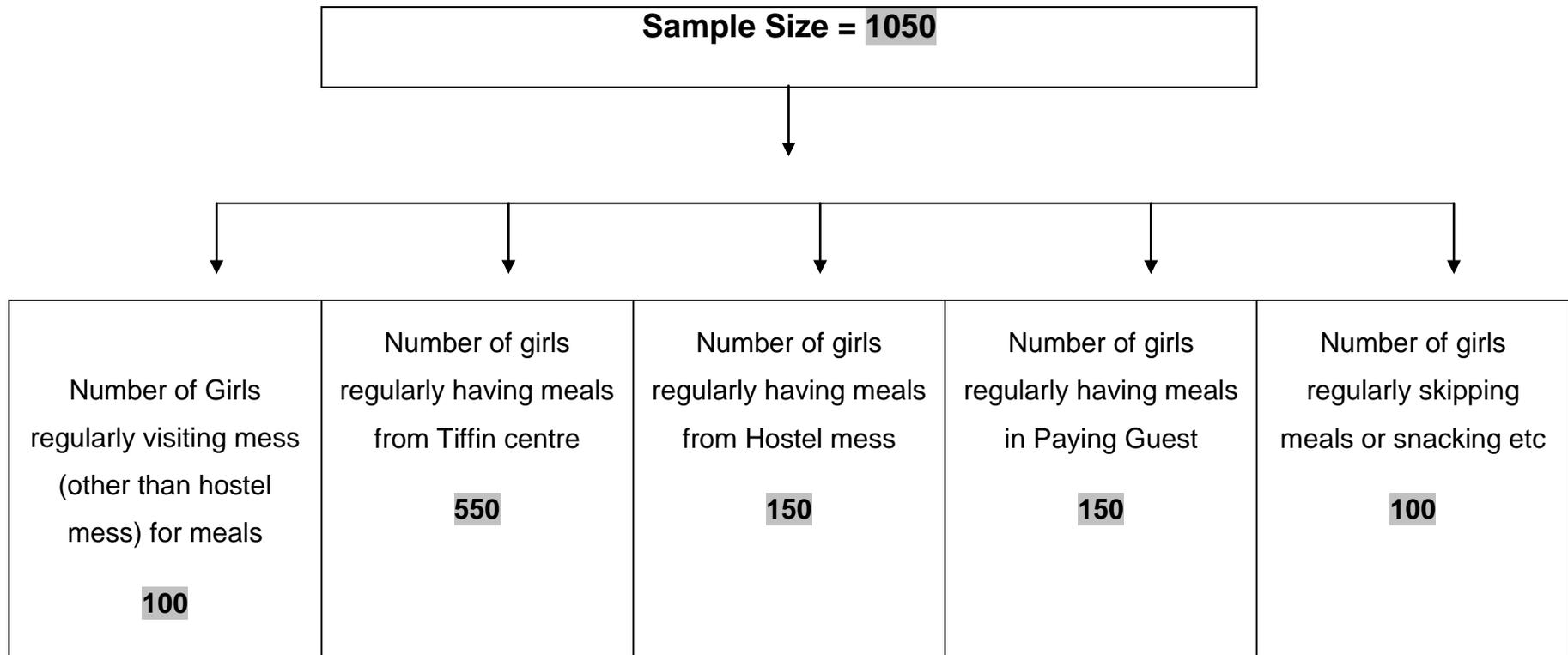
S.NO.	CATEGORY	TOTAL NUMBER OF GIRLS(approx.)	SAMPLE SIZE= 3% OF TOTAL GIRLS
1.	<b>Controlled group*</b>	5000	150
2.	<b>Experimental group</b>		
A	<b>Residential hostel</b>		
I	AC Hostel	10000	300
Ii	Non AC Hostel	20000	600
B	Paying Guest	5000	150
	Total	35000	1050

\*Girls who are residing with their parents either they are residents of Kota or outside Kota.

A sample group of 1050 that is 3% of the given 35000 girls living alone without parental supervision was chosen for the study and responses of this group are put against the responses of the 150 girls chosen out of the 5000 girls living under the guidance of parents. This eventually means a total of 1200 girls were asked for their responses to various questions.

1. The girls have an erratic pattern of eating, sometimes they may eat at their regular mess and sometimes they may skip their mess and eat at a different mess. This is of course a result of the desire to keep tasting variety which may not be available at their own mess.
2. A majority of girls prefer eating at Tiffin centers as it provides them meals at their door steps.
3. There is a small number of girls who are also in the habit of skipping their meals and then compensate for it by having snacks.

The above given facts can be amply demonstrated with the help of the below given flow chart:



**Fig. : 3.1 Distribution of girls in the Experimental group as per their eating choices**

## PRIMARY DATA

### 3.4 TOOLS USED

The collection of data wasn't an easy task; it required detailed questionnaires seeking answers from subjects regarding their food preferences, their schedules of eating, and the meals they skip, the unhealthy eating habits they possess and the healthy food they get to eat. Finding the questionnaire of our specific need and choice proved to be a tough task. Despite a lot of searches, we couldn't find a relevant questionnaire that represented the exact profile that we desired. Thus we planned a questionnaire that suited the special needs of our study, sent it to three experts and got it standardized.

Further, to check the fact that the questionnaire planned by us was standardized or not, we conducted a quick pilot study which gave us enough reason to consider our questionnaire up to the mark and standard enough to collect information that we sought. Moreover, the 24-hour recall method that we had to employ for the collection of data relevant to the study was an easy task as we found this questionnaire readily available and applied it to our best use. The questionnaire also focused on the kind of food they consumed round the clock, which means an ideal day what they consumed with the passage of time and how much. Primary data was sourced through a casual chat with respondents who were invariably either the neighbours or the petty businessmen vending articles of day-to-day domestic use.

The questionnaires employed by us to get all this information in detail were as follows:

1. Nutrition questionnaire regarding food habit and eating behavior. (Annexure A)
2. Body-image, disordered eating, and weight management. (Annexure B)
3. 24-hour dietary intake questionnaire. (Annexure C)
4. Quality of Nutrition after educational intervention. (Annexure D)

### **3.5 PROCEDURE USED FOR DATA COLLECTION**

1. Data collection was the most challenging job we had to undertake. It wasn't easy as we had to rush about hundreds of different hostels for the purpose of interviewing the girls. These hostels were kilometers apart from each other and accessibility to all of them wasn't permitted. As they were girls' hostels, special permission had to be taken and there were cases where the permission wasn't even granted. At some places we were outrightly asked to leave as they didn't trust our credentials despite being given so many proofs.
2. Secondly, questionnaires had to be handed over to the girls which again was a tough job as it entailed requesting the girls to fill it with the right information, even though we knew getting the honest information from the girls would be pretty difficult.
3. The questionnaire consisted of questions seeking answers regarding food choices, their schedules while eating and the carelessness regarding hygiene and health. Further, one more type of questionnaire sought the 24-hour recall, which meant the girls were asked to recall what they ate on a given day right from the time they got up till the time they went to sleep.

### **3.6 FOOD INTAKE AND ANTHROPOMETRIC PARAMETERS**

The study proved to be a bit complex as the figures collected had to be thoroughly searched with the right perspectives keeping in mind the individuality of each girl and scope of error that could creep in as a result of oversight. Food consumption of the subjects was recorded for seven successive days through a 24 hour recall method. Their routine meals including their breakfast, lunch and supper, also how often they love to skip their meals and how they compensate for that. What actually rules their eating pattern, is it the taste, nutrition or consuming just for the sake of satiating hunger? What really is of utmost importance is an analytical observation of their height, weight, mid upper arm circumference(MUAC) and triceps skin fold thickness(TSFT) as these parameters are crucial to the calculation of their body mass index(BMI). These parameters gave us a virtual insight into the

kind of meals these girls are being offered, the dietary pattern they have evolved over a stretch of time and their preferences and compulsions that lead them to live a life that might not be as fulfilling as it so seems.

### **3.7 NUTRITIONAL COUNSELING**

Since it's an interventional program, it aims at counseling the girls so that they could be made aware of the kind of nutrition that they require to keep in good shape away from parents. Being alone and keeping fit is a challenge they need to face on a regular basis and it's only possible when they introspect a bit and then with a little guidance shape up their lives as they wish to. Girls in the experimental group were contacted with repeated visits, though it turned out to be a difficult task, requested to be a part of the study and then with their consent their responses were recorded. The common means used to influence their eating habits were:

1. Posters (Included the ones giving tips to adolescents regarding best possible options in terms of meals)
2. Charts (included the ones that tried to make the girls aware about healthy eating patterns)
3. Leaflets ( to educate the cooks about hygiene)
4. Pamphlets (to enrich the knowledge of girls regarding what to avoid and what to accept while selecting meals)
5. Three workshops organized at different days to educate them about the right meals, the ways to maintain hygiene, and the right schedule that keep them in shape.
6. Video clips (clips of cooks educating the chefs regarding what to involve in healthy diets) <https://www.youtube.com/watch?v=pdfnBVIuFAQU>

The above given You-tube link is a beautiful 10 min clip on how youngsters should plan their diet to keep themselves fit. It's a link that shows a professional cook educating people on dividing their meals into small healthy categories, each consisting of nutrients vital to the healthy

well being of youngsters. The clip has presented the significance of carbohydrates, proteins, vitamins and minerals and their balanced proportions in respective meals which could be considered ideal for the physical as well as intellectual growth of adolescents.

7. Power point presentations (A 20 minutes presentation to enlighten the girls about healthy meal choices, schedules and regimes to be followed to stay fit). The PPTs were targeted to make the adolescents aware about healthy eating choices, nutrients to be included in routine meals, avoiding unhealthy choices, significance of physical exercises and the drawbacks of a sedentary lifestyle. A collage consisting of all the PPTs that were shown to the girls is given underneath to give a fair idea about how the workshops were conducted.
8. Even mess owners and cooks at paying guest accommodations were counseled with informational posters on what to offer these young girls so as to keep them in good health.

# HEALTHY EATING PATTERNS



Fig. : 3.2 Chart on Healthy eating patterns

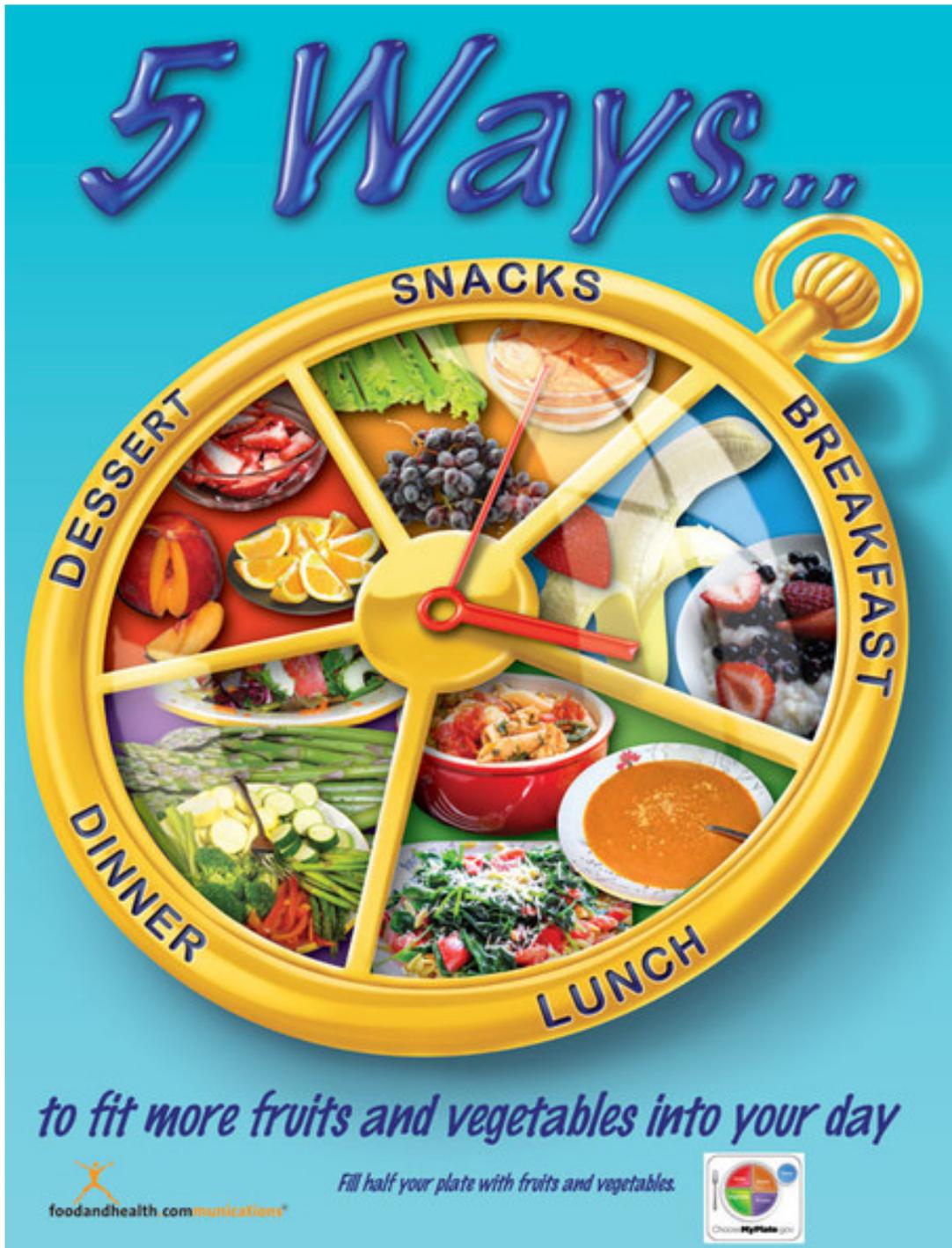


Fig. : 3.3 Poster on the best options available in meals



Fig. : 3.4 Chart on how to balance meals with calorific requirements



**Fig. : 3.5** Poster educating adolescents on reducing LDL

## **MAINTAIN HYGIENE**

### **STAY HEALTHY**

- 1. Take care to wash vegetables before chopping them**
- 2. It is advisable to cook with gloves on**
- 3. Vegetables like cauliflower, cabbages should be washed even after being chopped as they may contain insects inside**
- 4. Flour used shouldn't be substandard**
- 5. Oil shouldn't be reused as it may hydrogenate it.**
- 6. Kitchen should be cleaned in a routine**
- 7. The dustbins kept in dining halls should have lids to avoid flies.**

**Fig. 3.6 Leaflet handed over to the cooks and adolescents during the seminar**



### Big picture strategies To help you

1. Enough calories
2. Variety of foods
3. Moderate portions
4. Fruits, vegetables, grains, and legumes
5. Water
6. Limit sugary foods, salt, and refined-grain products
7. Don't be the food police
8. Get moving



### OUTLINE

2. What is a healthy diet?
2. How do we stay healthy?
3. What are the healthy food?
4. What are the strategies for a healthy eating? What is healthy diet pyramid?
5. How do we eat smartly?
6. How does healthy living contribute our lifes?

### What's healthy eating?

- Improve health
- Increase happiness
- Prevention of many chronic health risks.



### What's healthy eating about?

feeling great

having more energy

being fit

It is all about; *Healthy Living*

### 1. EAT ENOUGH CALORIES

- Balance calorie intake and calorie expenditure.
- Don't eat more food



The average daily allowance: 2,000 calories.

### 2. EAT A VARIETY OF PRODUCTS



- Eat food you do not normally eat
- Fruits, vegetables, grains and legumes...

### 3. KEEP PORTIONS MODERATE



- Choose a starter instead of an entrée.
- Don't order supersized anything.

### 4. EAT PLENTY OF FRUITS, VEGETABLES, GRAINS, and LEGUMES



- Foods high in complex carbohydrates, fiber, vitamins, and minerals, low in fat, and free of cholesterol.
- Try to get fresh, local produce.

### 5. DRINK MORE WATER



- Flushes our systems; the kidneys and bladder, of waste products and toxins.
- A majority of Americans go through life dehydrated.

### 6. LIMIT SUGARY FOODS, SALT, and REFINED-GRAINS PRODUCTS

- Sugar is added to a vast array of foods.



- In a year, just one daily 12-ounce can of soda (160 calories) can increase your weight by 16 pounds.

### 8. GET MOVING

- Energy and feelings of well-being.



Exercising 30 minutes a day, either in a row or broken up, is beneficial to your health

#ADAM

- Any healthy eating plan work even better.



What are the healthiest foods we can eat? What should we actually prefer to eat?

Fig 3.7 A collage consisting of PPTs presented during the workshops

## **Secondary data**

Secondary data analysis involves the use of data that is collected by someone else for some other purpose and it is used in the study to gain initial insight into the research problem. For this particular research study researcher has collected secondary data from a number of sources like,

1. published matter from news papers
2. Related Books
3. Dissertations, theses and project reports
4. Journals, magazines and periodicals
5. Online book stores
6. Online information from the websites of concerned organizations.
7. Scholarly written articles through websites.

## **3.9 STATISTICAL ANALYSIS OF DATA GATHERED**

It all started with the collection of data from the experimental group. Questions of all sorts ranging from the kind of meals these girls prefer, how many times a day they eat on average to how punctual or how erratic they are with their meals were put forth as a whole questionnaire to be answered by the chosen sample. Though some answers were vague enough to be called logical but then that's how researches work. It's called as the 'wisdom of the crowd'. The best way to describe it is to think of the importance of the law of averages as it is believed through statistical evidences that calculating averages out of given figures throws up the best results. Thus the experimental group comes up with all sorts of answers on varied questions which are duly listed down. The same questions are then put before the girls of the controlled group again expecting the answers to be close to reality. The two lists with their respective scores are now to be analysed comparatively. Data can't just be compared superficially as answers are vastly different with stark distinctions in their nature. Thus it deems fit that certain statistical tools are used to refine the data to such an extent that it represents the

closest possible outcome. Tools like calculating the means, variance, standard deviation seem to be the best ways available for reaching a conclusion; further the means of the scores were subjected to the t-test to test the significance of the differences. Though these tools in themselves are not truly indicative of what we anticipated but to a large extent their results could be relied upon and these results validate the hypothesis to a great degree. It would be best if all these statistical tools are briefly described so that their relevance and effectiveness could be well understood before they are applied to the given scores.

- 1) **Percentage (%)**:- Value out of one hundred
- 2) **Mean**:- Mean has been the best statistical tool ever to land upon the value that appears to represent the group as a whole. Statistically speaking, it's the average of the given scores, which means dividing the total of the scores with the frequency or the number of the scores taken into consideration.

Mean deviation: the distance of a score from the mean is called as the deviation from the mean ( $x$ ).

It can be represented with the formula  $x = X - \bar{X}$

The scores of the both experimental as well as the controlled group will be tabled methodically and their respective means will be calculated represented by the entity  $\bar{X}$ . For instance, about 10 students of class VIII took a maths test out of a total of 100 marks and their scores were listed in a sequence. These 10 students are from the experimental group which means students studying all by themselves without parental guidance.

Likewise, another 10 students belonging to the controlled group (students under consistent parental guidance and supervision) were given the same test and even their scores were duly jotted down in a list. The two lists appeared to look as below:

**Table : 3.2 Figures depicting mean deviation**

<b>EXPERIMENTAL</b>	<b>GROUP</b>	<b>CONTROLLED</b>	<b>GROUP</b>
X	$X-\bar{X}$	X	$X-\bar{X}$
77	+14.6	80	-0.7
48	-14.4	78	-2.7
59	-3.4	68	-12.7
72	+9.6	82	+1.3
63	+0.6	77	-3.7
55	-7.4	78	-2.7
70	+7.6	88	+7.3
60	-2.4	92	+11.3
54	-8.4	90	+9.3
66	+3.6	74	-6.7
$\Sigma X=624$	$\Sigma (X-\bar{X})=0$	$\Sigma X=807$	$\Sigma (X-\bar{X})=0$
N= 10	$\Sigma x=0$	N= 10	$\Sigma x=0$
$\bar{X}=62.4$		$\bar{X}= 80.7$	

Which means the sum total of score deviations from the mean is zero. So mean is such a value in a distribution of scores around which the sum total of score deviation is zero.

Thus mean in itself can't be utilized statistically successfully to reach a conclusion while comparing scores between experimental and controlled group.

## 2. Variance ( $\sigma^2$ ) :-

Since the sum total of deviation from the mean equals zero, mean can't be employed to read the typical characteristics of a distribution. But if all the deviation scores are squared and divided by N ( the number of cases ), it would give us the variance ( $\sigma^2$ ), the value of which can be utilized successfully, the only drawback being the scores become too large to represent the spread.

$$\begin{aligned}\sigma^2 &= \frac{\sum (X - \bar{X})^2}{N} \\ &= \frac{\sum x^2}{N}\end{aligned}$$

## 3. Standard Deviation ( $\sigma$ )

The Standard Deviation is actually square root of the variance (  $\sigma^2$  ). If we take the previous example into consideration once again, it would give us a fair idea about the importance of standard deviation and the edge it carries over Variance and the simple usage of Mean. Variance goes a bit too unrealistic as the result is far too large to realistically signify the spread of scores whereas Standard Deviation is far more realistic as the outcome is well within the scope of the spread.

**Table : 3.3 Figures depicting calculated standard deviations**

<b>EXPERIMENTAL</b>	<b>GROUP</b>	<b>CONTROLLED</b>	<b>GROUP</b>
$X-\bar{X}$	$x^2$	$X-\bar{X}$	$x^2$
+14.6	213.16	-0.7	0.49
-14.4	207.36	-2.7	7.29
-3.4	11.56	-12.7	161.29
+9.6	92.16	+ 1.3	1.69
+0.6	0.36	-3.7	13.69
+3.6	54.76	-2.7	7.29
+7.6	57.76	+7.3	53.29
-2.4	5.76	+11.3	127.69
-8.4	70.56	+9.3	86.49
+3.6	12.96	-6.7	44.89
	$\Sigma x^2 = 726.4$		$\Sigma x^2 = 504.1$

$$\begin{aligned} \text{Variance} &= \frac{\sum x^2}{N} = \frac{726.4}{10} \\ &= 72.64 \end{aligned}$$

$$\begin{aligned} \text{Variance} &= \frac{\sum x^2}{N} = \frac{504.1}{10} \\ &= 50.41 \end{aligned}$$

$$\begin{aligned} \text{Standard Deviation } (\sigma) &= \sqrt{\frac{\sum x^2}{N}} \\ &= \sqrt{\frac{726.4}{10}} \\ &= 8.52 \end{aligned}$$

$$\begin{aligned} \text{Standard Deviation } (\sigma) &= \sqrt{\frac{\sum x^2}{N}} \\ &= \sqrt{\frac{504.1}{10}} \\ &= 7.10 \end{aligned}$$

As it's clearly visible through the scores that the standard deviation for an experimental group is much higher as compared to standard deviation for the controlled group which may signify the fact that controlled group scores are much closer to the mean when pitted against the experimental group where the students tend to study less and have more fun.

This deviation method for computing variance and standard deviation seems fit for small number of scores but if the number of scores is large, this method could be a little awkward.

#### 4. t Test

Computing the differences between the respective means and deviations of the Experimental group and the controlled group may give us a vague idea about the conclusions being sought but it may not be a conclusive proof about the effectiveness of the controlled group in the previous illustration. The fact being that the sample chosen is pretty small and might not be a fair representative of the whole, which somehow indicates it might have happened as a result of sampling error.

### 3.10 NULL HYPOTHESIS

This in a way indicates that the hypothesis might have been just a blurred assumption of what finally turned out to be non-existent. It can thus be construed as a null hypothesis which in the above illustration means that not much of a difference occurs amongst the results of controlled group students and the difference visible between the means and deviations is just an outcome of sampling error and the hypothesis as a result was simply a figment of imagination. Another reason attributed to a null hypothesis is that, if the difference perceived between the means of two samples is too small, it is again considered to be a chance or a result of sampling error. This case necessitates the use of a statistical tool which could prove the difference between the two means to be significant enough to validate the hypothesis. This indirectly means for large samples a mere difference between the two means and deviations is not at all a test of significance of the difference, we rather need a t-Test to come to a conclusion. A t-Test is a test of significance of difference between the two means and can be presented as:

$$t = \frac{\bar{X}_2 - \bar{X}_1}{\sqrt{\frac{S_2^2}{N_2} + \frac{S_1^2}{N_1}}}$$

Where  $\bar{X}_2$  = Mean of Controlled group

$\bar{X}_1$  = Mean of Experimental group

$N_2$  = number of cases in Controlled group

$N_1$  = number of cases in Experimental group

$S_2^2$  = Variance of Controlled sample

$S_1^2$  = Variance of Experimental sample

$$t = \frac{80.7 - 62.4}{\sqrt{\frac{50.41}{10} + \frac{72.64}{10}}}$$
$$t = \frac{18.3}{3.50}$$

Calculating this ratio will give us a valuable insight. If the numerator in this ratio is much higher than the denominator, a null hypothesis may immediately be rejected. It will be understood that the difference that has occurred in the means is not a result of sampling error rather something really happened in the Experimental group to make it different from the Controlled group. And of course, if the numerator is not much greater in value than the denominator, it will be believed that it was just a sampling error that prompted the difference and hence the hypothesis could be concluded to be a null hypothesis.

## Chapter - IV

# ANALYSIS AND INFERENCES

## **ANALYSIS AND INFERENCES**

This chapter is all about assessing of hypothesis and analysis of objectives to study nutritional status and dietary pattern of girls residing in hostels for coaching at educational city, Kota.

The girls in the Experimental group and the Controlled group were subjected to lengthy questionnaires which contained questions aimed at extracting details about their dietary habits, food hygiene, 24 hour recall and specific interests regarding food. The data was collected separately for Experimental as well as Controlled group with a sample of 1050 girls in the Experimental group and 150 in the Controlled group. The questionnaire was exhaustive in nature as it targeted in depth information about not just the kind of food but also specific calorific contents of various edibles being consumed by the young girls. The answers they came up with have been listed methodically into tables to be used later for a detailed analysis. The analysis in itself won't be an easy task as it would entail comparing the data with statistical tools as a simple comparison won't suffice. Certain tables with comparative data are presented below:

Based on the data garnered, the analysis has been broken down into two sections.

### **Section I**

It glosses over the analysis of objectives

### **Section II**

The scope of Section II encompasses the analysis and interpretation of the Hypothesis formulated.

### **A. Basic Information**

As the data posted above quite effectively summarizes the age groups that most of the girls living in the hostels of Kota belong to. The girls lie between 16 to 20 years in age. This is that age group that undergoes maximum physiological changes and thus deserves all our attention.

### **NUMBER OF SIBLINGS**

The questionnaire started off with the most basic of all the questions like the number of sibling's girls had. This question carried some significance as it was helpful in figuring out the quality of life financially as well as nutritionally these girls were living. It remotely indicates the fact that girls with lots of siblings are usually ignored when it comes to healthy nutrition. Though it doesn't stand true today, it still bears importance in making some guesses that might be of some use while reading the data.

**Table : 4.1 Figures depicting number of siblings**

<b>Category</b>	<b>Just one sibling (%)</b>	<b>Two siblings(%)</b>
Experimental group	63	37
Controlled group	58	42

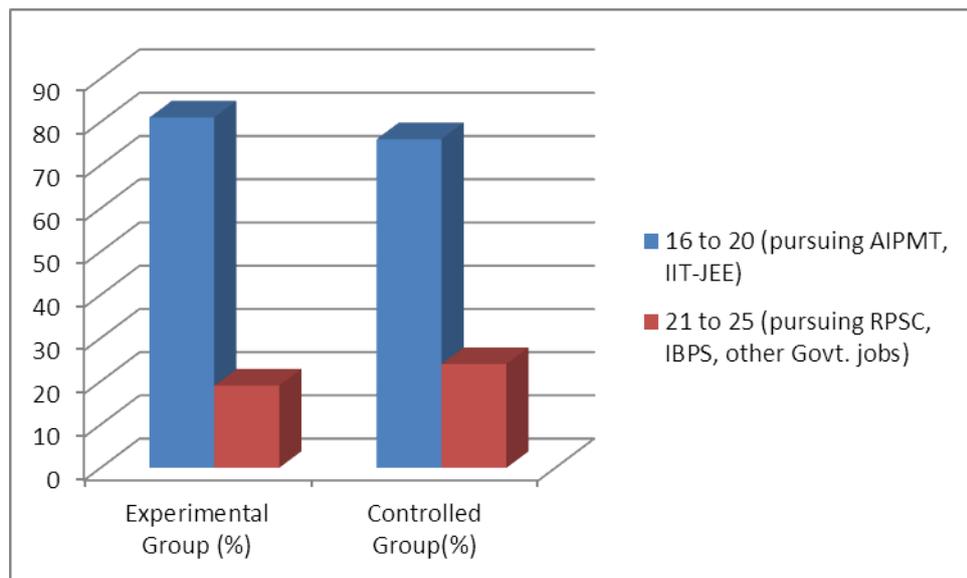
As the data quoted above indicates that both in the Controlled as well as the Experimental group, the figures related to number of siblings are almost the same. A small percentage of girls have 2 to 3 siblings but a majority of them have just one sibling which is enough evidence to the fact that most of the girls are administered healthy diet right from childhood.

## **COURSES THAT MOST OF THE GIRLS ARE PURSUING**

Since the study focused on adolescent girls living in the hostels of Kota a lot of emphasis has been laid upon the girls residing in the hostels and preparing for competitive exams like medical and engineering entrances for prestigious colleges across the country. Thus majority of the subject girls were in the age group 16 to 20 pursuing classes XI-XII and preparing for competitive exams like IIT-JEE and AIPMT and a smaller chunk of girls lay in the age group 21 to 25 who were already graduates and were preparing for competitions like RPSC and IBPS for Banks and other Govt. jobs. The table given below clearly reflects the figures accumulated through the questionnaires.

**Table : 4.2 Depicting number of girls pursuing various courses**

Age Group	Experimental Group (%)	Controlled Group(%)
16 to 20 (pursuing AIPMT, IIT-JEE)	81	76
21 to 25 (pursuing RPSC, IBPS, other Govt. jobs)	19	24



**Fig. : 4.1 Figures plotted on a graph denoting girls in two different age groups**

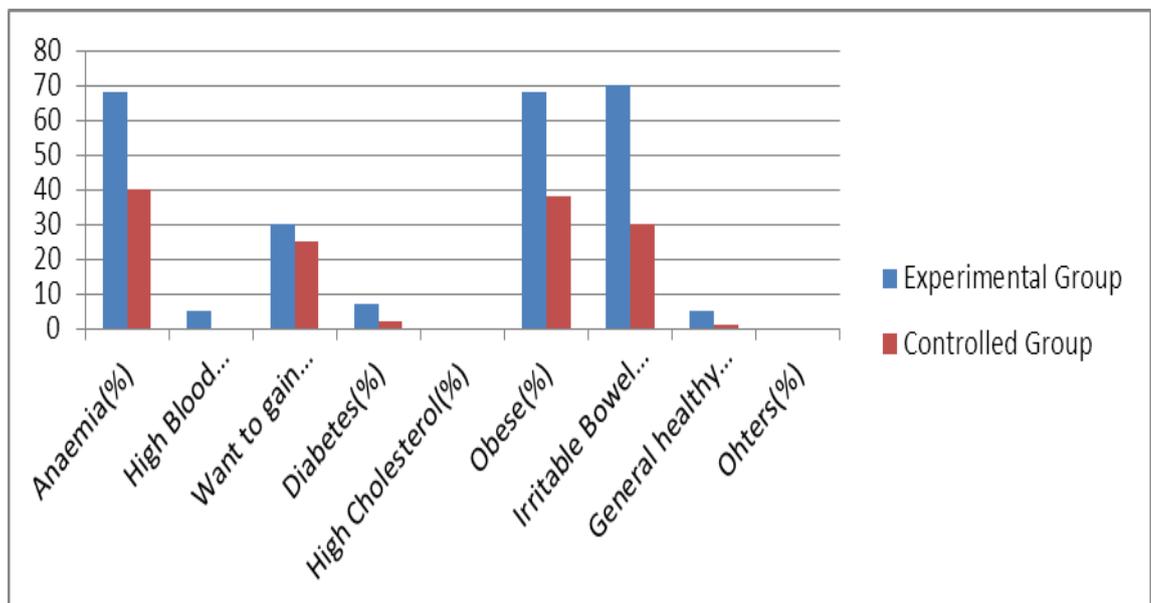
As the data posted above quite effectively summarizes the age groups that most of the girls living in the hostels of Kota belong to. Majority of them in both the groups lie between 16 to 20 in age and thus the entire study is a bit lop sided towards girls in this majority age group. This is that age group that undergoes maximum physiological changes and thus deserves all our attention.

### **Why do the girls want to see a nutritionist?**

The girls were even asked questions regarding their consultations and the need to consult with doctors and nutritionists. Since girls in the Experimental Group are staying away from their parents, there is always an ever growing need to consult doctors for common ailments that these girls suffer. These girls are often more likely to fall a prey to fevers and infections as they are more exposed to harsh environments as compared to girls in the Controlled Group who live more cocooned and guided with their parents. The questions threw up a helpful data which was put into a table to be used for future analysis.

**Table : 4.3 figures depicting number of girls requiring medication for various ailments**

Diseases	Anaemia	High Blood Pressure	Want to gain weight	Diabetes	High Cholesterol	Obese	Irritable Bowel Syndrome	General health eating advice	Others
Experimental Group	68.28	5.04	30	7.04	00	68	70	5.04	00
Controlled Group	40	00	25	02	00	38	30	01	00



**Fig. : 4.2 Graph denoting number of girls requiring treatment for varied ailments**

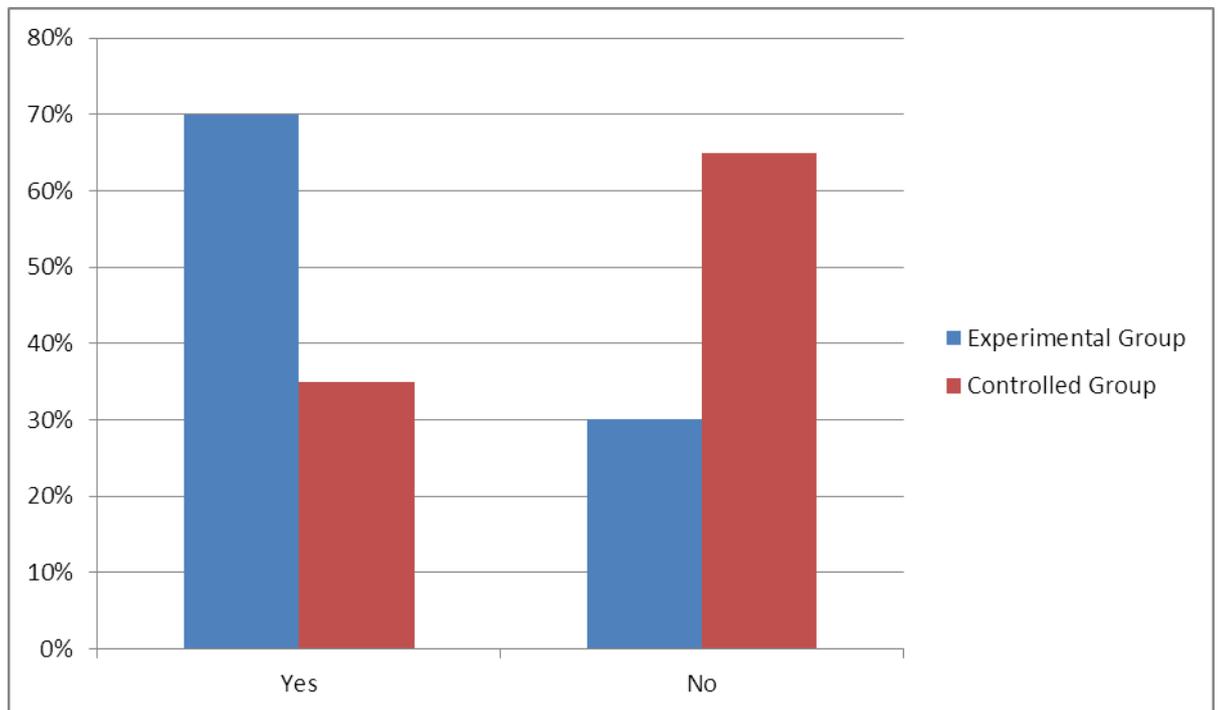
As the data plotted on the bar diagram clearly reflects, girls in the Experimental Group are more vulnerable to common ailments like Anaemia and irritable Bowel Syndrome as eating out exposes them to these disorders quite intensely as compared to girls in the Controlled group. They don't get the right set of minerals like iron and folic acid which makes them anaemic and eating out forces them to consume unhygienic food with adulterated oils and spices which again makes them highly susceptible to disorderly bowels and hence quite weak. Even instances of life style diseases like Diabetes and disorders like obesity afflict girls in the Experimental Group more as a consequence of imbalanced eating habits and thereby making it necessary to consult nutritionists more often.

**Are you being treated for a medical condition?**

When the girls were asked this question, their responses gave adequate evidence to the fact that girls in the Experimental Group are more prone to ailments as compared to girls in the Controlled Group as staying under the supervision of parents has its own advantage

**Table : 4.4 Figures depicting distribution of girls being treated for ailments**

Category	Yes	No	Not sure
Experimental Group	70%	30%	
Controlled Group	35%	65%	



**Fig. : 4.3 Graph denoting number of girls visited `doctor**

As the above given figures clearly reveal that majority of girls in the Experimental Group are quite susceptible to some physical disorder or other and as such they are commonly found visiting medical practitioners seeking quick fix treatments for common ailments. Quite the contrary, girls in the Controlled group get to visit doctors less as they are less likely to fall prey to ailments as their diets and hygiene are well taken care of under the watchful eyes of parents.

## **A. FOOD HABITS AND EATING BEHAVIOUR**

### **Eating pattern followed by the girls**

A common question that almost all the girls in both the groups were asked was whether they keep a track of calories they intake on a routine. The responses were negative to a large extent which means girls in this age group hardly keep a track of what they eat and when they eat which makes them very much prone to disorders of varied kinds. Their eating habits could be called erratic to a large extent as they skip meals as per their whims, overeat when they tend to like a delicacy and follow trends while consuming meals. Like they may start eating something if they are told to do so as it would make them look good. Even vice versa stands true which means they may go on a crash diet as they feel it might make them look fitter and lean.

### **The snacks and meals they either skip or eat**

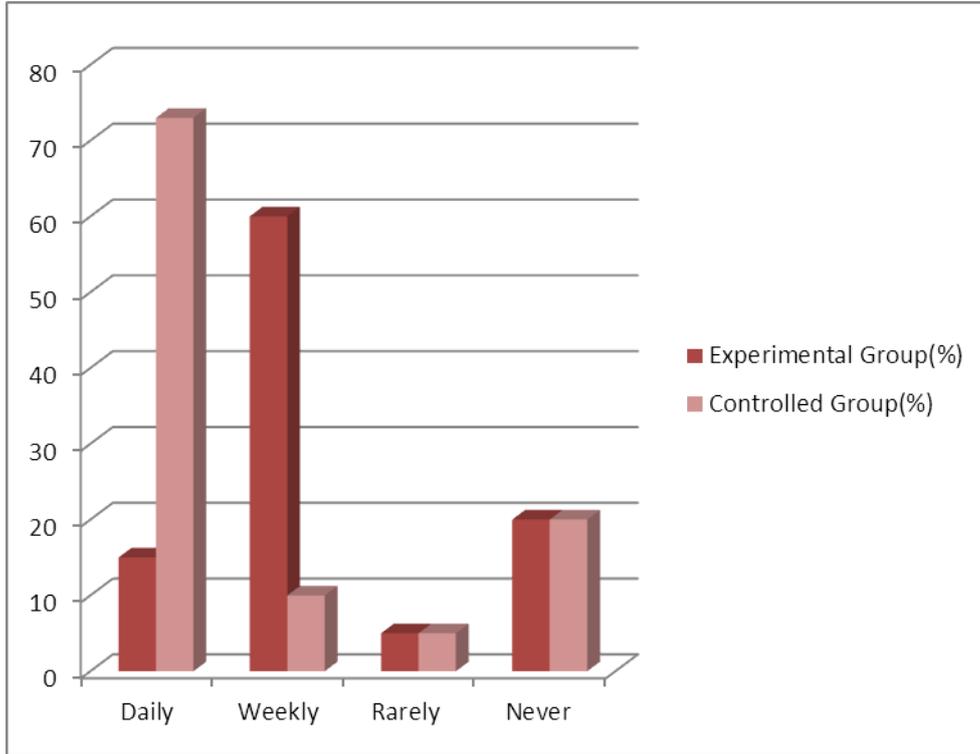
The data collection threw up certain interesting and amazing facts regarding routine consumption of girls. Their consumption of Breakfast, lunch and dinner is highly erratic, especially when it comes to girls in the Experimental Group as compared to girls in the Controlled Group. They might skip their Breakfasts, lunch and dinner in rapid succession. The data was collected separately for meals at different times of the day and the figures were tabled for analysis.

**Table : 4.5 Figures depicting girls consuming and missing breakfasts**

**Girls taking Breakfast**

Category	Daily	Weekly	Rarely	Never
Experimental Group(%)	15	60	05	20
Controlled Group(%)	73	10	05	20

As it's clearly reflected in the above given table, a majority of girls in the Experimental Group are quite indifferent towards their Breakfast. They often prefer missing their breakfast as it seems pretty uncomfortable eating something early morning specially when they have to attend morning classes. It's not that they don't feel hungry; it's simply quite tedious for them to get up early and adjust the breakfast in their schedule. On the other hand, girls in the Controlled Group have to be quite particular about their breakfast under parental guidance even if they don't wish to. It was found that most of these girls are rigidly compelled by the parents for a healthy breakfast with a glass of milk as well. A Bar chart quite aptly sums up the difference that exists between the breakfast consumption habits of girls in the two groups.



**Fig. : 4.4 Breakfast consumption pattern of girls**

### **Girls taking lunch**

Lunch seems to be the only meal that’s almost regular for both Experimental as well as Controlled Group. Since noon is that time of the day when girls (irrespective of the group they belong to) feel acute pangs of hunger which are irresistible and as such going for a lunch becomes unavoidable. Naturally sources of lunch are different for girls in the two groups which somehow means girls in the Experimental group get to eat food that could be considered a bit healthier as compared to the home cooked and hygienic food that the girls in the Controlled group get to eat more often. The data collected for the two groups was listed in a table for a methodical analysis later.

**Table : 4.6 Figures denoting number of girls consuming lunch**

Category	Daily	Weekly	Rarely	Never
Experimental Group(%)	100	-	-	-
Controlled Group(%)	100	-	-	-

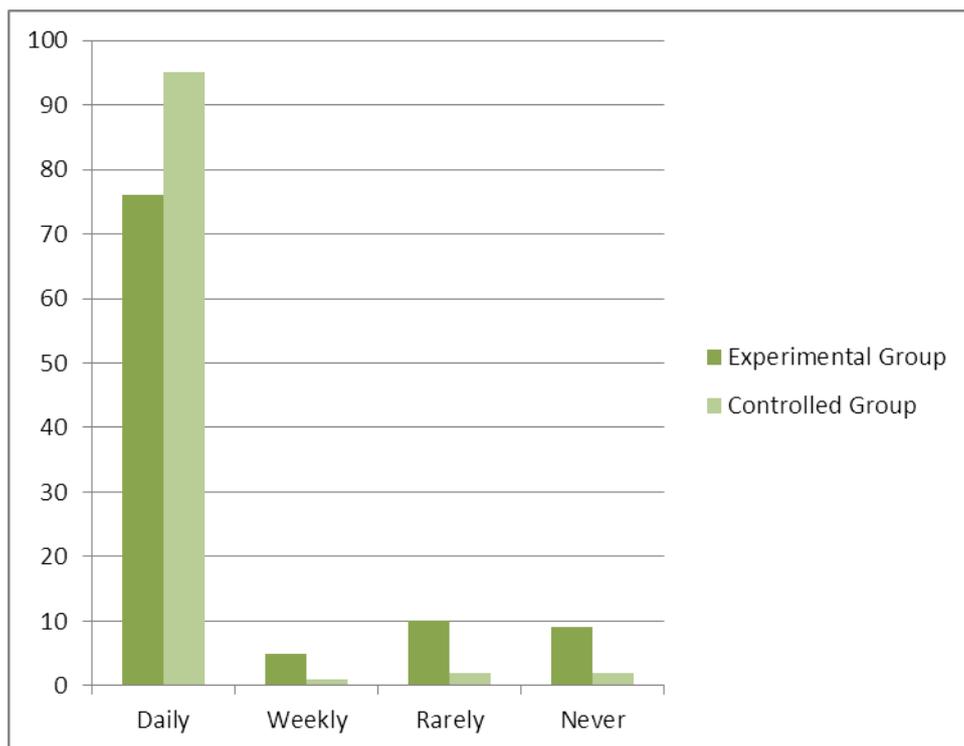
The data tabled above quite clearly indicates that not much of a difference exists between the two groups when it comes to consuming lunch as it's one such meal that nobody misses and even if it happens, it has to be done under duress and the numbers are such miniscule that they are not worth mentioning.

### **Girls taking supper**

Supper or the last meal of the day again gets a priority amongst girls of both the groups as they are in no hurry at that time of the day and can spend enough time to think and plan a comprehensive dinner. Again girls in the Controlled group are clear beneficiaries as they get to eat a healthy dinner with their parents as compared to girls in the Experimental Group who may miss it sometimes or may go for a substitute either in the form of fast foods or something totally unhygienic at roadside vendors. The data collected was placed comparatively in a table to be plotted in a pie later.

**Table : 4.7 Figures depicting supper consumption pattern of girls**

<b>Category</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Experimental Group	76	05	10	09
Controlled Group	95	01	02	02



**Fig. : 4.5 Graph denoting supper consumption pattern of girls**

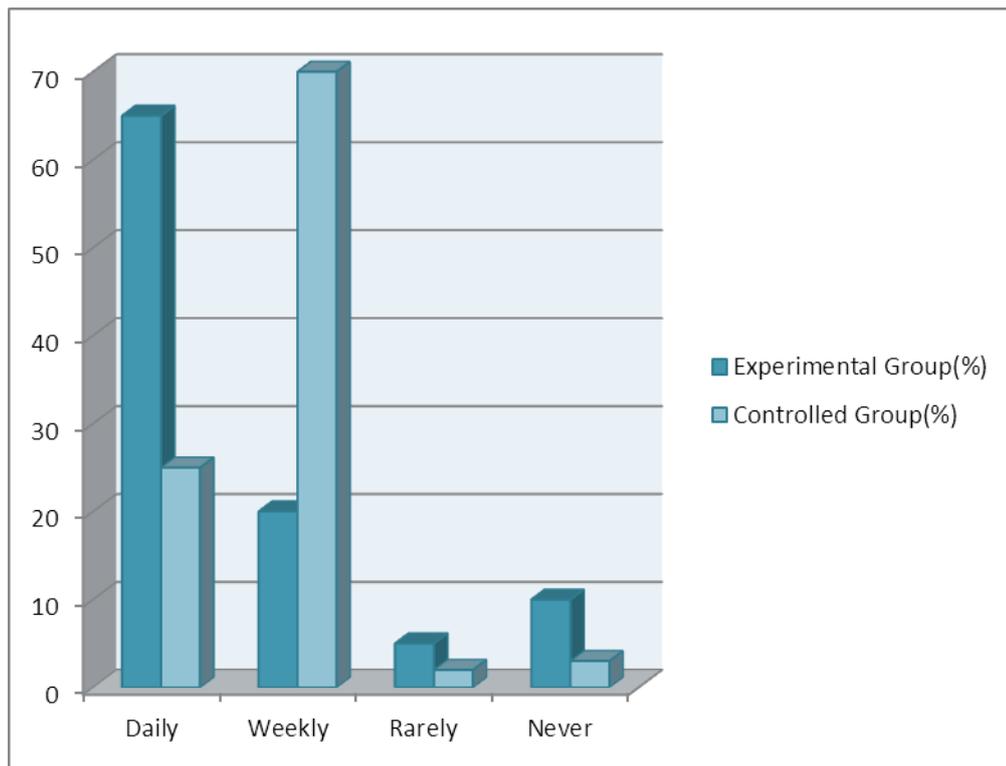
As the data is quite an evidence to the fact that girls in the Controlled Group are pretty much regular in their supper consuming habits as they are under a regular parental supervision and as such they are rarely allowed to miss their supper, while girls in the Experimental Group skip their supper occasionally as and when it suits them, sometimes it may happen as a consequence of not making it to the mess in time or the food cooked at the mess might not be to their liking or they may even miss it in favour of some junk food which they might have decided to take.

### **Girls consuming afternoon snacks**

Snacks occupy a position of prime importance in the life of these young girls. Since they are in a growing age, the rate of metabolism is very fast and for them feeling of hunger is a constant. Snacks are the best fillers and could be consumed almost anytime by these girls. Quite naturally, girls in the Experimental Group are more inclined towards oily wafers and French fries and they may go for it almost any time of the day. Afternoons are usually the time when they feel the hungriest and snacks seem to be the best way to kill that hunger. Girls in both the groups were questioned regarding their snack consumption and the figures were tabled for further analysis.

**Table : 4.8 Snacks consumption pattern of girls**

<b>Category</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Experimental Group(%)	65	20	05	10
Controlled Group(%)	25	70	02	03



**Fig. : 4.6 Graph denoting snack consumption pattern of girls**

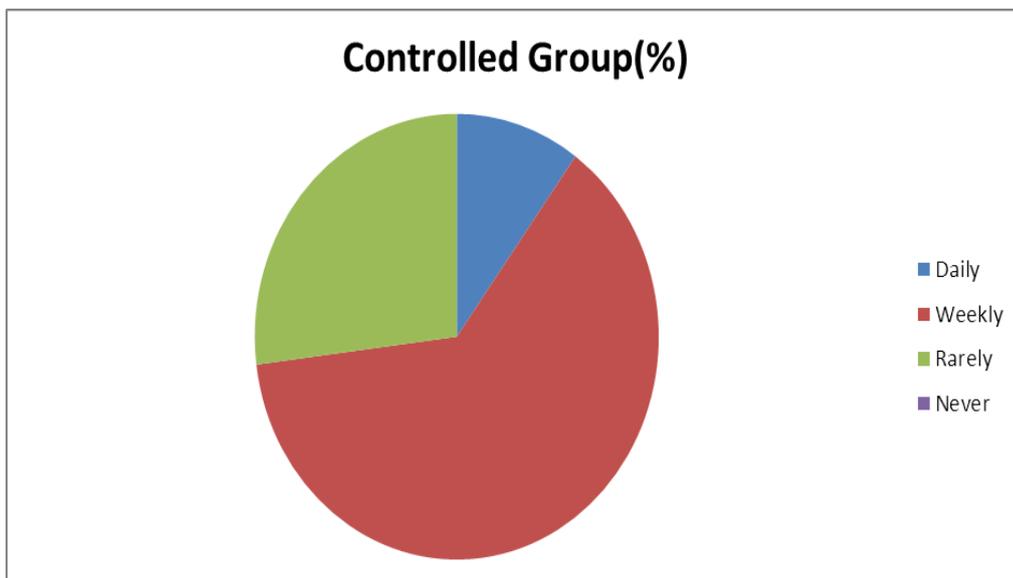
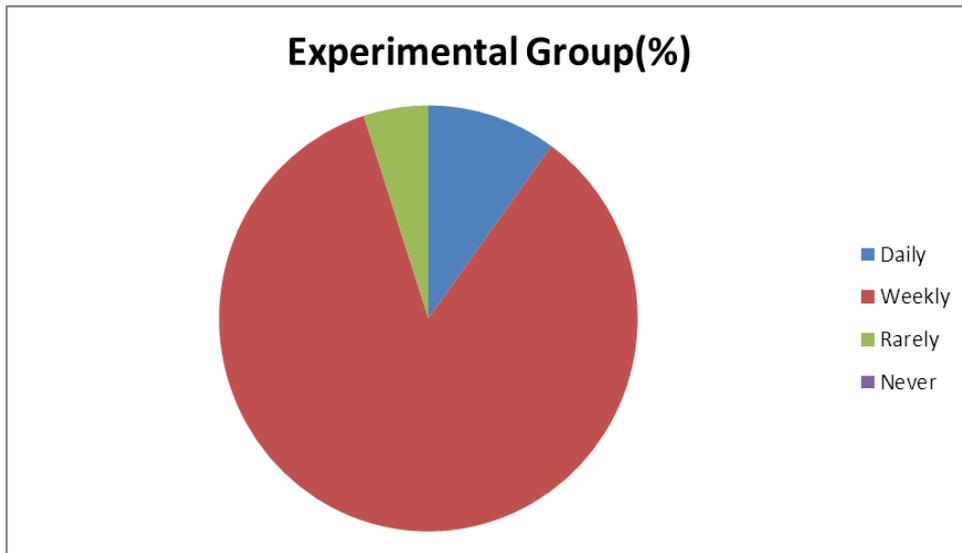
As the figures suggest girls in the Experimental Group tend to heavily go for snacks as there is nobody to warn them of the harmful consequences of unnecessary calories whereas girls in the Controlled Group are less likely to go for snacks as strict parental supervision doesn't let them do so. Snacks are universally known to be harmful and staying alone gives these girls an opportunity to munch upon these heavily salted lethal snacks almost uncontrolled.

### **GIRLS EATING AT FAST FOOD RESTAURANTS**

The questionnaire consisted of questions seeking responses from the girls regarding the frequency with which they eat at fast food restaurants. It is commonly noticed that girls in the Experimental group have a liberal approach towards fast food and as such their consumption of junk is unrestricted. They may even go to the length of consuming junk food in a regular succession. The data collected for the two groups has been plotted on a pie thereby clearly hinting the frequency with which the two groups consume this junk.

**Table : 4.9 Figures showing number of girls eating at fast food restaurants**

<b>Category</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Experimental Group(%)	10	85	05	0
Controlled Group(%)	10	63	27	0



**Fig. : 4.7 Pie distribution of number of girls in controlled as well as Experimental group eating at fast food restaurants**

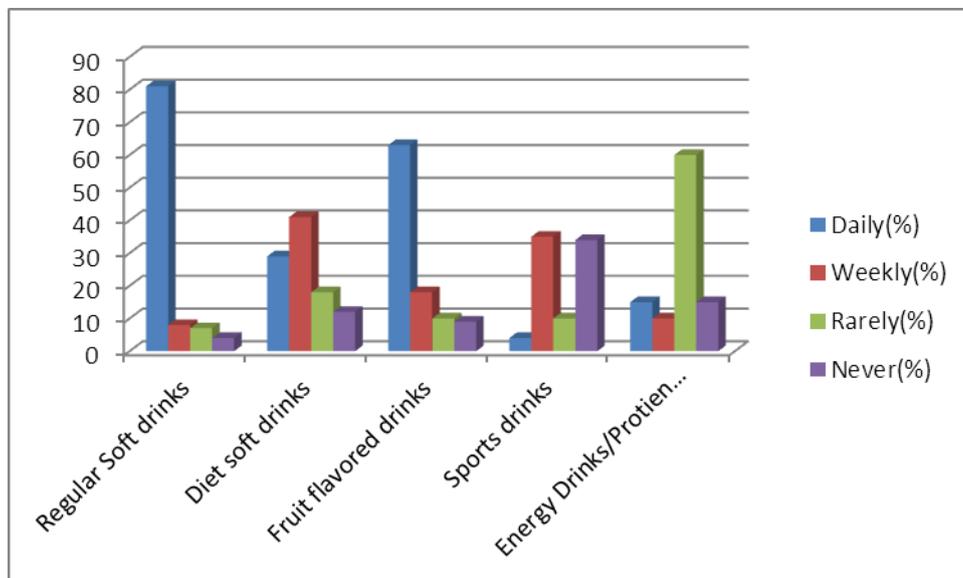
As the figures plotted on the pie show clearly that majority girls in the Experimental Group consume junk food, in fact the frequency with which they consume junk far exceeds the frequency with which the girls in the Controlled Group consume this food. The reason is well assumed, since the girls in the Controlled Group are living under the constant monitoring of parents, they get to eat home cooked food quite often which considerably reduces the possibility of consuming junk, quite the contrary the same can't be said for the girls in the Experimental Group as selecting what to eat depends solely on their respective whims.

### **Girls consuming unhealthy drinks**

Amongst the adolescents, it seems to be a norm to consume unhealthy drinks in a routine. They consume colas and other aerated drinks with an utmost regularity quite unmindful of their harmful consequences. These colas contain preservatives and compressed CO<sub>2</sub> which irritate the bowels to a large extent and may even lead to chronic acidity and a prolonged state of spasmodic indigestion. They even contain extra ounces of sugar which, if consistently consumed for a protracted period, may lead to diabetes of a severe order. Same is the case with fruit flavoured drinks which consist of preservatives and extra dollops of sugar which get the girls addicted to sweet drinks and may result in irreversible repercussions. The questionnaire aimed at asking the girls questions regarding the frequency with which they consume these unhealthy drinks and the responses were tabled to be plotted in a bar chart later.

**Table : 4.10 figures denoting number of girls in Experimental group consuming unhealthy drinks**

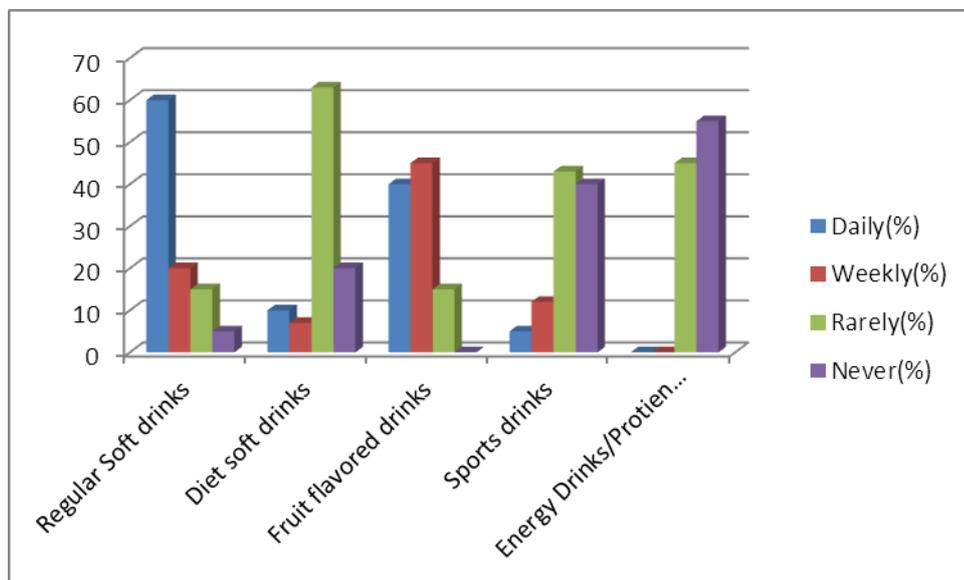
Category	Daily(%)	Weekly(%)	Rarely(%)	Never(%)
Regular Soft drinks	81	08	07	04
Diet soft drinks	29	41	18	12
Fruit flavored drinks	63	18	10	09
Sports drinks	04	35	10	34
Energy Drinks/Protien Supplements	15	10	60	15



**Fig. : 4.8 Graph depicting number of girls in Experimental group consuming unhealthy drinks**

**Table 4.11 Figures depicting number of girls in Controlled group consuming unhealthy drinks**

Category	Daily(%)	Weekly(%)	Rarely(%)	Never(%)
Regular Soft drinks	60	20	15	05
Diet soft drinks	10	07	63	20
Fruit flavored drinks	40	45	15	0
Sports drinks	05	12	43	40
Energy Drinks/Protien Supplements	0	0	45	55



**Fig. 4.9 Graph depicting number of girls in the Controlled group consuming unhealthy drinks**

**Table : 4.12 Statistical calculation of number of girls consuming unhealthy drinks**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group	507.5	258.009	3.568
Controlled Group	43.25	33.566	

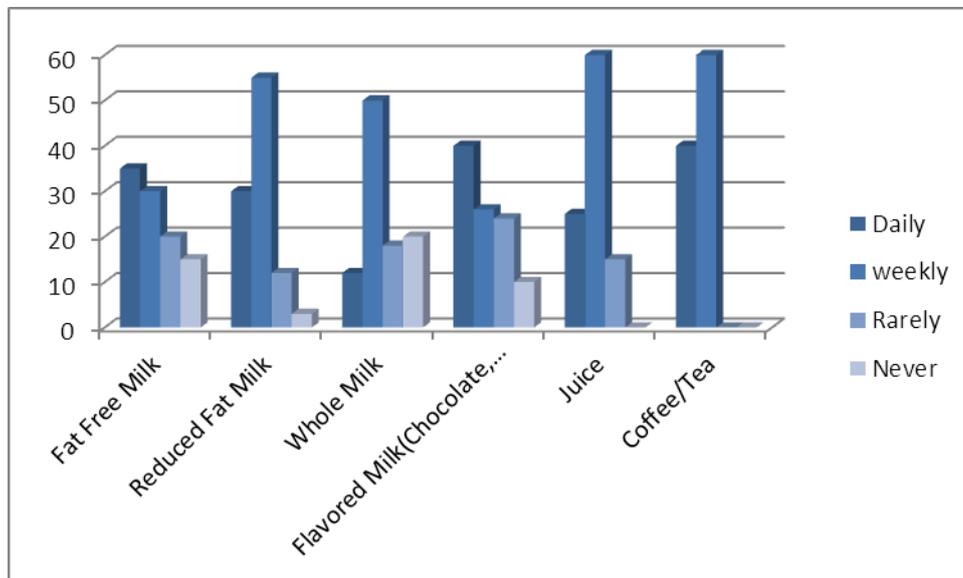
As the calculated t value of 3.568 exhibits clearly that there exists a great difference between the numerator and the denominator of the ratio which in itself implies that the difference between the two means hasn't occurred as a result of any sampling error and that the difference is a clear reflection of the fact that the girls in the experimental group get to consume these unhealthy drinks quite often as compared to the girls in the Controlled Group who are better monitored in their habits of consuming such drinks with harmful preservatives and sugar contents in excess.

### **Girls consuming Healthy Drinks**

Even certain healthy drinks are a norm amongst these youngsters. All milk based drinks can be considered healthy to a large extent as they contain certain vital vitamins deemed quite necessary for the growth of adolescents. Whether the milk is a fat free milk or whole milk, it retains its vitamin properties which boost immunity and milk is even universally known to be rich in nutrients and minerals. Girls were enquired regarding their consumption of milk products and the figures were tabled for a judicious analysis.

**Table : 4.13 Figures depicting number of girls in Experimental group consuming healthy drinks**

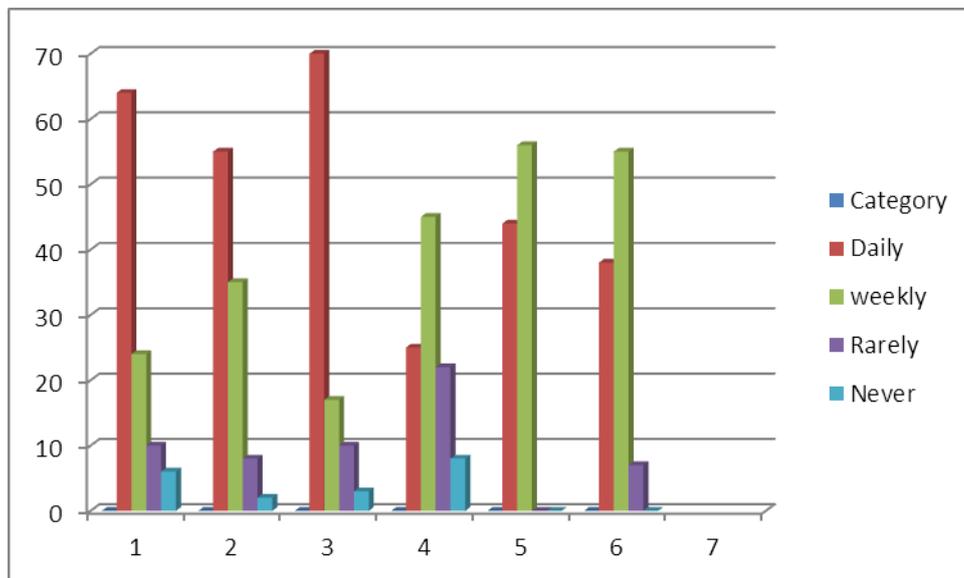
Category	Daily(%)	Weekly(%)	Rarely(%)	Never(%)
Fat Free Milk	35	30	20	15
Reduced Fat Milk	30	55	12	03
Whole Milk	12	50	18	20
Flavored Milk(Chocolate, Strawberry)	40	26	24	10
Juice	25	60	15	0
Coffee/Tea	40	60	0	0



**Fig. : 4.12 Healthy drinks consumption pattern of girls in Experimental group**

**Table 4.14 Figures depicting number of girls in Controlled group consuming healthy drinks**

Category	Daily(%)	weekly(%)	Rarely(%)	Never(%)
Fat Free Milk	60	24	10	06
Reduced Fat Milk	55	35	08	02
Whole Milk	70	17	10	03
Flavored Milk(Chocolate, Strawberry)	25	45	22	08
Juice	44	56	0	0
Coffee/Tea	38	55	07	0



**Fig. : 4.11 Healthy drinks consumption pattern of girls in Controlled group**

**Table : 4.15 Statistical calculation of number of girls consuming healthy drinks**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group	29.25	10.568	2.345
Controlled Group	52.5	16.77	

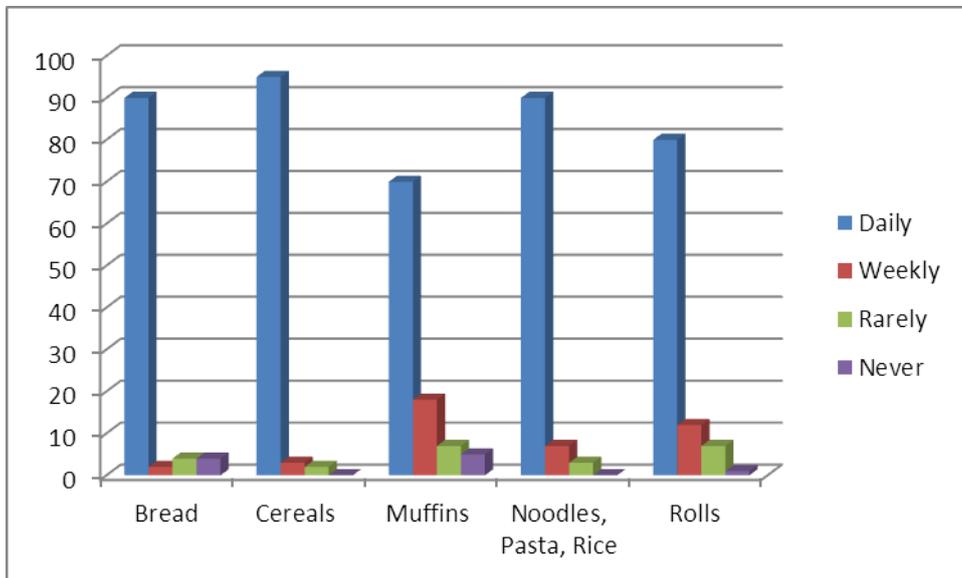
As is absolutely clear from a t value of 2.345, the difference between the numerator and the denominator of the ratio is big enough to reach a conclusion that there exists a large distinction between the means of the two groups and the difference is not because of a sampling error, rather the girls in the Experimental Group are not at all used to consuming healthy drinks which troubles them and may even cause a lack of vital nutrients. Whereas girls in the Controlled Group are much better monitored by their parents and as a result, are compelled to consume milk on a regular basis while being restricted at the same time from consuming unhealthy soft drinks.

### **Girls consuming Grains and their derivatives**

Grain derivatives like Bread, Muffins, Noodles, pasta, rice and rolls and even Cereals were considered and data collected for both the groups to gain an insight into the grain consumption habits of young girls living in hostels of Kota. Since grains carry a lot of importance in the overall physical growth of girls, the figures bear a great significance.

**Table 4.16 Figures depicting number of girls in the Experimental group consuming grains and grain derivatives**

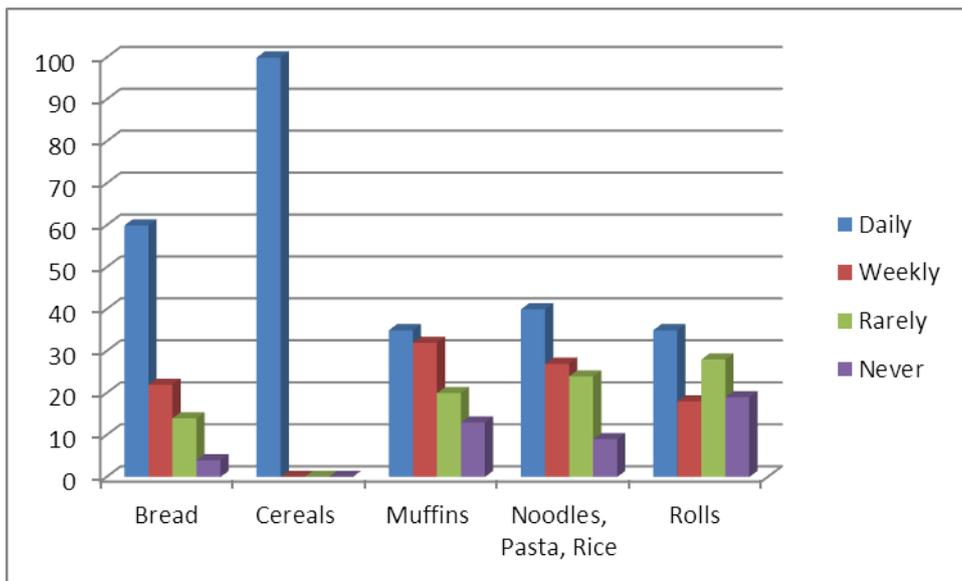
Category	Daily(%)	Weekly (%)	Rarely(%)	Never (%)
Bread	90	02	04	04
Cereals	95	03	02	0
Muffins	70	18	07	05
Noodles, Pasta, Rice	90	07	03	0
Rolls	80	12	07	01



**Fig. 4.12 Graph denoting grain consumption pattern of girls in the Experimental group**

**Table 4.17 Figures depicting number of girls in the Controlled group consuming grains and grain derivatives**

Category	Daily(%)	Weekly (%)	Rarely (%)	Never (%)
Bread	60	22	14	04
Cereals	100	0	0	0
Muffins	35	32	20	13
Noodles, Pasta, Rice	40	27	24	09
Rolls	35	18	28	19



**Fig 4.13 Graph plotting denoting number of girls in the Controlled group consuming grains**

**Table : 4.18 Application of statistical tools on figures denoting number of girls consuming grain derivatives**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group	892.6	94.026	19.26
Controlled Group	81.2	5.571	

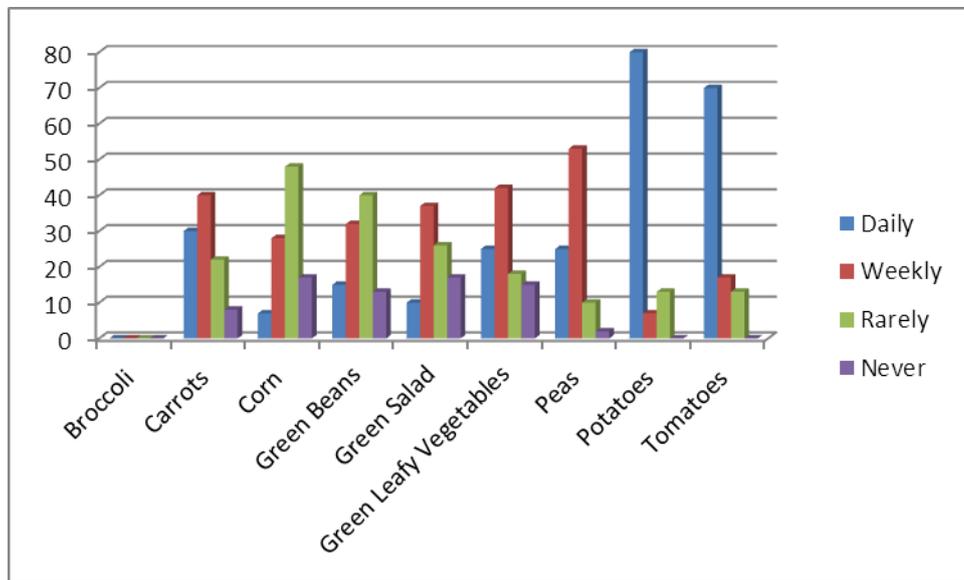
The significant t value clearly shows the great difference between the numerator and the denominator in the ratio and hence it could be deduced that there is no sampling error and the difference between the two means is of course a result of different environments the two groups are exposed to. It clearly indicates that girls in the Controlled group have to live under a constant parental supervision which keeps a tight check on what they eat whereas girls in the Experimental group get to eat what they choose to eat thereby making them more inclined towards foods that the girls in the Controlled group commonly stay away from.

#### **Girls consuming fresh vegetables**

A number of commonly cooked vegetables like carrots, corn, green beans, green salad, green leafy vegetables, peas and tomatoes were taken into consideration while questioning the girls and their responses were listed down in an order. The data thus procured helped us in understanding the frequencies and quantity in which these vegetables were being consumed by these girls which further helped us in deducing constructive results

**Table 4.19** figures depicting number of girls in the Experimental group consuming fresh vegetables

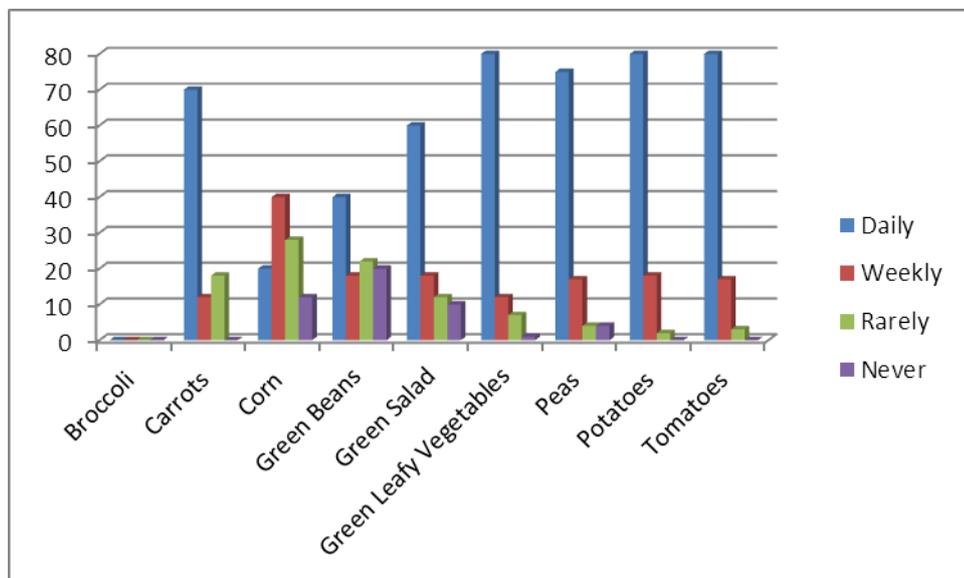
Category	Daily(%)	Weekly(%)	Rarely (%)	Never (%)
Broccoli	0	0	0	0
Carrots	30	40	22	08
Corn	07	28	48	17
Green Beans	15	32	40	13
Green Salad	10	37	26	17
Green Leafy Vegetables	25	42	18	15
Peas	25	53	10	02
Potatoes	80	07	13	0
Tomatoes	70	17	13	0



**Fig. 4.14** Graph denoting number of girls in the Experimental group consuming fresh vegetables

**Table 4.20 Figures clarifying number of girls in the Controlled Group consuming fresh vegetables**

Category	Daily(%)	Weekly (%)	Rarely (%)	Never (%)
Broccoli	0	0	0	0
Carrots	70	12	18	0
Corn	20	40	28	12
Green Beans	40	18	22	20
Green Salad	60	18	12	10
Green Leafy Vegetables	80	12	07	01
Peas	75	17	04	04
Potatoes	80	18	02	0
Tomatoes	80	17	03	0



**Fig. 4.15 Vegetable consumption pattern of girls in the Controlled group**

**Table : 4.21 Statistical calculation of number of girls consuming fresh vegetables**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group	344.125	268.67	2.607
Controlled Group	94.75	31.172	

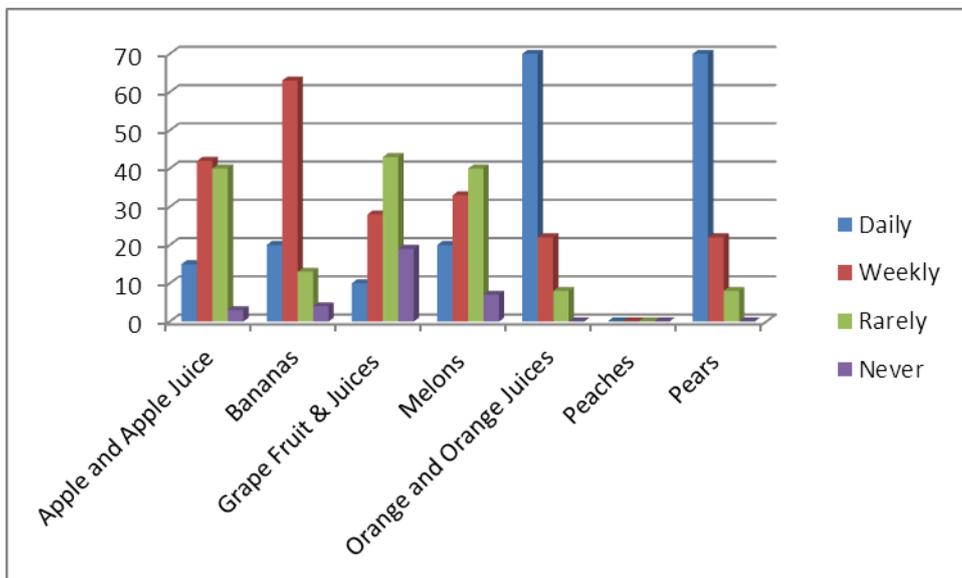
As it was specified earlier that a t-Test is a test of significance of difference between the respective means of the Experimental as well as controlled groups, the t ratio of 2.607 clearly reflects that the value of the numerator in the ratio is much higher than the denominator which indirectly validates the hypothesis. Thus the possibility of a null hypothesis stands cancelled. The above given table indicates that the difference in the means of two samples hasn't occurred as a result of sampling error, rather the difference has occurred as a result of the fact that the girls of the Controlled group are much better monitored and guided in their nutritive habits as compared to girls in the Experimental group where consumption habits are pretty much unhealthy and unhygienic. The comparative data has been plotted in a bar chart to exhibit the vegetable consumption habits and the stark contrast amongst the figures.

### **Girls having Fruits and Fruit juices**

The questionnaire even consisted of questions demanding answers regarding the fruit intake of young girls. Fruits like apples, bananas, grapes, melons, oranges, peaches and their juices play a vital role in developing the immunity of young girls and hence their responses to the questions gain a vital significance in deciding the quality of consumption. The data collected has been plotted in a table so that the comparative figures for Experimental and Controlled groups can be put against each other for a methodical analysis.

**Table 4.22 Values clarifying number of girls in the Experimental Group consuming fruits and fruit juices**

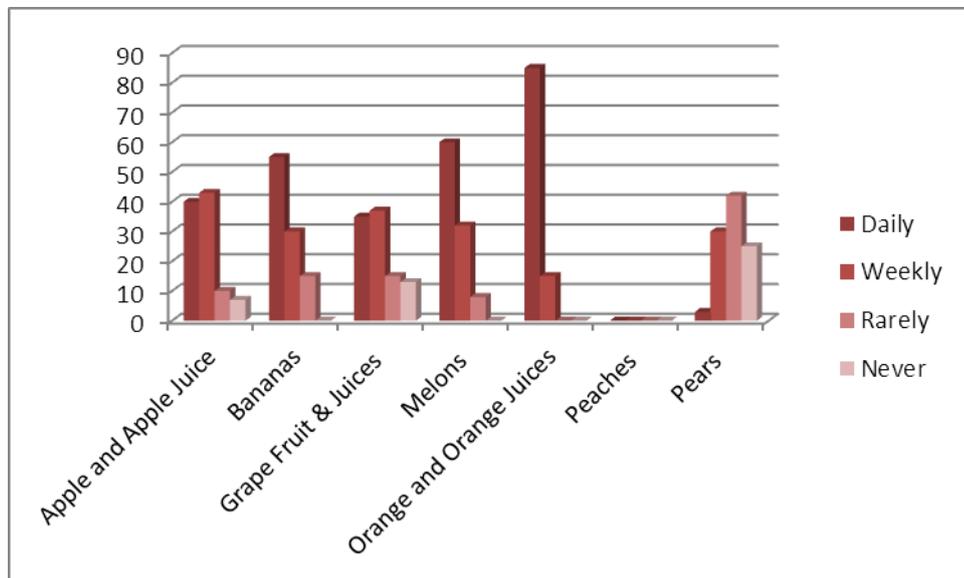
Category	Daily(%)	Weekly(%)	Rarely (%)	Never (%)
Apple and Apple Juice	15	42	40	03
Bananas	20	63	13	04
Grape Fruit & Juices	10	28	43	19
Melons	20	33	40	07
Orange and Orange Juices	70	22	08	0
Peaches	0	0	0	0
Pears	70	22	08	0



**Fig 4.16 Fruit consumption pattern of girls in the Experimental group**

**Table 4.23 Figures clarifying fruit consumption pattern among girls in the Controlled Group**

Category	Daily(%)	Weekly (%)	Rarely (%)	Never (%)
Apple and Apple Juice	40	43	10	07
Bananas	55	30	15	0
Grape Fruit & Juices	35	37	15	13
Melons	60	32	08	0
Orange and Orange Juices	85	15	0	0
Peaches	0	0	0	0
Pears	03	30	42	25



**Fig 4.17 Graph denoting fruit consumption pattern among girls in the Controlled group**

**Table : 4.24 Statistical calculation of girls consuming fruits and fruit juices**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group	241.66	229.13	1.808
Controlled Group	70.33	36.89	

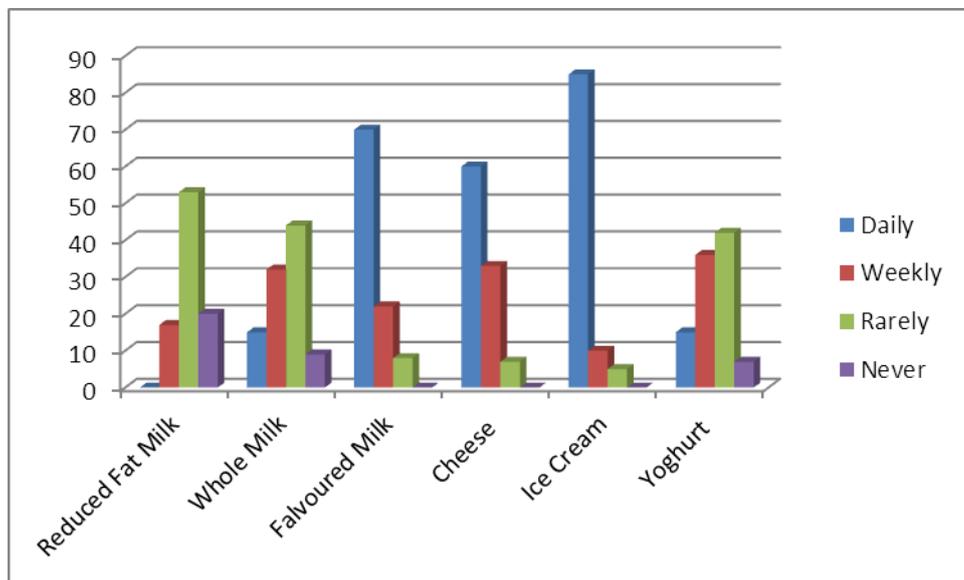
As is clearly visible from the figures that the t ratio of 1.808 is big enough to deduce that the difference between the numerator and the denominator of the ratio is too large and thereby indicates that the difference between the means is not because of a sampling error, it is rather a result of behavioural changes in fruit consumption. It indirectly hints at the fact that girls from the Experimental group are deprived of fruits and their juices which girls in the Controlled group get to have with quite regularity.

#### **Girls consuming milk and milk products**

It is normally seen that milk is the most ignored food product of all amongst the students who are not staying with parents as it is devoid of taste. Usually girls who stay with parents are forced to have milk daily as parents impose the habit upon them. Girls in the Experimental group avoid milk as much as possible and even if they try it once, it is usually the flavoured one which normally is skimmed and has already lost all the major nutrients. Milk is considered to be complete meal in itself as it contains vital nutrients like Vitamin A and calcium. The below given table consists of the data accumulated through the questionnaire to be analysed later.

**Table : 4.25 Figures depicting number of Experimental Group girls consuming milk products**

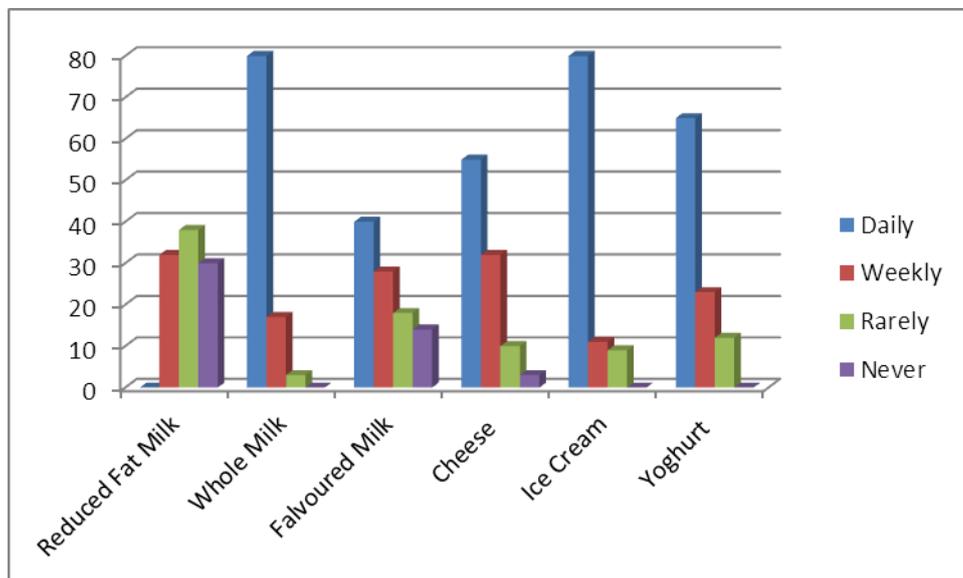
Category	Daily (%)	Weekly (%)	Rarely (%)	Never (%)
Reduced Fat Milk	00	17	53	20
Whole Milk	15	32	44	09
Falvoured Milk	70	22	08	0
Cheese	60	33	07	0
Ice Cream	85	10	05	0
Yoghurt	15	36	42	07



**Fig. 4.18 Graph denoting milk and milk product consumption pattern among girls in the Experimental group**

**Table : 4.26 Figures depicting number of Controlled Group girls consuming milk products**

Category	Daily (%)	Weekly (%)	Rarely (%)	Never (%)
Reduced Fat Milk	0	32	38	30
Whole Milk	80	17	03	0
Falvoured Milk	40	28	18	14
Cheese	55	32	10	03
Ice Cream	80	11	09	0
Yoghurt	65	23	12	0



**Fig 4.19 Graph denoting milk and milk product consumption pattern among girls in the Controlled group**

**Table 4.27 Statistical calculation of number of girls consuming milk products**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group	514.8	303.119	3.079
Controlled Group	96.2	22.894	

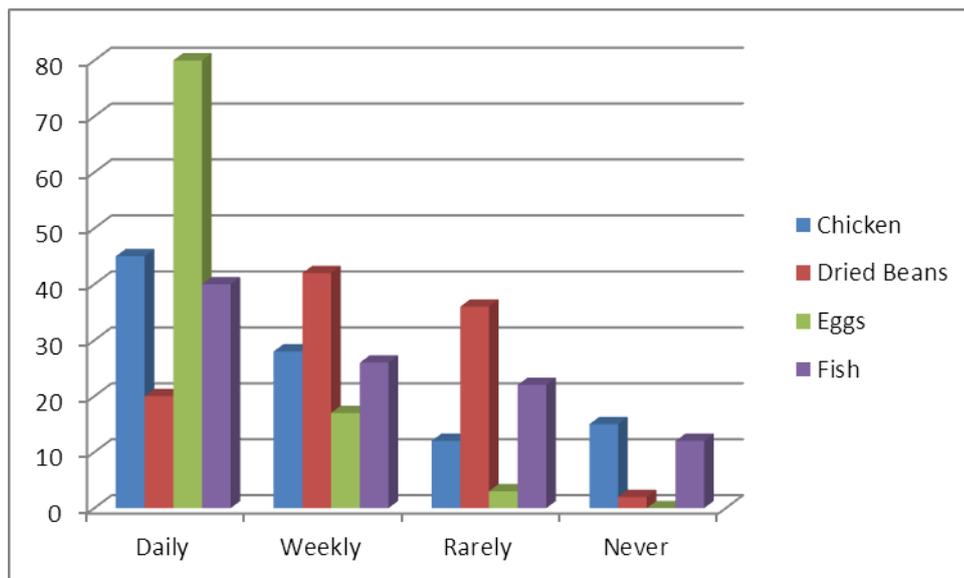
As the bar chart graph plotted above aptly shows that girls in the Experimental group are least interested in consuming whole milk on a daily basis simply because of the reason it's not accessible as compared to flavoured milk which can be found at every counter and is pretty much delicious and savoury. Whole milk contains vital nutrients in the right proportion and is therefore beneficial to the growth of youngsters. Consumption of ice cream is more amongst the Experimental group as compared to the Controlled group simply because of the taste whereas yoghurt is consumed more amongst the girls in the Controlled group. Further, the t value of 3.079 is big enough to suggest that there is a huge difference between the means of the Experimental and the Controlled group which in itself indicates that the difference exists between the milk product consumption habits of girls belonging to the two groups.

### **Girls consuming Meat and Meat Alternatives**

Traditionally majority of the girls are vegetarians as they are brought up in families where they are taught to be so in their families. Non vegetarianism is something that a girl learns either from her family right from her childhood or something that she develops as a result of staying alone with friends. Most of the meat and meat alternatives that the girls consume are at restaurants or at roadside vendors which in itself means it's unhygienic to a large extent. The girls were asked questions regarding their meat consumption habits and their responses were recorded to be tabled and analyzed later.

**Table : 4.28 Figures depicting number of Experimental Group girls consuming meat**

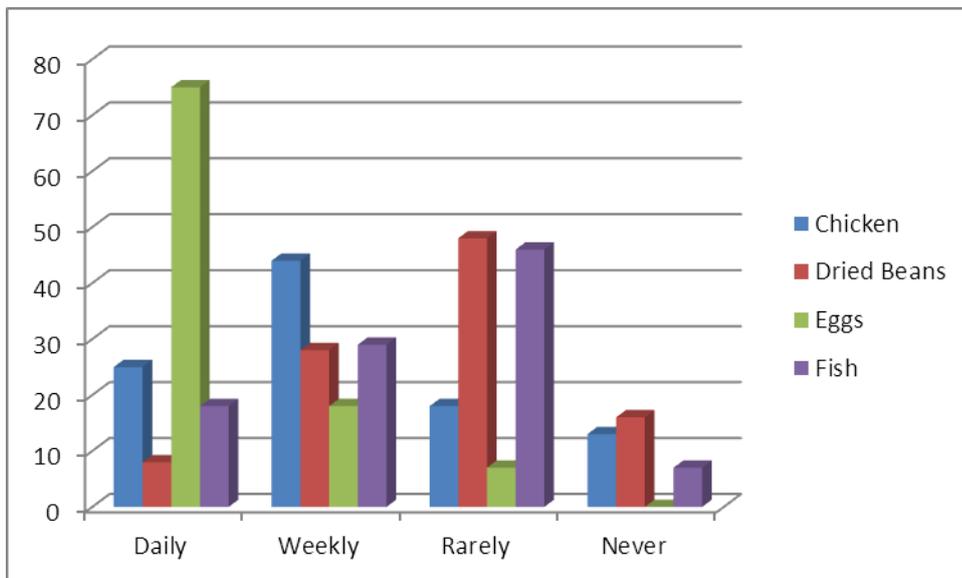
Category	Daily (%)	Weekly (%)	Rarely (%)	Never (%)
Chicken	45	28	12	15
Dried Beans	20	42	36	02
Eggs	80	17	03	0
Fish	40	26	22	12



**Fig. 4.20 Graph denoting meat and meat product consumption pattern among girls in the Experimental group**

**Table : 4.29 Figures depicting number of Controlled Group girls consuming meat and meat products**

Category	Daily (%)	Weekly (%)	Rarely(%)	Never (%)
Chicken	25	44	18	13
Dried Beans	08	28	48	16
Eggs	75	18	07	0
Fish	18	29	46	07



**Fig 4.21 Graph denoting meat and meat product consumption pattern among girls in the Controlled group**

**Table 4.30 Statistical calculation for number of girls consuming meat**

Group	Mean( $\bar{X}$ )	Standard Deviation( $\sigma$ )	t- Test
Experimental Group	485.75	226.94	3.806
Controlled Group	47.5	38.926	

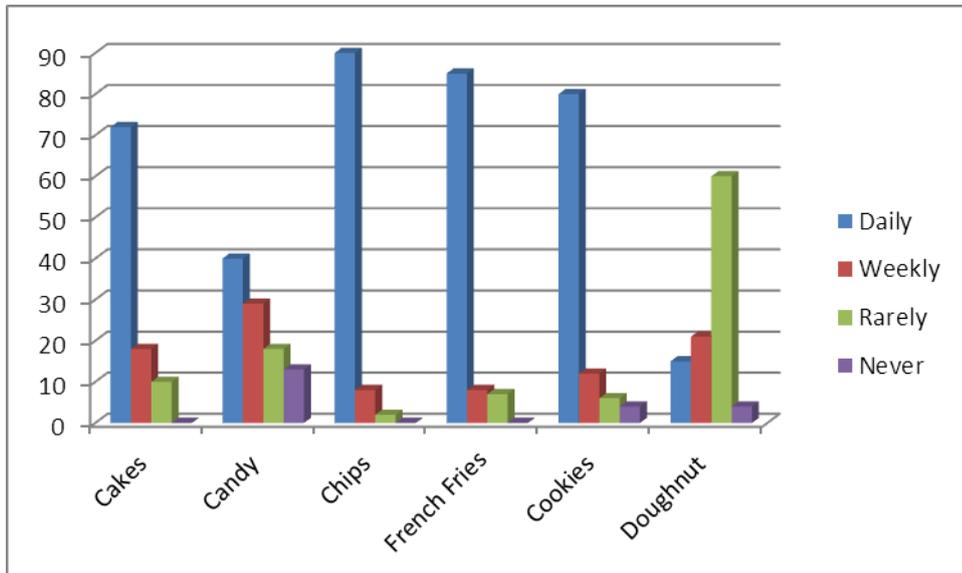
As the data plotted in the bar chart above clearly indicates that non vegetarianism is found more amongst girls in the Experimental Group as they are influenced more by their peers as compared to girls in the Controlled group where only those girls are non vegetarians who have learnt the habit from their respective families. There are quite a few girls in the Experimental Group who have picked non vegetarianism subconsciously as a result of staying with friends who are non vegetarians. As the calculated t value of 3.806 clearly suggests that the difference between the numerator and the denominator is substantial enough to infer that the distinction has occurred not as a result of sampling error but because of the fact that girls in the controlled group are better monitored than girls in the Experimental Group in their eating habits.

### **Girls consuming Fats and Sweets**

Cakes and chips constitute a major part of adolescent's diet as they commonly crave for something sweet, salty or spicy. Though the calorie intake is a bit too much, for these young girls salty wafers and sweet cakes are something that they can't ignore and consume it with an utter regularity. Sugar and salt contents in such foods are a bit in excess and regularity with such foods may lead to irreversible harms. Girls in the Experimental Group have a special penchant for such meals as they can get about it without much of an opposition from the parents. Girls were enquired regarding their consumption of Fats and Sweets and the figures were tabled to be analyzed later.

**Table : 4.31 Figures depicting number of Experiments Group girls consuming fats and sweets**

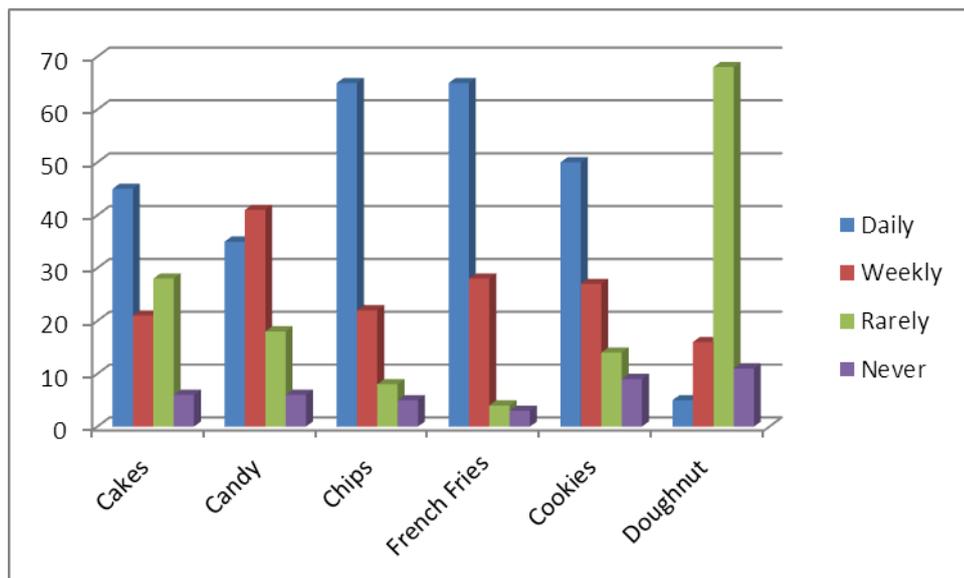
Category	Daily (%)	Weekly (%)	Rarely (%)	Never(%)
Cakes	72	18	10	0
Candy	40	29	18	13
Chips	90	08	02	0
French Fries	85	08	07	0
Cookies	80	12	06	04
Doughnut	15	21	60	04



**Fig 4.22 Graph denoting fats and sweet consumption pattern among girls in the Experimental group**

**Table : 4.32 Figures depicting number of Controlled Group girls consuming fats and sweets**

Category	Daily (%)	Weekly (%)	Rarely (%)	Never(%)
<b>Cakes</b>	<b>45</b>	<b>21</b>	<b>28</b>	<b>06</b>
<b>Candy</b>	<b>35</b>	<b>41</b>	<b>18</b>	<b>06</b>
<b>Chips</b>	<b>65</b>	<b>22</b>	<b>08</b>	<b>05</b>
<b>French Fries</b>	<b>65</b>	<b>28</b>	<b>04</b>	<b>03</b>
<b>Cookies</b>	<b>50</b>	<b>27</b>	<b>14</b>	<b>09</b>
<b>Doughnut</b>	<b>05</b>	<b>16</b>	<b>68</b>	<b>11</b>



**Fig. 4.23 Graph denoting fats and sweet consumption pattern among girls in the Controlled group**

**Table 4.33 Statistical calculation of number of girls consuming sweets**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group	659.83	300.7642	4.80
Controlled Group	66.66	30.7226	

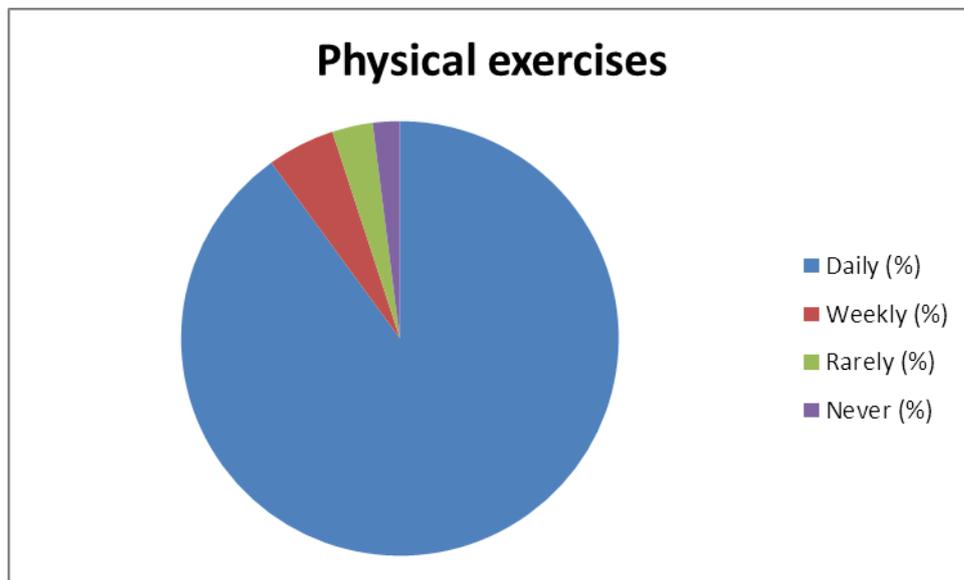
As the t value of 4.80 clearly suggests that the numerator of the ratio is much larger than the denominator which implies that the difference between the two means exists not as a result of sampling error rather the difference between the two means is significant enough to reach a conclusion that the girls in the Experimental Group are not controlled in their eating habits whereas girls in the Controlled group are monitored in their eating habits to a large extent by their parents and thereby get to consume this stuff much less.

#### **Girls participating in physical activities**

The girls were asked questions regarding their interest and inclination towards any kind of physical activity that they undertake in their leisure hours. Though these girls are in Kota for intense academic preparations, hence they can't afford much time for such activities, still the ones who can afford to go for some physical activity, and they too avoid it as they develop an indifferent attitude towards anything physically exhausting. Physical activities may include walking long distances, jogging, cycling or engaging in some sport. Their responses to the questions were tabled comparatively for both the groups, Experimental as well as Controlled and were plotted on a pie for a better analysis.

**Table : 4.34 Figures depicting number of experimental girls involved in physical exercises**

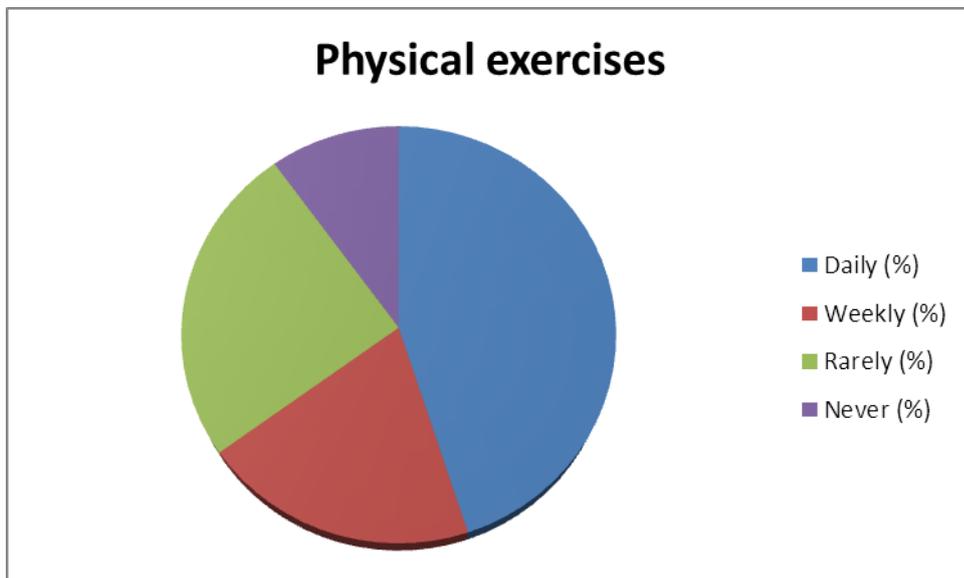
Category	Daily (%)	Weekly (%)	Rarely (%)	Never (%)
Physical exercises	90	05	03	02



**Fig. : 4.24 Graph denoting girls in the Experimental group involved in physical exercises**

**Table : 4.35 Figures depicting number of girls in Controlled group involved in physical exercises**

Category	Daily (%)	Weekly (%)	Rarely (%)	Never (%)
Physical exercises	45	20	25	10



**Fig. : 4.25 Graph denoting girls in controlled group involved in physical exercises**

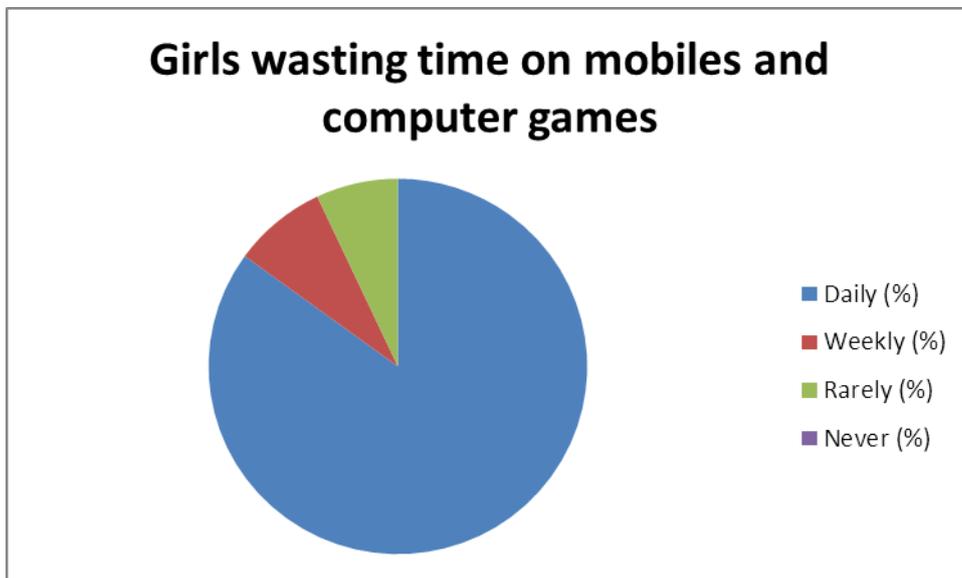
As the above given data suggests, majority of the girls in the Experimental Group get to walk a lot by default as most of them don't have any means to commute from one place to other and as such they have to walk most of the time which makes them go through enough physical rigours which keeps them agile and active to a certain extent. Quite on the contrary, girls in the Controlled group are under constant supervision of parents and are kept cocooned and pampered to an extent that they are not allowed to walk or ride a bicycle even if they want to. This may cause them metabolic problems in the long run. This seems to be one parameter where the girls in the Experimental Group have an edge over girls in the Controlled group.

### **Girls spending time watching TV, chatting on mobiles or playing computer games.**

The questionnaire even consisted of questions which sought answers regarding the kind of time girls spend watching TV or chatting on mobiles. The responses seemed to be a little tilted in favor of girls in the Controlled Group as better parental supervision keeps them in a tight check and doesn't let them waste their time in any useless and reckless activity. Mobile and computer games seem to be the major distracters for the girls in the Experimental group as they can pursue their wayward habits without much restraint from parents whereas girls in the Controlled group have to live under rigid checks and can't afford much time for such wasteful activities. These activities are not just time wasting but make the girls lethargic and more prone to many physical disorders. Data collected for both the groups was tabled and plotted on a pie chart for a better analysis.

**Table : 4.36 Figures depicting number of experimental group girls wasting time on mobiles and computer games**

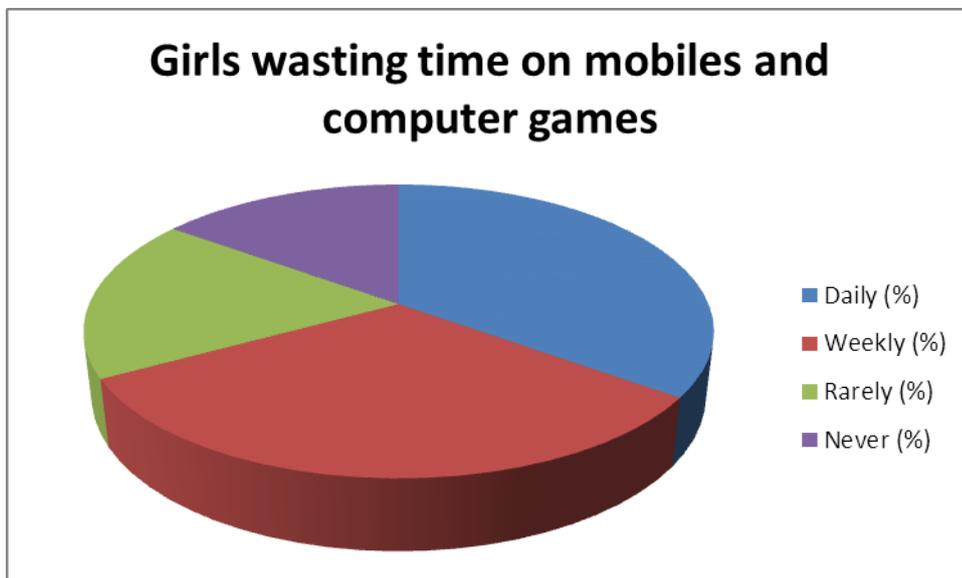
Category	Daily (%)	Weekly (%)	Rarely (%)	Never (%)
<b>Girls wasting time on mobiles and computer games</b>	85	08	07	0



**Fig. : 4.26 Graph denoting number of girls in Experimental group wasting time on mobile and computer games**

**Table : 4.37 Figures depicting number of Controlled group girls wasting time on mobiles and computer games**

Category	Daily (%)	Weekly (%)	Rarely (%)	Never (%)
<b>Girls wasting time on mobiles and computer games</b>	35	32	18	15



**Fig. : 4.27 Graph denoting number of girls in Controlled group wasting time on mobile and computer games**

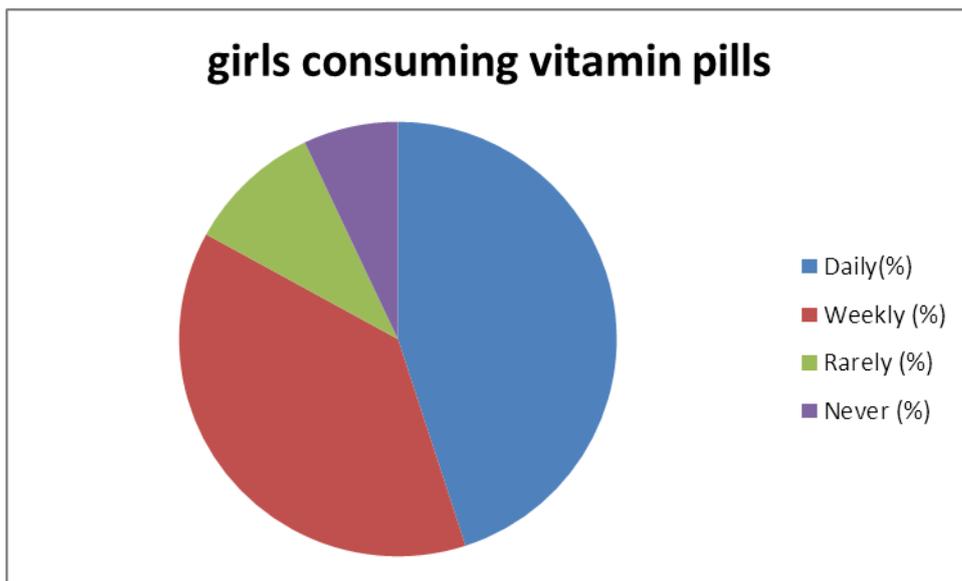
As the figures plotted on the pie suggest that girls in the Experimental group get to waste more time in wasteful activities like chatting on mobiles and playing computer games as they have nobody to restrict them, whereas girls in the Controlled group have to follow a strict regimen with the parents where such useless activities can't be indulged into. It is not just a hindrance to their studies but a serious drag on their health as well. Many girls are known to suffer from vision disorders and are often found visiting ophthalmologists, likewise they might even ignore their meals because of these wasteful activities which may cause them serious troubles in the days to come.

#### **Girls taking vitamins, herbal, folic acid, iron and calcium tablets**

The girls were also questioned regarding any vitamin or mineral tablets that they might be consuming on a doctor's prescription. These vitamin tablets are commonly prescribed by doctors when they perceive a problem persists as a result of certain mineral deficiency. Since majority of the girls in the Experimental group don't get to eat nutritious food which over a period of time causes lack of vital nutrients which necessitates a visit to a doctor. Data was collected via a questionnaire and was tabled for a comparative analysis between both the groups.

**Table : 4.38 Figures depicting number of experimental group girls consuming vitamin pills**

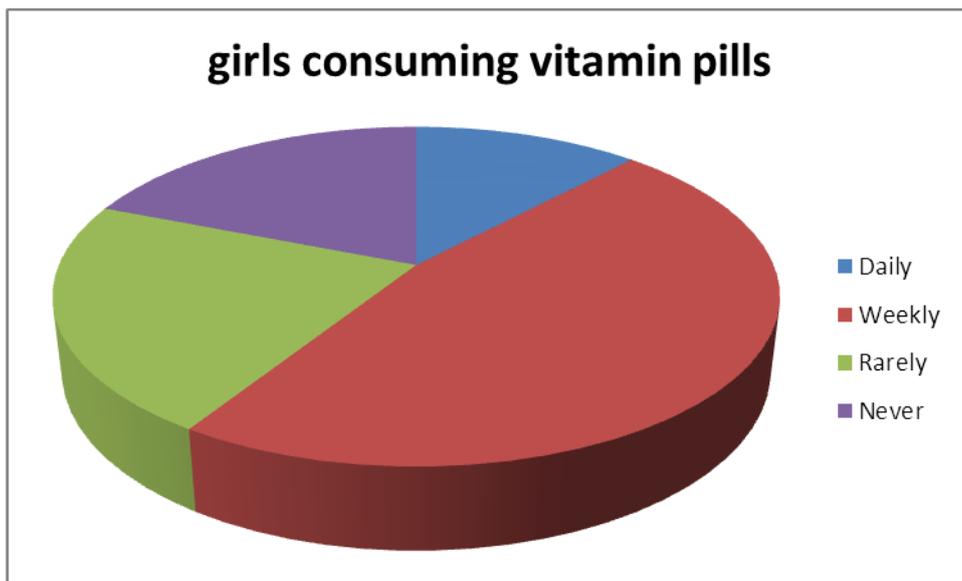
Category	Daily(%)	Weekly (%)	Rarely (%)	Never (%)
<b>Girls consuming vitamin pills</b>	45	38	10	07



**Fig 4.28 Graph denoting girls in the Experimental group consuming vitamin pills**

**Table : 4.39 Figures depicting number of Controlled group girls consuming vitamin pills**

Category	Daily (%)	Weekly (%)	Rarely (%)	Never (%)
<b>girls consuming vitamin pills</b>	12	47	22	19



**Fig. : 4.29 Graph denoting number of girls in Controlled group consuming vitamin tablets**

The above given data aptly suggests that girls in the Experimental group get to suffer mineral deficiencies more as a result of consuming food lacking nutrition and thereby their visits to a doctor and intake of mineral tablets exceeds that of Controlled group far more in frequency. It clearly indicates that girls in the Experimental group consume food that is high in empty calories and sparse in nutrition as compared to girls in the Controlled group who are strictly controlled in their eating habits by their parents and as a result get to eat home cooked nutritious stuff.

### **Girls consuming Alcoholic Drinks**

It was found that girls in the Experimental as well as the Controlled group are not interested in Alcoholic drinks as they are constantly advised by their parents not to do so. Not even one girl among the Experimental Group admitted to having alcohol, as consuming alcohol is normally a taboo and is either avoided by the girls or even the ones who supposedly do so, don't reveal it.

### **B. BODY IMAGE, DISORDERED EATING AND WEIGHT MANAGEMENT**

Most of the girls in the Experimental group confessed to missing confidence in their own body image which was of course a result of their disordered eating and carelessness towards managing their weight. The data collected was tabled to be analyzed methodically for an effective conclusion.

**Table : 4.40 Comparative figures of girls adhering to diet plans and worried about body image**

<b>Category</b>	<b>Experimental Group (%)</b>	<b>Controlled Group (%)</b>
Girls who are limiting food intake to lose weight	35	15
Girls having problem with appetite	45	30
Girls happy with body shape and size	30	45
Girls who feel out of control while eating	48	35
Girls who feel guilty about eating bad food	65	30
Girls with their moods depending on their weight	45	28
Girls using foods to comfort themselves	65	27
Girls spending long time thinking about food	47	35
Girls who vomit or think about vomiting	-	-
Girls using laxatives to prevent weight gain	35	18
Girls trying to hide how much they eat	70	63

As the data plotted above clearly indicates that a lot of girls from the Experimental Group are constantly worried and frustrated about their body shape. It may be a direct consequence of uncontrolled eating and disorders which most of the girls in the Experimental Group have to face. Further, lots of girls in the Experimental group also admitted to going on crash diets so as to lose weight somehow. This fact got duly corroborated when lots of girls in the Experimental group confessed that it happened many a times that they lost control on their eating and ate beyond their normal appetite. This clarifies the fact that a majority of girls in the Experimental group either eat too much or stop eating altogether.

### **24 Hour recall method**

Apart from checking the nutritional status of the girls through questions aimed at extracting details of their dietary habits, their likes and dislikes in terms of food, the menus they prefer, their erratic consumption habits, the classic mistakes they commit by either over-consuming or skipping meals, the questionnaire has also aimed at digging out a round the clock consumption schedule these girls follow by asking questions that specifically seek to know what these girls prefer eating with every passing minute they feel hungry. The data gained was informative enough and it was specially monitored to make it sure whether the information gathered somehow matched and justified the figures accumulated in the previous approach. If the information matches, it would justify the authenticity of the previous data, thereby proving to a large extent that the same set of girls didn't react differently to different questionnaires. It would also somehow lay a claim upon the fact that the girls chosen as a sample from both the groups were the perfect representatives of their respective groups and thereby their answers could be construed as the best possible figures to be analyzed for a result.

**Breakfast:** On an average it was found that girls consuming breakfast on a regular or irregular basis have certain common foods on the menu. These foods can be analyzed calorifically and a conclusion can be reached regarding average calories being consumed by girls early mornings through a breakfast. It can be

safely assumed as per sightings at different breakfast corners of Kota that girls in the age group 16 to 25 consume around 100 to 120 grams of Poha as breakfast. Different other breakfast items may vary in quantities a bit but not much of a difference occurs when an average consumption is taken into consideration. For example, a Kachori can be broadly considered to be around 80 grams and stuffed parathas can be assumed to weigh around 120 grams. If the nutrient contents of these edibles are tabled for an analysis, it might make the picture clear to a large extent. In the below given table various foods common in breakfasts have been evaluated in grams out of a diet considered to be around 80 to 120 grams.

**Table : 4.41 Various breakfast items and their energy equivalents**

Food	Mineral	Fats	Proteins	Carbohydrates	Fibre	Energy(Kcal)
Poha	2.36	15.23	9.47	83.43	0.48	508.3
Kachori	0.94	0.93	10.4	48.87	0.6	423.4
Samosa	0.48	0.48	6.08	43.73	0.27	203.1
Jalebis	0.83	0.65	5.65	86.65	0.42	553
Stuffed Parathas	1.26	0.91	5.36	34.54	0.88	277.3
Bread and butter	0.5	16.9	7.8	51.9	0.2	390.8
Sandwiches	0.3	17.8	7.8	80.5	1.9	410

\*A typical breakfast in a day could be considered any one out of the above given commonly available breakfasts usually offered at paying guest accommodations or at roadside vendors.

The above given table gives us a fair idea about the kind of calories these young girls consume in terms of a breakfast. The evaluation of nutrients is an average figure considering that not all girls in the Experimental group consume a breakfast every day but the ones who get to consume an average breakfast out of the given ones consume calories as defined above.

**Lunch:** Lunch is a common meal amongst girls from Experimental as well as Controlled group, as it is something that has been traditionally induced into their systems. Indian meals have a certain uniformity that cuts across the regions and whether it is a three course meal or a four course one, the factors remain almost unchanged irrespective of the mess or the paying guest facility they eat at. Apart from the major questions asked earlier regarding lunch preferences of girls, the 24 hour recall helped us to gain a valuable insight into lunch intake habits of girls and the factors influencing this habit. The responses were tabled for a calorific analysis.

**Table : 4.42 Energy equivalents of nutrients consumed during lunch**

Food	Mineral (in grams)	Fats (in gram s)	Proteins (in grams)	Carbohydrate s(in grams)	Fibre ( in gram s)	Energy(Kc al)
Pulses	0.24	10.36	0.735	17.97	1.05	194.4
Vegetable(La dies finger*)	0.7	10.2	1.9	6.4	1.2	125
Vegetable(Tin da)	0.5	10.2	1.4	3.4	1.0	111
Vegetable(Pot ato)	0.4	10.1	1.6	22.4	1.7	187
Vegetable(Bot tle gourd)	0.5	10.1	0.2	2.5	0.6	102
Curd	0.8	4.0	3.1	3.0	-	60
Salad	1.0	0.25	2.45	15.65	1.2	81.5
Roti	1.215	10.76 5	5.31	31.23	0.855	243.45
Total	3.985	35.57 5	13.495	74.25	4.305	704.35

\*Amongst the vegetables, only the ladies finger has been chosen to count the total calorific value of an ideal lunch considering the fact that a normal lunch plate consists of a single vegetable.

As the above given calorific count clearly indicates the average calories that a girl normally intakes in terms of lunch. The nutrients mentioned in grams have been calculated moderately on an average. Since lunch has already been indicated to be a meal that's common amongst both the groups as it's traditionally considered to be a filler and a meal that satiates the major hunger amongst the adolescents, the calories it contributes are the largest amongst all the meals that a girl takes in a day.

**Supper:** The last meal of the day doesn't seem to be as important as the lunch as the girls often tend to skip their dinner in favour of roadside snacks that are pretty much common in Kota. These snacks are commonly cooked in hydrogenated oil and can be considered downright harmful. Though on an average if a dinner is talked about, the contents are more or less similar to a lunch with the same vegetables being chosen with a painful regularity. Thus, the calories that are normally consumed in a lunch are almost the same as consumed in a dinner with almost the same menu being followed. The common contents of a dinner have been listed down in a table with their calorific details as the same would be used for an analysis later.

**Table : 4.43 Energy equivalents of nutrients consumed during supper**

Food	Mineral (in grams)	Fats( in gram s)	Proteins (in grams)	Carbohydrate s(in grams)	Fibre ( in gram s)	Energy(K cal)
Pulses	0.24	10.3 6	0.735	17.97	1.05	194.4
Vegetable(Ladi es finger)	0.7	10.2	1.9	6.4	1.2	125
Vegetable(Tin da)	0.5	10.2	1.4	3.4	1.0	111
Vegetable(Pota to*)	0.4	10.1	1.6	22.4	1.7	187
Vegetable(Bott le gourd)	0.5	10.1	0.2	2.5	0.6	102
Curd	0.8	4.0	3.1	3.0	-	60
Salad	1.0	0.25	2.45	15.65	1.2	81.5
Roti	1.215	10.7 65	5.31	31.23	0.85 5	243.45
Rice	0.18	0.15	2.04	23.46	0.6	103.50
Total	3.835	35.6 25	15.235	113.71	6.00 5	869.85

\*Amongst the vegetables, only the Potato has been chosen to count the total calorific value of an ideal lunch considering the fact that a normal lunch plate consists of a single vegetable.

As the data clearly suggests the nutrients consumed through a proper dinner are almost the same as a lunch thereby contributing comprehensively to the overall calories that the girls consume in a day. Although supper is something that is often missed by the girls and substituted by snacks which might result in a consumption of much higher calories which are more harmful than beneficial. Still the calorie count of supper will be considered while adding up the total calories being consumed in a day as ideally it would be worthwhile to assume that an average girl consumes all the three meals in a day apart from the filler snacks that she might munch upon as and when she gets the time to do so either in the noon or late in the evenings before dinner.

### **Snacks:**

Snacks are considered to be a meal that these adolescents require the least as they do more harm than good. Snacks are either consumed somewhere late in the noon when there is a large gap between a lunch and a dinner like 3pm to 4pm in the noon when the dinner time is still far away. It was found that girls in the Experimental group are more inclined towards snacks as their lunch and dinner could often be considered to be not as satiating as compared to the meal that girls in the Controlled group get to eat. Common snacks consumed on an average by a girl in a day are wafers, French fries, pakodis, chola bhaturas, pav bhajis, aloo badas and bread rolls. Often these are complemented with a bottle of soft drink around 300ml a day. The calories that the girls consume through common snacks on an average in a day can be calculated via rough estimates.

**Table : 4.44 Energy equivalents of nutrients consumed in the form of wafers**

<b>Snacks</b>	<b>Mineral (in grams)</b>	<b>Fats (in grams)</b>	<b>Proteins (in grams)</b>	<b>Carbohydrates (in grams)</b>	<b>Fibre (in grams)</b>	<b>Energy (Kcal)</b>
Wafers	0.6	30.1	1.6	22.6	0.4	187
Pakodis	03.64	50.62	23.2	65.04	5.74	870.6
Chola Bhaturas	01.8	03.1	14.05	67.4	02.1	354
Bread rolls	0.3	01.2	08.6	63.2	0.4	293.5
Pav Bhaji	01.26	25.31	12.12	112.1	02.56	560.6
French Fries	0.6	100.1	01.6	22.6	0.4	997
Patty	1.2	1.0	12.6	96.5	0.7	445
Soft drink(300 ml)	-	0	0	11	-	44

\*A typical snack in a day could be considered any one out of the above given snacks along with a 300 ml of soft drink.

Snacks are usually consumed to compensate for the loss of either a lunch or a dinner. As the snacks could be considered heavy enough in calories as well as sufficiently satiating, it can well be assumed that a late evening snack would kill any desire to have a dinner till late in the night. The same could be presumed for an afternoon snack which could easily make a girl miss her lunch.

**Table : 4.45 Average calorie consumption**

**Average calories consumed by a girl living in a hostel in a day**

<b>Food</b>	<b>Mineral (in grams)</b>	<b>Fats (in gram s)</b>	<b>Proteins (in grams)</b>	<b>Carbohydrat es(in grams)</b>	<b>Fibre ( in gram s)</b>	<b>Energy(K cal)</b>
Breakfast(P oha)	02.36	15.23	09.47	83.43	0.48	508.3
Lunch	03.985	35.57	13.495	74.25	4.305	704.35
Dinner	3.835	35.62 5	15.235	113.71	6.005	869.85
Total	10.18	86.42 5	38.2	271.46	10.79	2082.5

The above given calories have been evaluated for an average girl belonging to the Experimental Group and the results seem to be pretty much evident. The nutrients calculated above for the girls in experimental group were pitted against the nutritive figures recommended by ICMR (Indian Council Of Medical Research) for adolescent girls in their highly acclaimed book '**Nutritive value of Indian Foods**' authored by C.Gopalan, B.V.Ramashastry and S.C.Balasubramanian of National Institute of Nutrition, Hyderabad. ICMR has come up with a standard chart recommending certain nutrients and their ideal dosages required by young

girls on a regular basis. The figures are tabled below to be compared with the figures that were found for the girls living in the hostels.

**Table : 4.46 Recommended dietary allowances as per ICMR**

<b>Age group</b>	<b>Energy(Kcal/day)</b>	<b>Proteins(gms/Day)</b>	<b>Fats(gms/day)</b>
16 to 18	2060	63	22
18 to 25	1875	50	20

As the given figures clearly suggest that not much of a difference exists between the energy intake of girls in the Experimental group as compared to the recommended ICMR figures.

Recommended ICMR Energy intake is 2060Kcal for girls between 16 to 18 in age group and 1875 Kcal for girls between 18 to 25 in age as they are considered to be sedentary workers and thereby not in a need to make extra physical efforts. These figures are more or less similar to the figure of 2082.5 Kcal calculated for the girls of Experimental group which means the girls in this group are consuming almost the same energy per day as prescribed by the ICMR but majority of this is in the form of fats and not in the form of proteins as recommended. The prescribed consumption of fats in a day should be 20 to 22gms whereas the fat consumption calculated on an average for girls living in hostels is somewhere around 86.425gms a day which is far too much on any scale. On the contrary, the prescribed figure for protein consumption in a day is between 50 to 63gms whereas the value calculated for the girls in the Experimental group is just a mere 38.2gms of proteins a day which seems too less on an ideal scale. Girls in this age group require a slightly liberal dosage of protein as it enhances the ability of cells to grow and repair themselves in case of damage which makes proteins vital to this age group. Thus it can be safely predicted that the girls in the Experimental group are getting to consume fats on a much higher scale as compared to the one recommended which is downright unhealthy whereas they miss out on a healthy dosage of proteins which is crucial to growth in this age group.

### **Calories consumed by girls in the Controlled group**

As compared to the Experimental group, the girls in the Controlled group get to eat much healthier food which is a lot more hygienic than the food available at roadside vendors where the oil used is hydrogenated because of overuse. Further, girls in the Controlled group are exposed to better nutrients because of the regular and hygienic food they have to adhere to. Like the breakfast may normally consist of a glass of milk which in itself is a form of food and consists of vitamins vital to a balanced growth of human body. Further, they even get to consume seasonal fruits and fruit juices as they are forced to do so by their parents. Even eggs and omelettes are more hygienically served at home as compared to how they normally are at street corners amongst filth and squalor. Even the lunch may consist of a glass of butter milk again considered to be a source of good health, the vegetables are normally fresh and cooked in branded refined oils whereas usually what the girls in Experimental group get to eat are stale and semi rotten vegetables cooked in shoddy oil that could be called spurious at best. At home they are rarely offered deep fried food with lots of spices; rather they are more often than not offered moderately fried stuff with balanced spices. The calories that girls in the Controlled group consume on an average can be tabled with a certain degree of approximation.

**Table : 4.47 Average calorie consumption for girls in the Controlled group**

Food	Mineral (in grams)	Fats(in grams)	Proteins (in grams)	Carbohydrates (in grams)	Fibre (in grams)	Energy (Kcal)
Breakfast(Poha + a glass of milk)	03.96	28.23	18.07	93.43	0.48	742.3
Lunch	05.595	48.12	25.545	77.4	4.305	878.35
Dinner	03.835	35.625	15.235	113.71	6.005	869.85
Total	13.39	111.975	58.85	284.54	10.79	2490.5

As the calculated figures aptly suggest, most of the girls in the Controlled group derive maximum energy out of protein consumption which in this age group matters a lot as compared to getting energy out of fat consumption. Their protein consumption is quite in the range prescribed by the ICMR. Moreover, majority of the girls in the Controlled group get to eat with a schedule instead of the erratic pattern followed by the girls in the Experimental group which makes it even healthier for them. All in all the figures deduced out of the given data indicate a depressing figure for girls in the Experimental group as staying away from parents comes at a heavy cost. The girls in this group don't get to relish those very nutrients that are the most needed for a balanced and healthy growth whereas they get to gorge upon empty calories devoid of immunity boosting elements which in the long run may prove to be a serious drag on their physical well being.

**Table : 4.48 Source of food**

Category	Breakfast(%)	Brunch (%)	Lunch (%)	Dinner (%)	Lat evening meal (%)	Fruit (%)	Food or beverages break, snack, alcohol beverage(%)	Other (%)
Hostel Mess/Tiffin centre	82	62	88	72	0	0	-	-
Restaurant/cafe/teria/ fast food shop	06	15	05	12	-	-	07	-
Food stall/hawker	09	10	05	10	12	10	85	-
Supermarket/food store	01	0	0	0	0	0	08	-
Other than hostel mess	01	10	0	0	45	0	0	
Homemade	01	0	0	0	31	0	0	-
Friend / relative's home	0	03	02	06	12	0	0	-
Party/ BBQ/banquet/special event	0							

## 4.2 INTERVENTION

As it is an interventional program aimed at counseling the girls in the Experimental group so as to bring about a visible change in their nutritional status, the data was collected keeping in mind the distinctive circumstances which force the girls in the Experimental group to lead a life different from that of girls in the Controlled group. Intervention was only aimed at girls in the Experimental group as it was firmly assumed that girls in the Controlled group have to live under strict checks and thereby have a balanced meal schedule with least scope of consumption that could be called erratic. The intervention wasn't that easy as it entailed counseling the girls living in the hostels against their wishes, counseling them regarding the best possible meals available, nutritious food that could be selectively opted with a judicious discretion, food that could be consciously avoided and all this was done through motivational charts, posters and a couple of seminars that were organized at a few chosen hostels where the girls were intimated beforehand, about a week prior to the conducting of seminars so as to ensure a decent gathering. Pamphlets were distributed amongst the girls of the target hostels carrying information regarding healthy meals and perfect timings.

It was not just the girls who were influenced; even the mess owners and cooks at paying guest houses were educated in two specially organised meets regarding what actually constitutes a healthy meal, the nutrients that could be included to make a meal healthy and worth consuming. Posters and charts were displayed on the walls and they were made aware of the need to cook hygienically so as to get the best out of what they offer.

The counseling for girls lasted about 3 months, a prolonged period which comprised intense coordination with girls at different hostels, educating them at each meeting, coercing them to go for healthy meals, persuading them to develop a routine with breakfast and lunch and making them aware of the importance of fruits and milk at regular intervals instead of unhealthy snacks at roadside vendors. The objective was to bring about a perceptible change in their dietary habits, though not much was expected out of it considering the fact that such youngsters are moody and more fallible to their immediate temptations.

The counseling even included making the girls aware about the serious fallouts of uncontrolled and undisciplined dietary habits. Being away from parents gets them used to eating absolutely unhygienic food and the counseling aimed at inculcating the habit of avoiding the unhealthy and accepting the healthy food. Though these three months didn't mean being in touch with the chosen girls in the Experimental group all the time, it definitely brought about a certain sense of regularity in the discourse that was imparted to the girls and it was something that was responsible for the visible change that could be perceived amongst the girls 3 months later. Though the result wasn't substantial enough to boast about but it definitely asserted the fact that intervention didn't go waste, it definitely achieved a result that it meant to. Certain parameters where the results were quite overtly perceived have been tabled along with the comparative figures calculated before the counseling so as to get a fair idea about the scale of change and also to justify whether the change really mattered.

#### **4.3 CHANGE IN NUTRITIONAL STATUS**

One positive development that counseling brought about was in the nutritional status, especially amongst the girls who were regular visitors to fast food restaurants. It was found that there was a reduction in the number of girls wishing to visit fast food joints on a regular basis. They were clearly informed about the lethal impact of fast food junk and the message probably got through.

**Table : 4.49 Table signifying change in habits after intervention**

<b>Before Intervention (%)*</b>	<b>After Intervention (%)*</b>
10	06

\*Figures above depicting girls visiting fast food joints.

As the figures above efficiently depict that the number of girls visiting fast food joints reduced marginally probably as a result of counseling. Though the change was miniscule, it was a welcome change as it somehow validated the efficacy of intervention.

#### **4.4 CHANGE IN THE NUMBER OF GIRLS CONSUMING FRESH LEAFY VEGETABLES**

Since intervention was not just aimed at keeping the girls away from unhealthy food, it simultaneously aimed at encouraging the girls to eat healthy meals like green leafy vegetables, carrots and green beans. Again there wasn't any drastic or sudden change expected in the habits of these girls, still mild improvements could be detected in their habits concerning consumption of vegetables.

**Table : 4.50 Table signifying change in dietary habits after intervention**

<b>Vegetables</b>	<b>Before Intervention (%)</b>	<b>After Intervention (%)</b>
Green Leafy Vegetables	25	40
Salad	10	35
Green beans	15	20
Carrot	30	35

As the data given above quite satisfactorily proves the efficiency of counseling these young girls as it impacted a positive change in the number of girls opting green leafy vegetables once they were counselled about the perceptible benefits of vegetables. It was a change for the better as it ensured a better health for the youngsters.

#### **4.5 CHANGE IN THE NUMBER OF GIRLS CONSUMING FRUITS AND FRUIT JUICES**

Intervention brought about a change in the number of girls consuming fresh fruits. It's normally seen that girls living in hostels don't often get to eat fresh fruits as they either don't find fruits in vicinity or they aren't much inclined towards eating fruits. They are found to be normally oblivious about the benefits of fruits and the wonders they work for human health. Though the change was not substantial enough to be counted important but it was enough to remotely suggest that intervention made a change in the dietary habits of girls.

**Table : 4.51 Figures signifying change in fruit consumption habits of girls**

Fruits	Before Intervention(%)	After Intervention(%)
Banana	20	35
Oranges	70	75
Grapes	10	20
Melons	20	25

The data given above aptly suggests that the girls who attended the counseling sessions underwent a positive change in their fruit eating habits. They, at least started consuming seasonal and commonly available fruits like bananas and Oranges which are a vital source of important nutrients like calcium and Vitamin C which in itself indicates a desire to be healthy.

#### **4.6 GIRLS CONSUMING BREAKFAST**

As was discussed earlier, breakfast assumes a role of tremendous importance in the life of youngsters, since in this growing age; they need a meal early in the morning to keep them going. Majority of these young girls living in the hostels are quite indifferent towards the importance of breakfast and ignore it most of the time quite oblivious of the harmful consequences of missing a breakfast. Intervention worked quite positively as far as girls in the Experimental group are concerned. It's quite evident from the below given comparative figures that intervention brought about a small but significant change in the breakfast eating habits of youngsters. Though the change is not remarkable as was expected but it was big enough to be considered notable.

**Table : 4.52 Figures signifying change in the number of girls consuming breakfast after intervention**

<b>Before Intervention (%)*</b>	<b>After Intervention (%)*</b>
15	35

\*Figures given above represent girls consuming breakfast daily

The data posted above clearly justifies a major change in the number of girls consuming breakfast daily which is a positive sign and indicates that intervention effected a change worth noting. As is evident from the figures, a lot many girls were found taking regular breakfasts when they were finally contacted after a prolonged 3 months counseling session.

#### **4.7 GIRLS CONSUMING AFTERNOON SNACKS**

Snacks are considered to be unnecessary fillers irrespective of when they are taken. They are high on empty calories with salt in excess. This excessive salt may lead to abnormal blood pressures as the girls grow in age. Quite unmindful of these drawbacks, these girls gorge upon snacks which gradually add on to their body weights and can be one of the major causes of obesity later. Most of the snacks are deep fried and if taken at roadside vendors there is always a fear of hydrogenated oil being used which is even more detrimental to the health of youngsters. The data posted below gives a fair idea about the change that intervention brought about in the snacks consumption habit of these young girls. Intervention made them aware of the serious long term repercussions of snacks which possibly encouraged a lot of them to change their habits.

**Table : 4.53 Figures depicting change in the number of girls consuming snacks after intervention**

Before Intervention (%)*	After Intervention (%)*
65	45

\*Above given figures represent girls consuming afternoon snacks daily

As it's evident from the data, girls who attended the counseling sessions felt a need to change their habits which also brought about a change in their bodily well being as was observed later. It was also observed that eating snacks at odd hours kills the desire to have proper meals at the right time which may add on to the complexity of things. As the girls shed the habit of going for a packet of snacks, it might have also rejuvenated their hunger for the right meals at scheduled hours.

#### **4.8 GIRLS CONSUMING UNHEALTHY DRINKS**

Intervention proved to be beneficial for the girls in the case of unhealthy drinks too. Aerated drinks are known to contain soda which is considered to be harmful beyond an extent and if taken in a regularity. Especially the excess sugar contents in these drinks which make them even more lethal. Sugar to an extent is a source of energy but too much of it for a prolonged period of time may cause diabetes amongst these youngsters. Not only that, excess sugar is even known to cause sudden weight gain and as such a regular intake of soft drinks may gradually result in an increase in blood sugar levels associated with uncontrolled obesity. Though girls are a lot image conscious but their erratic meal consumption patterns incline them towards a whimsical craving for snacks and soft drinks. Below given figures make it amply clear that intervention brought a positive change in the attitude of girls towards soft drinks.

**Table : 4.54 Table signifying change in the number of girls consuming unhealthy drinks after intervention**

<b>Before Intervention (%)*</b>	<b>After Intervention (%)*</b>
81	65

\*The data posted above indicates number of girls consuming soft drinks 2 to 3 times a week.

As the data quite evidently suggests that intervention made the girls aware about the harmful effects of soft drinks and some of them consciously decided to cut down on the quantitative intake of soft drinks thereby cutting down their weights also as we found later.

#### **4.9 GIRLS CONSUMING HEALTHY DRINKS**

Consuming milk is a habit that is rarely found in girls living in the hostels. Even though they consume milk while they are with their parents but as they join a hostel, they give up the habit of having milk on a regular basis, may be because they don't get it in vicinity or there is nobody to inspire them to go for milk regularly as the parents do it at home. The milk that they get to have is usually the fat free one which is flavoured and contains preservatives. The whole milk which usually the parents serve is not available at hostels. Intervention made the girls aware about the necessity of consuming milk in regularity and brought about a certain change in the milk consuming habits of girls. The below given figures adequately clarify the developments that took place after intervention.

**Table : 4.55 Table signifying a positive change in number of girls consuming healthy drinks**

<b>Category</b>	<b>Before Intervention(%)*</b>	<b>After Intervention(%)*</b>
Girls consuming Fat free milk	35	20
Girls consuming whole milk	12	25

\*Figures given above indicate the number of girls consuming milk 2 to 3 times a week.

As the data posted above clearly shows that a lot many girls started consuming the whole milk in preference over the flavoured, bottled, fat free milk as they got aware of the significance of whole milk and the important nutrients that it possesses. It was a welcome change as it indirectly indicated that the intervention worked to a certain degree of satisfaction.

#### **4.10 GIRLS CONSUMING FATS AND SWEETS**

Even fats and sweets increase in consumption while girls are staying away from parents. Deep fried snacks, doughnuts and cakes are common amongst young girls and they are high on sugar and fats. Intervention brought about a positive change in their sweet consuming habits. Cakes and French fries are fillers and may satiate their hunger for a while thereby killing their desire to have a proper meal. A prolonged and regular consumption of such fat rich foods also high on sugar may cause the girls to pick weight and thereby become obese. Intervention proved to be quite effective as the data given below clearly depicts.

**Table : 4.56 Table signifying change in the number of girls consuming fats and sweets**

<b>Fats and Sweets</b>	<b>Before Intervention(%)*</b>	<b>After Intervention(%)*</b>
Cakes	72	55
Chips	90	72
French fries	85	70

\*Data given above depicts number of girls consuming fats and sweets 2 to 3 times a week.

As the figures tabled above quite clearly demonstrate the reduction in the number of girls consuming fat and sweet rich foods which was a positive development and proved the authenticity and efficacy of intervention. Since the intervention went on for a period of 3 months, it was a long enough time to convince certain number of girls to give up on foods rich in fats and sweets. Though the change that occurred wasn't substantial but it was big enough to be counted upon. It further brought about a weight loss amongst certain obese girls which came as a consequence of cutting down upon sweets and deep fried foods.

#### **4.11 CHANGE IN HEALTH PROBLEMS EXPERIENCED BY GIRLS**

Intervention didn't just bring about a change in the nutritional status; it also affected a change in the health and medical problems that lots of girls were experiencing. Changing their erratic lifestyles and eating habits wasn't that easy and not many changes could be seen in the way the girls conducted themselves; still the minor changes that occurred in their eating habits effected a change in the ailments and common physical traumas most of them were going through. Since they were counselled to start eating nutritious and healthy stuff instead of junk that they usually ate, some of them took the counseling seriously and reformed their erratic ways. The data that was gathered later showed up the positive impact of counseling and is tabled below for comparison with the previous data.

**Table : 4.57 Figures signifying change in the number of girls experiencing medical problems after intervention**

<b>Ailments</b>	<b>Before intervention (%)</b>	<b>After intervention (%)</b>
Anorexia	30	25
Anaemia	68	60
Obesity	68	58

The comparative figures given above quite clearly demonstrate the earnestness with which the intervention was conducted and the impact it had on the health of young girls. Though there aren't any major reductions in the problems faced by girls, yet the minor changes that could be detected in the physical well being of the girls made the intervention look pretty effective.

Though we have limited figures to prove the efficacy of Intervention, a general chat later with the girls who were counselled sprang up many surprises. A lot many girls had started consuming fruits and milk with lots of stress on breakfast. Many had started concentrating on regular meals at scheduled hours with special emphasis on green leafy vegetables which might have somehow rectified their iron deficiencies and made them rich in calcium. As there were many girls who happily admitted improvement in their menstrual cycles and thereby more physical and mental relief. Some of them even admitted a perceptible relief in their backaches. All in all intervention looked a lot morale boosting and effective though the figures weren't that encouraging.

**Table 258 Nutrition Quality of life after Educational Intervention**

<b>S.no.</b>		<b>Before Educational Intervention (%)</b>	<b>After Educational Intervention (%)</b>
1.	Ate enough food to be satisfied	48	55
2.	Had plenty of choice in the food I ate	32	36
3.	Was hungry between meals	33	36
4.	Sneaked food	46	47
5.	Tasted and enjoyed foods without guilt	38	41
6.	Took time to eat the food that was best for me	49	53
7.	Took time to shop and prepare the food that was best for me	44	45
8.	Liked the way I look	37	44
9.	Liked the way my clothes fit	55	65
10.	Beat myself up when I ate the food I felt I shouldn't have	33	38
11.	Took time for myself	37	42
12.	Was pleased with the way I managed what I ate	41	44
13.	Was confused about the food I should eat	38	43
14.	Rewarded myself with food	40	42
15.	Was happy about the food I ate	46	49

16.	Felt that food was controlling me	39	44
17.	Felt that changing the food I ate would make life more enjoyable for me	26	29
18.	Felt frustrated about limiting the food I ate	57	50
19.	Was angry that I had to change what and how I ate	53	47
20.	created stress with my family/friends over my food needs	42	39
21.	Was nagged by my friends/family about the food I ate	49	46
22.	Had someone I could talk to who understood the struggles I have had with food	36	41
23.	Found it difficult to stick to the food I thought I should eat while with family/friends	48	43
24.	Knew what type of food I should have been eating for my healthy lifestyle	34	42
25.	Knew the amount of food I could eat	37	41
26.	Made healthy food choices	27	33
27.	Ate the recommended amount	17	32
28.	Ate when I should have	23	25

29.	Felt confident that I could trust myself when faced with difficult food choices	26	34
30.	Felt confident that I would be able to live the rest of my life with these changes in my food	27	35

## SECTION II

### 4.12 HYPOTHESIS JUSTIFIED

#### Hypothesis 1 justified: Difference in food preferences

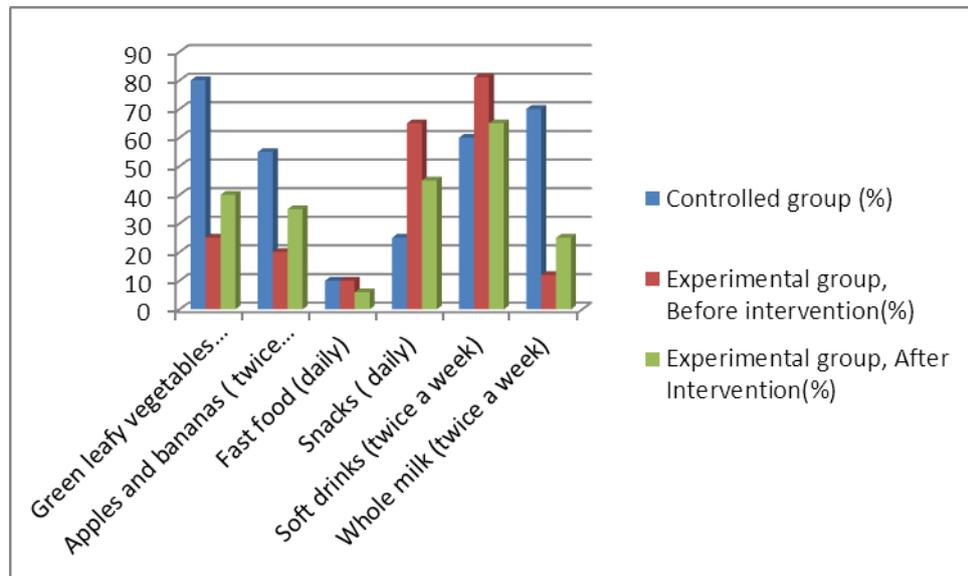
1. Since girls belong to different regions and are brought up in different circumstances, their food preferences and eating behaviour are pretty much contrasting. The below given figures taken out of the previous data are tabled below to justify the hypothesis.

**Table : 4.59 Table depicting differences in food preferences**

Type of food preferred	Controlled group (%)	Experimental group, Before intervention(%)	Experimental group, After Intervention(%)
Green leafy vegetables (twice a week)	80	25	40
Apples and bananas ( twice a week)	55	20	35
Fast food (daily)	10	10	06
Snacks ( daily)	25	65	45
Soft drinks (twice a week)	60	81	65
Whole milk (twice a week)	70	12	25

**Table 4.60 Statistical calculation of tools denoting food preferences of girls**

Group	Mean( $\bar{X}$ )	Standard Deviation( $\sigma$ )	t- Test
Experimental Group (before)	373	287.54	0.0355
Experimental Group (after)	378	189.896	



**Fig. : 4.30 Differences in food preferences plotted on a bar graph**

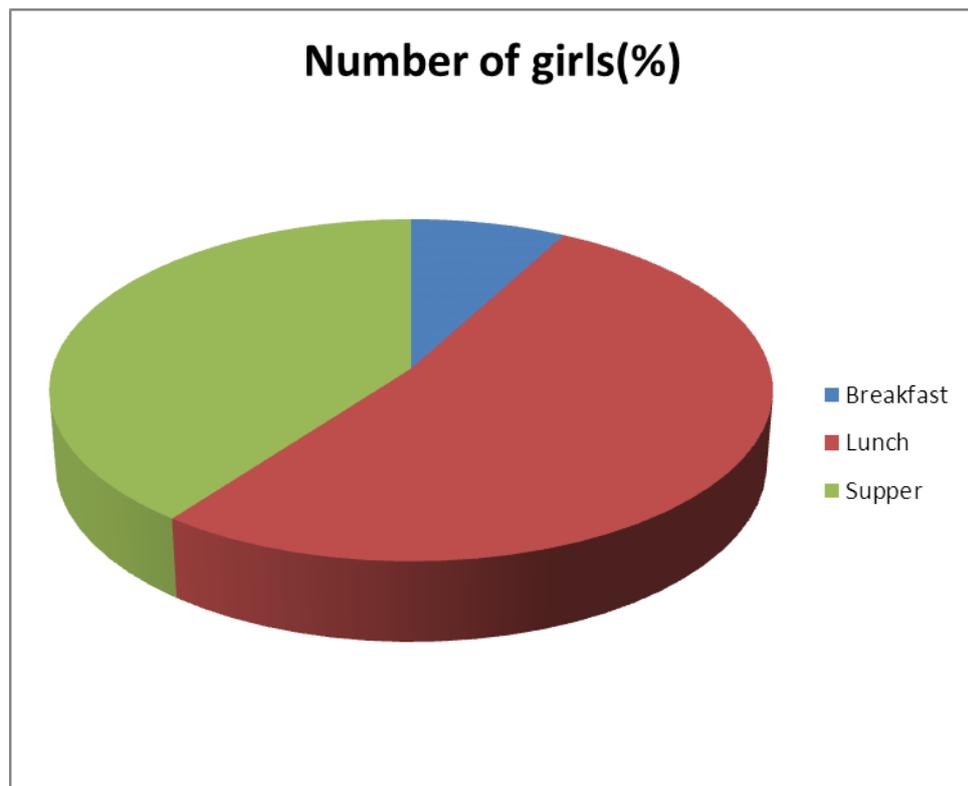
The t-value of 0.0355 clearly indicates that the difference between the numerator and the denominator is not big enough to suggest that a change occurred due to the process of intervention. A miniscule change in the habits was recorded which of course reflects that adolescents don't get much affected by such counseling sessions. The bar graph posted above sufficiently indicates that the food preferences of girls living in the hostels are quite different from each other despite being of the same age group. Further, even the eating behavior among the girls is not the same. They all lie in the same age group but it doesn't mean that they have similar eating habits. Their eating patterns differ a lot based on many factors.

### **Eating Behavior**

It's not just the food preference that differs, in fact the pattern which most of the girls living in the hostels follow also varies a lot. It's found that discipline while eating is something that's rarely found among adolescents, the pattern they follow is erratic at best and as such the data accumulated previously was referred to for the purpose of matching our hypothesis with the results achieved.

**Table : 4.61 Figures depicting differences in eating behaviours**

<b>Eating Pattern( daily)</b>	<b>Number of girls (%)</b>
Breakfast	15
Lunch	100
Supper	76



**Fig. : 4.31 Graph denoting differences in eating behaviours**

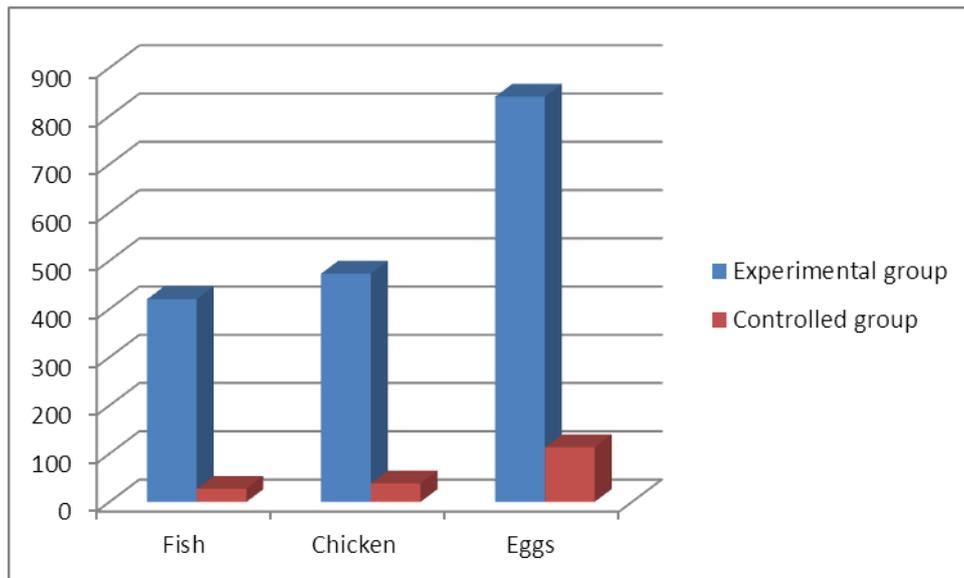
As the figures extracted out of the previous tables clearly reflect that only 15% girls living in the hostels consume breakfast everyday whereas the remaining are found to be either missing it or consuming it rarely which again proves that different girls have different eating behaviors and thus what we had assumed as hypothesis 1 while starting off turned out to be justified.

**Hypothesis 2 justified: The effect of family background on the dietary pattern of girls**

The family background affects the dietary pattern of adolescents as is pretty much evident from the figures. This difference is commonly visible amongst meat eating and vegetarian girls. The girls who belong to families where non-vegetarian food is a norm can't adjust with a diet that is completely vegetarian. Similarly eggs are considered to be a non-vegetarian diet but still have a nominal acceptability amongst the girls. The data tabled below clarifies a lot.

**Table : 4.62 Figures depicting effect of family background on the consumption pattern of girls**

Type of non-vegetarian food	Experimental group	Controlled group
Fish	420	27
Chicken	473	38
Eggs	840	113



**Fig. : 4.32 Figures depicting the effect of family background plotted on a bar**

**Table 4.63 Statistical calculation of data denoting meat eating pattern of girls**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group	577.66	186.755	4.70
Controlled group	59.33	38.212	

As the bar graph posted above clearly reflects that the number of girls eating fish and chicken are 40% and 45% respectively, which means there is a sizable quantity of girls in the Experimental group who are purely vegetarian thereby proving the authenticity of hypothesis 2 that the family background affects the eating habits of adolescents. Further the t value of 4.70 is too big and suggests that there are major differences between the consumption pattern of girls and result out of their respective family backgrounds.

- Moreover, it's found that girls with more number of siblings have to suffer a lot in terms of lack of rich diet as parents with more number of children are usually not able to afford quality and healthy diet for all of them.
- Same is found true when it comes to living in hostels as only rich parents are able to afford AC rooms for their wards and majority of middle class parents prefer putting their children in Non-AC rooms.

**Hypothesis 3: Knowledge of nutrition is significant in maintaining good health**

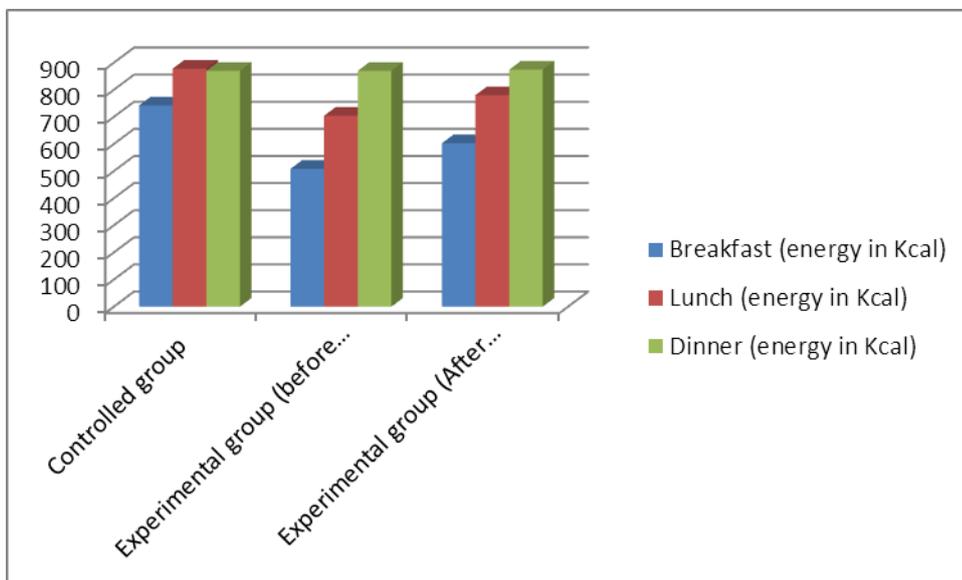
It's always beneficial to have a good knowledge of nutritional needs of the body. Girls in the Controlled group have a much better knowledge of what they need in terms of nutrition as they are constantly in touch with parents and are therefore better guided all the while. The figures tabled below are quite an evidence to the fact:

**Table : 4.64 Table depicting how knowledge of nutrition affects the overall calories consumed by adolescents**

<b>Category</b>	<b>Controlled group</b>	<b>Experimental group (before intervention)</b>	<b>Experimental group (After intervention)</b>
<b>Breakfast (energy in Kcal)</b>	<b>742.3</b>	<b>508.3</b>	<b>602.5</b>
<b>Lunch (energy in Kcal)</b>	<b>878.35</b>	<b>704.35</b>	<b>780.23</b>
<b>Dinner (energy in Kcal)</b>	<b>869.85</b>	<b>869.85</b>	<b>874</b>
<b>Total</b>	<b>2490.5</b>	<b>2082.5</b>	<b>2256.73</b>

**Table 4.65** Figures depicting statistical calculation of tools denoting change in calories after intervention

Group	Mean( $\bar{X}$ )	Standard Deviation( $\sigma$ )	t- Test
Experimental Group (before)	694.166	147.777	0.541
Experimental Group (after)	752.243	112.592	



**Fig 4.33** Graph denoting change in calories after intervention

As the data posted above clearly suggests that girls living away from parents don't have much of a knowledge regarding a healthy nutrition which leads to physical traumas whereas girls in the Controlled group have a healthy lifestyle as they are constantly handled by parents and as such their knowledge of nutritional needs is much better and are better able to choose what they need to eat for a healthy lifestyle. As it was clear through hypothesis 1 also, the food preferences of girls in the Controlled group are much healthier as compared to girls in the Experimental group. As the data clearly reflects there was a minor improvement in the overall calories consumed by the girls in the Experimental group after the intervention. The t value of 0.541 is pretty small and indicates that not much of a change occurred but the little change that was noticed somehow validated the intervention.

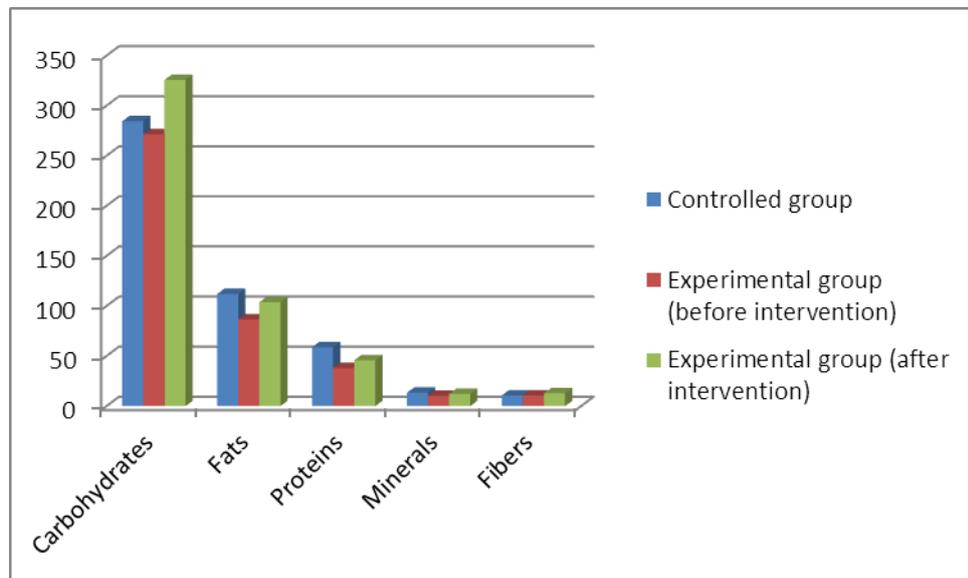
**Hypothesis 4: Consumption of different types of diets results in different levels of macronutrients and micronutrients thus bringing about a change in energy levels.**

As it was quoted earlier that energy levels depend a lot on the kind of meals we consume on a regular basis. Further, the meals that we consume are a mix of various macronutrients and micronutrients that decide to a large extent what energy levels we possess for the day. To justify the hypothesis, the energy table has been quoted once again:

**Table : 4.66 Table signifying average calories consumed in a day**

\* Average calories consumed by a girl living in a hostel in a day

Nutrients	Controlled group	Experimental group (before intervention)	Experimental group (after intervention)
Carbohydrates	284.54	271.46	325.752
Fats	111.975	86.425	103.71
Proteins	58.85	38.2	45.84
Minerals	13.39	10.18	12.216
Fibers	10.79	10.79	12.948



**Fig.4.34 Graph depicting nutrient consumption pattern of girls in a day**

**Table 4.67 Figures denoting statistical calculation of nutrient consumption of girls**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group (before)	83.411	98.032	0.243
Experimental Group (after)	100.093	117.639	

As the data quoted above clearly reflects that majority of calorific values are consumed through lunch and dinner which consist of maximum macronutrients like fats and proteins whereas breakfasts contain good quantity of Carbohydrates which are an instantaneous source of energy. Further, girls in the Experimental group are found to be missing their breakfast which means they consume maximum energy out of lunch and dinner which means excess consumption of fats. Moreover, as the data also shows more quantity of fats in lunch as compared to proteins, this is an unhealthy practice. In this growing age, the quantity of proteins should be much higher. The same stands true for micronutrients as well. Hypothesis 4 thus stands justified. Further the t value of 0.243 is too small which invariably indicates that not much of a difference occurred as a result of interventional program. The adolescents attending the interventional seminars seemed interested but changing their habits drastically through a motivational sermon didn't work as it was expected to.

**Hypothesis 5 justified: Health problems due to lack of nutritious food.**

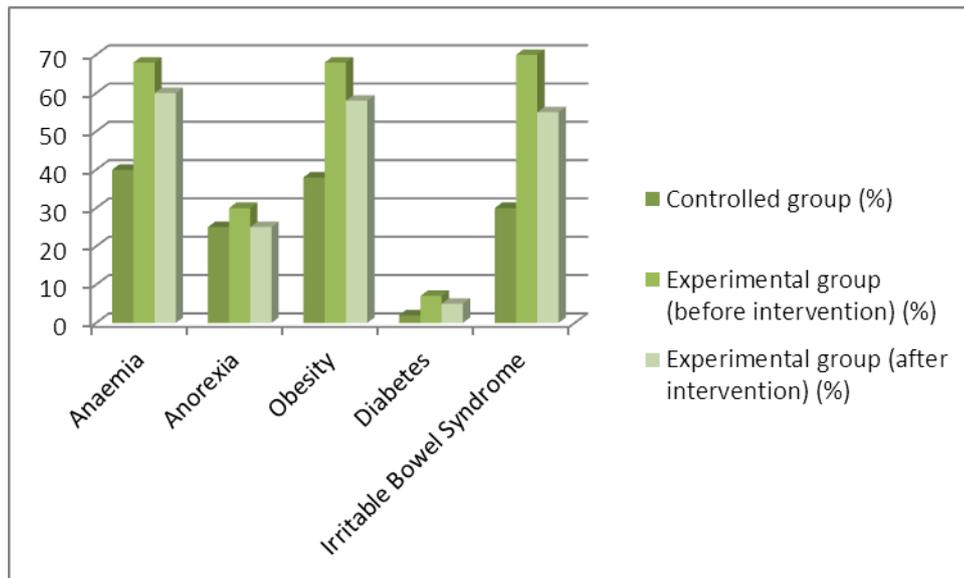
As the data presented earlier was quite a proof to suggest that girls in the Experimental group are not at all habitual of consuming healthy food like green leafy vegetables and whole milk which deprives them of all the healthy nutrients like iron, folic acid, calcium and vitamin A which manifests itself in many ailments. The data can be quoted once again to justify the hypothesis:

**Table : 4.68 Figures depicting health problems due to lack of nutrition**

Diseases	Controlled group (%)	Experimental group (before intervention) (%)	Experimental group (after intervention) (%)
Anaemia	40	68	60
Anorexia	25	30	25
Obesity	38	68	58
Diabetes	02	7.04	05
Irritable Bowel Syndrome	30	70	55

**Table 4.69 Statistical calculation of number of girls suffering from health problems**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group (before)	510.4	269.063	0.5296
Experimental Group (after)	426.6	229.741	



**Fig. 4.35 Bar chart denoting change in health problems after intervention**

The data tabled above clearly proves that girls in the Experimental group are more disadvantaged as compared to girls in the Controlled group. While living at hostels, nutritious food is a rarity which has already been proved and thus health problems among girls in the Experimental group are more. There is a vast gap in the health status of girls as it clearly reflects in the data. Hypothesis 5 thus stands proved. Further, the t value of 0.5296 is pretty small and somehow indicates that not much of a change occurred as a result of intervention.

**Hypothesis 6 justified: Factors affecting weight management in girls.**

There are several girls living in the hostels consuming too much of unhealthy meals and having an unhealthy lifestyle. Their consumption pattern can be defined through the below given factors which seem to be the reason behind the ailments they often pick:

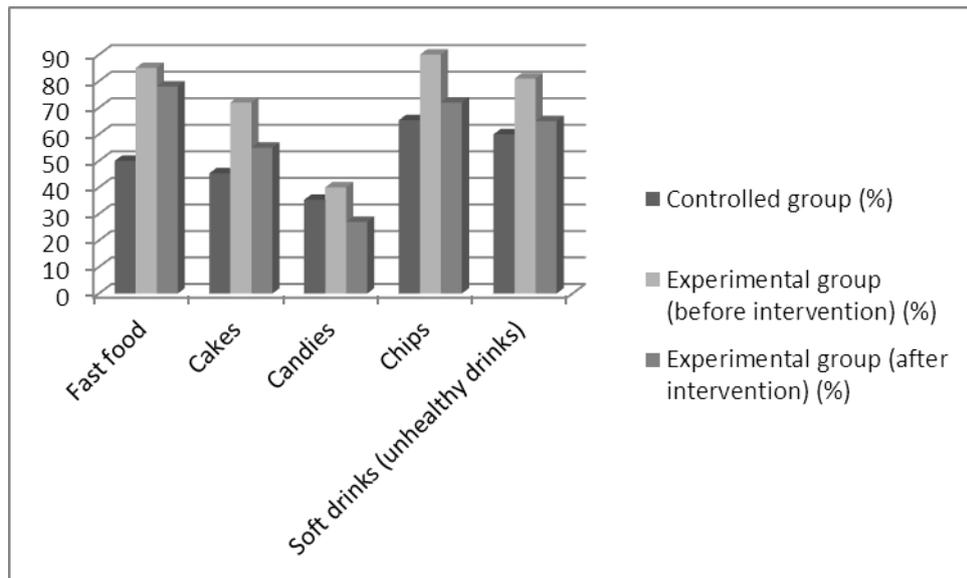
1. Most of the girls staying at hostels tend to pick fast food on a routine which is high on salt and is usually made out of finely ground flour which is proclaimed to be unhealthy for the intestines.
2. Food comprising fats and excess sugar, snacks on a regular basis, extra sweet soft drinks which together is a typically unhealthy blend of food and causes obesity amongst the girls.
3. Further, none of them is into any kind of physically rigorous and exhaustive regimes that could keep her in shape. These all reasons add up together to result in extra kilos that the girls put on while being at the hostels as the figures discussed below suggest.
4. All the more these girls are under a heavy stress of studies which may cause emotional as well as physical turbulences and can be considered to be one of the few reasons behind imbalanced health.
5. Some girls are even under medication for certain disorders they might have picked earlier and these medicines over a prolonged period of time may cause obesity. Further, adolescent girls even tend to consume certain pills all by themselves as they derive temporary relief out of them. These medicines may sometimes lead to incurable imbalances in their health.

**Table : 4.70 Figures depicting factors affecting weight management**

<b>Type of food</b>	<b>Controlled group (%)</b>	<b>Experimental group (before intervention) (%)</b>	<b>Experimental group (after intervention) (%)</b>
<b>Fast food</b>	<b>50</b>	<b>85</b>	<b>78</b>
<b>Cakes</b>	<b>45.33</b>	<b>72</b>	<b>55</b>
<b>Candies</b>	<b>35.33</b>	<b>40</b>	<b>27</b>
<b>Chips</b>	<b>65.33</b>	<b>90</b>	<b>72</b>
<b>Soft drinks (unhealthy drinks)</b>	<b>60</b>	<b>81</b>	<b>65</b>

**Table 4.71 Figures depicting statistical calculation of factors affecting weight management**

<b>Group</b>	<b>Mean(<math>\bar{X}</math>)</b>	<b>Standard Deviation(<math>\sigma</math>)</b>	<b>t- Test</b>
Experimental Group (before)	773	187.064	0.5296
Experimental Group (after)	624	187.960	



**Fig 4.36 Bar chart denoting factors affecting weight management**

As the data above quite clearly reflects that a vast majority of girls are consuming absolutely unhealthy food that is high on sugar, fats and salt which gradually makes them obese. Thus, it could be firmly established that too much of this unhealthy stuff disturbs the weight management amongst the girls. Further, none of them is found involved in any kind of physical activity except walking which makes it even more complicated for them to manage their weight. Hypothesis 6 thus stands justified. Further, a t value of 1.256 is quite small and indicates a mild difference between the numerator and the denominator which somehow reflects that not much of an intended change occurred as a result of intervention.

**Hypothesis 7 justified: Improvement in nutritional status because of diet counseling.**

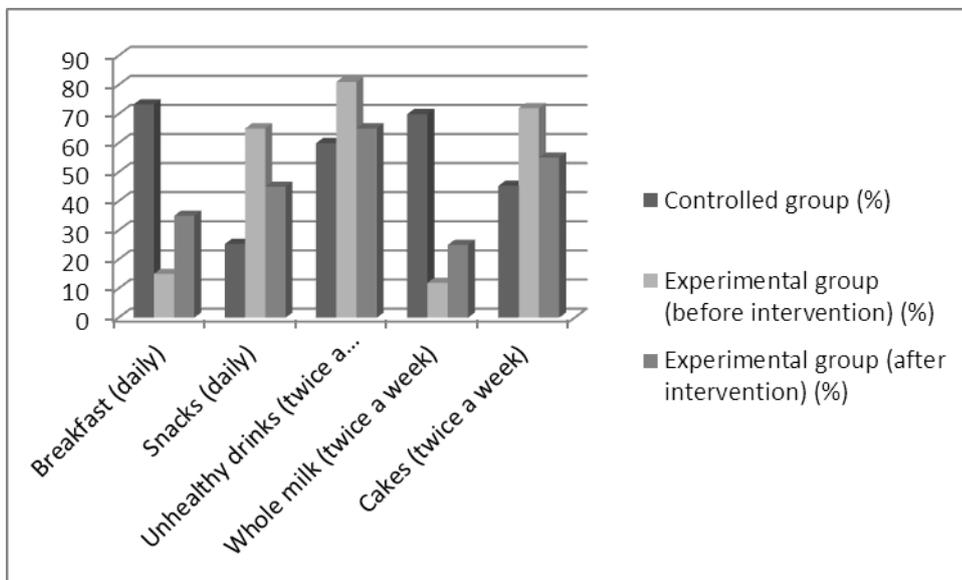
The interventional Program brought about a noticeable change in the dietary pattern of girls as the figures discussed earlier and given below duly suggest:

**Table : 4.72 Table signifying improvement in dietary status after counseling**

<b>Category</b>	<b>Controlled group (%)</b>	<b>Experimental group (before intervention) (%)</b>	<b>Experimental group (after intervention) (%)</b>
<b>Breakfast (daily)</b>	<b>73.33</b>	<b>15.04</b>	<b>35.04</b>
<b>Snacks (daily)</b>	<b>25.33</b>	<b>65.04</b>	<b>45.04</b>
<b>Unhealthy drinks (twice a week)</b>	<b>60</b>	<b>81.04</b>	<b>65.04</b>
<b>Whole milk (twice a week)</b>	<b>70</b>	<b>12</b>	<b>25.04</b>
<b>Cakes (twice a week)</b>	<b>45.33</b>	<b>72</b>	<b>55.04</b>

**Table : 4.73 : statistical calculation depicting change after counseling**

Group	Mean( $\bar{X}$ )	Standard Deviation( $\sigma$ )	t- Test
Experimental Group (before)	514.8	291.281	0.285
Experimental Group (after)	473	148.492	



**Fig. : 4.37 Figures depicting change in dietary status plotted on a bar chart**

As the data posted above quite amply suggests that there was a change in the nutritional status of the girls, though the change wasn't remarkable but it is surely worth noticing which hereby proves the authenticity of the interventional program. Though, the t value of 0.285 is pretty small and suggests a very meager but a positive reform in the dietary status of girls as a result of intervention. Hypothesis 7 can thus be proclaimed justified.

## Chapter - V

### FINDINGS AND REVELATIONS

## 5.1 FINDINGS AND REVELATIONS

Assessing the girls living in the hostels of Kota for their dietary intake was a tedious job as it entailed a judicious usage of research tools in the right measure which in itself was a challenge to cope up with. The hurdles were multifold as finding the subjects, interviewing them, getting them to reveal the patterns they employ while consuming their meals, their preferences, their special whims that characterize their eating habits and the factors that affect their food choices. These adolescent girls were found to be moody to a large extent as they normally preferred eating more outside as compared to a routine meal usually offered at their mess as they are more experimenting in their behavior as compared to adults. This adventurous attitude of adolescents while consuming meals often puts them in troubles like digestive disorders, chronic ailments that may linger on forever. Still, for these youngsters eating at one place seems to be outright boring and they keep seeking a change whenever possible. Whatever suits their palate, they go for that irrespective of how beneficial or how harmful it will turn out to be. The research concentrated primarily on collection of data through questionnaires and interview schedules decided beforehand. The data was then processed through research tools which seemed the best in terms of results desired. Though utmost caution was exercised while collecting data, an almost miniscule margin of error was always anticipated as all the respondents were adolescents and expecting them to be true and perfect in their responses was a bit too much.

The collection of data was not just difficult in terms of respondents' attitude while answering questions; it even posed a great difficulty while searching for the right set of adolescents who readily answered the questions with an ease and aplomb. Naturally, we had to encounter many such adolescents who were the most unresponsive and didn't show any inclination in answering our questions. Further, putting the data to test through tools revealed certain facts that were quite indicative of what was anticipated. These facts have been the result of careful processing of data keeping in view the special conclusions being sought. Staying away from parents doesn't just come with a sense of independence but brings also the ease of eating what they wish to without any parental interference or guidance

that seems unwanted. When parents meddle, they do it with a purpose and ensure that a child gets to eat the best in terms of nutrition that could help in the overall physical as well as mental growth. But for the girl staying alone, this sense of compulsion seems missing and she exercises her free will in choosing what suits her taste the best even though it might be a bit compromising in terms of nutrition but qualifies on the issue of taste. They seem driven more by friends and their immediate whims that dictate what they eat rather than the concept of nutrition that should actually be the factor that plays a decisive role. The study has sprung up a lot and now the data needs to be put through an analysis to get to a result that could be genuinely called the findings of the study.

As it was clearly justified in the analysis part that the hypothesis we started off with proved to be true. It was found that the food preferences and eating behaviour of the girls differ a lot. The intervention also didn't bring about much of a difference in the preferences of girls as the t-test has suggested.

Analysis of the data also proved that family background of the girls matters a lot in deciding their eating pattern even when they are not living with their parents.

It was also proved beyond doubt that the knowledge of nutrition helps in maintaining and improving the health of girls living in the hostels as the data exemplified it. Though the process of intervention wasn't able to bring about a significant change in the eating habits of girls as the small t-test has suggested, still it was successful in mildly changing how they ate.

The meals consumed by the girls at different hours contain macro and micronutrients in certain proportions. The analysis revealed that the right energy levels depend a lot on balanced meals at the right hours. Further, a t-test also revealed that the intervention wasn't able to change significantly the nutrient intake of girls, although a mild change was noticed.

Girls living in the hostels were found to be suffering from ailments and disorders as a result of lack of nutritious food as the analysis of data clearly revealed. A small t-value also suggested that there was just a mild drop in the disorders as a result of intervention.

It was found through the analysis of accumulated data that majority of hostel living girls are not able to manage their weight as a result of uncontrolled eating thereby justifying our hypothesis. Further, intervention just brought about a mild drop in the cases of Obesity as a small t-value has suggested. Still, an interventional program conducted to counsel the girls to bring about a change in their nutritional status enabled the girls to make the right choices regarding meals to be taken and the unhealthy meals to be avoided.

The study revealed quite efficiently that around 85% of the girls in the Experimental group are used to consuming junk food at least twice a week which almost indicates the lack of control and independence that they experience normally and which also leads them to consume junk with such a frequency. This could easily be correlated to the kind of digestive disorders that the girls in this group have to normally suffer. If the figures are referred, it's found that 68% girls among the Experimental group suffer obesity, 70% suffer irritable bowel syndrome and around 68% suffer anaemia. The degrees to which these disorders afflict the girls quite clearly reflect the repercussions of junk food that most of these girls in the Experimental group have to painfully bear. Also, the intervention conducted brought about a minor change in the dietary status of girls but the small t value of 0.285 indicates that the change was not significant to be noted.

It was further detected through the process of the study that majority of the girls in the Controlled group are under a constant watch of parents and as such most of them have to consume fresh and hygienic food on a regular basis. Fresh leafy vegetables, fruits and fruit juices are quite common amongst the girls of Controlled group which quite easily explains less cases of Anaemia amongst the girls in this group as compared to the Experimental group. Iron and folic acid which is present in green leafy vegetables in abundance keeps these girls free from anaemia.

The analysis of the data made it amply clear that eating outside on a regular basis doesn't come easy, it has its own set of drawbacks like around 70% of the girls from the Experimental group admitted to visiting a doctor quite a number of times in an year whereas the same isn't true for the girls from the Controlled group, they

were found to be much healthier and rarely had to visit a medical practitioner which justifies the common opinion that girls living in hostels usually have an undisciplined lifestyle which makes them quite susceptible to common ailments.

Another major inference drawn out of the study is the uniquely erratic eating pattern that most of the adolescent girls follow. Girls in the Experimental group don't have a set schedule for eating and may go for consuming anything that suits them any time of the day which in the long run hampers their health, it was found through the analysis that almost 73% of the girls in the Experimental group skip their breakfasts as compared to girls in the Controlled group where only 15% miss breakfasts which clearly reflects that they are under a better check and staying with parents keeps them on a leash.

Girls in the Experimental group are quite careless towards their supper even. It was found that a certain percentage of girls in the Experimental group miss their supper on a regular basis which they compensate for by consuming snacks at odd hours. Snacks at roadside vendors are usually cooked in hydrogenated oil and are absolutely lethal if consumed on a regular basis. Almost 65% of girls in the Experimental group are used to eating snacks that are heavily salted and high on calories and as such they are often found missing out on routine meals. This in itself is a proof enough that girls living in the hostels are more inclined towards unhealthy food which very well indicates the erratic dietary habit most of them follow as compared to girls in the Controlled group who are better monitored by their parents.

The study led us to another significant inference that majority of the girls living in the hostels consume too much of soft drinks which are high on sugar and thereby make the girls more prone to obesity. Girls in the Experimental group are usually found to be consuming aerated drinks with an utmost regularity which in the long run may prove to be detrimental as these soft drinks contain preservatives which are known to cause an almost irreparable damage to the digestive system. Around 81% of the girls in the Experimental group consume soft drinks regularly which puts them at the risk of contracting chronic indigestion and also makes them more fallible to diabetes which is not a case with the girls in the Controlled group.

The study has revealed a disturbing trend amongst the adolescents living in hostels. It's not just the unhealthy food they are consuming but the lack of healthy nutrition which they are ignoring in a routine. The best example is the lack of milk consumption among these adolescent girls. If compared with girls in the Controlled group, girls in the Experimental group hardly consume milk as a regular meal. It was found during the scrutiny of data that just around 12% girls out of the chosen sample from the Experimental group consume whole milk on a regular basis as compared to 70% girls amongst the Controlled group which deprives the girls in the Experimental group of certain important nutrients found in milk like calcium and Vitamin A that boost their immunity.

The study has further highlighted certain trends among adolescent girls which seem utmost unhealthy and the least nutritious like excessive consumption of fats and sweets. Though sugar in a regulated quantity is absolutely necessary for young girls as it gives a sudden spurt of energy which keeps them going the whole day, but the pattern of eating these girls follow gets them used to consuming sugar beyond permissible levels like majority of these girls are found habitual of cakes, chips and French fries which are high on saturated fats and sugar. Around 72% girls were found to be consuming cakes, 90% and 85% girls respectively were detected to be eating wafers and French fries which often leads them to seek frequent medical attention. Obesity, chronic digestive disorders like constipation result out of this unhealthy and sometimes unhygienic eating patterns followed by these youngsters.

Another significant inference that popped up during the course of the study concerned how much the girls exerted themselves physically. Here the girls in the Experimental group carry an edge over the girls in the Controlled group as they walk a lot and it's the only exhaustive physical activity they indulge themselves in. They can't spare much time for other physical activities like games, running and jogging. Lack of physical exertion and constantly pouring over their books makes the girls lethargic and thereby more prone to lifestyle disorders like juvenile diabetes and chronic metabolic problems. It was found that about 90% girls in the Experimental group walk about 3 to 4 times a week which is a lot

more than the number of girls in the Controlled group. Girls in the Controlled group are pampered a lot by their parents and don't get to walk much which makes them more likely to fall a victim to routine ailments.

Girls living in hostels are more active on computers and mobiles which explains why a lot of them are found to be long sighted or hypermetropic and often get to visit Ophthalmologists for routine eye tests, a problem that is found occurring less with girls in the Controlled group. Around 85% of the girls in the Experimental group admitted to wasting 4 to 5 hours playing games on laptops, chatting with friends on social networking sites accessing it either on their computers or mobiles. It's proven over the years beyond doubt that girls spending more time on computers and mobiles become lethargic and start avoiding any kind of physical exertion.

It was also significantly detected that majority of the girls in the Experimental group are on medicines. They are either found popping vitamin tablets or the herbal potions as prescribed by the doctors, which in a way proves that most of these girls living in the hostels are suffering iron, calcium or folic acid deficiencies which put them into constant problems. Around 45% of the girls in the Experimental group are found to be consuming vitamin, folic acid and calcium tablets as they lack these vital nutrients because of un-nutritious and unhealthy food that they commonly get to consume at hostels.

It was also found that most of the girls living in the hostel get to eat erratic meals which means they miss their breakfasts which should logically be the biggest source of energy. Another drawback with life in a hostel is that girls consume a lot of calories which are of course more or less equivalent to the RDA (recommended dietary Allowances) laid down by the ICMR but are more in the form of fats rather than proteins. Since most of the girls in the Experimental group skip their breakfasts and suppers, they compensate for this loss by consuming lots of snacks which are heavily salted and high on saturated fats. This is an age when proteins in excess are required and can actually work wonders for the youngster's body but excess fats are purely detrimental and are one of the major reasons behind obesity among the adolescents. Like, as against the 63gms/day proteins required as per the

RDA, these adolescents consume 38gms a day and as against 22gms/day of fats required as per the norms, these adolescents are consuming 86gms a day of fats which is too much on the scale.

Since it was an interventional program, it focused on counseling the young adolescent girls to reform their erratic pattern of eating through a three month long program which involved guidance through charts, posters and motivational sessions. It was found that there was a minor change in the fast food eating habits of girls, who might have felt influenced through the session. There was a 4% reduction in the number of girls consuming junk food which justified the efficacy of intervention.

Intervention brought about a significant change in healthy consumption habits among the hostel living girls. It was found that the number of girls consuming fresh leafy vegetables grew by over 15% after the interventional program for the sample group which proved how efficacious the counseling was. Intervention also seemed vindicated to a large extent as green leafy vegetables boost nutrients like folic acid, iron and zinc and ensure that the girls don't suffer deficiencies of these vital elements.

Intervention proved beneficial to a large extent even in motivating the girls living in the hostels to start consuming fruits and fruit juices as majority of them are either unaware of the gross advantages that could be derived out of fruits or just tend to ignore the fruits as they are inaccessible or not in vicinity. It was found that perennial fruits like bananas and seasonal fruits like oranges are usually ignored which deprives the girls of many important nutrients like vitamin A, calcium and vitamin C thereby reducing their immunity and leaving them prone to ailments. As per the data, intervention inspired the subject girls to start consuming fruits and the number of girls taking seasonal fruits grew by over 15% during the period of counseling.

There was a drastic improvement in the number of girls consuming breakfast after the intervention. Breakfast is medically known to be the most important meal of the day as it ensures a spurt of energy among the youth which keeps them going

the whole day long. Number of girls consuming breakfast grew by around 20% as a result of intervention which to certain extent proves how effective counseling turned out to be. It was found that girls tend to skip their breakfasts as staying alone gets them used to doing so. Feeling hungry early morning has to be developed as a habit which can only be done by the parents and under their constant guidance. Intervention made the girls aware about the need to have regular breakfasts to stay fit.

Intervention brought about a change in the snack eating habits of adolescents. Snacks are known to be harmful as they contain excess salt which results in erratic blood pressure which can prove to be fatal if it carries on. Further, snacks are normally cooked in hydrogenated oil at roadside vendors and outlets which further puts the youngsters at the risk of developing chronic heart ailments at a young age. It was found that there was a decline of 20% in the number of girls consuming snacks after the counseling session thereby validating the efficacy of intervention. Snacks at odd hours also kill the normal hunger that these girls may experience normally if they don't consume snacks which might further make them susceptible to ailments of sorts.

Counseling the girls was advantageous to a large extent as it was instrumental in changing their consumption patterns. It's commonly seen that adolescent girls have a special affinity towards soft drinks which have been proved harmful quite equivocally by experts across the world. Such aerated drinks contain soda which after a regular intake may cause intestinal disorders. Further the extra dose of sugar present in these soft drinks has been proven to be one of the leading causes of obesity and juvenile diabetes. Preservatives found in these soft drinks might also be one of the reasons behind the digestive ailments that soft drinks often lead to. Intervention did wonders as there was a sharp decline of 16% in the number of girls consuming soft drinks which proved the potential of counseling.

Girls living in the hostel often ignore milk as they find it tasteless and are unaware of its benefits in adolescence. Milk, as is well known, is a source of many important nutrients like vitamin A and calcium which are vital to the health of

bones and the overall well being of the adolescents. A good dose of milk in regularity keeps the youngsters fit and agile. It was found that counseling enthused the girls enough to start consuming whole milk and a sharp rise of about 13% was detected in the number of girls consuming whole milk in regularity which was quite a feat for the counsellors and the methods they used while counseling.

Intervention brought about a significant change in the number of girls consuming fats and sweets. It is common knowledge that adolescents are quite fond of chips, cakes and French fries which are a source of too much fats and excessive sugar. Majority of these youngsters are found consuming cakes and chips which may cause obesity amongst the girls and also make them prone to heart ailments. Sweets are known to cause diabetes amongst young adolescents who are prone to it genetically. It was found that around 17% of girls gave up eating chips and cakes as a result of counseling which proved that intervention was as beneficial as it was intended to be. Chips and French fries are even high on hydrogenated oil which makes the girls even more susceptible to chronic heart ailments later on in their lives.

Since most of the heart ailments are more or less related to the eating habits of these adolescents, intervention had simply aimed at bringing about a reduction in the number of adolescents falling a prey to these. Since most of the girls are not used to consuming green leafy vegetables in a routine, they are found suffering from iron deficiency which makes them anaemic. A lot of girls who are a bit overweight find it difficult to stand amongst the peers and go on a crash diet which makes them anorexic and thereby more vulnerable to chronic ailments. Further, girls even go for binge eating where they consume a lot at roadside vendors thereby putting on lots of weight. Obesity is a major problem amongst young girls and causes them lots of mental trauma and lack of confidence. Though intervention wasn't that successful in bringing about a major change in their health conditions, still there was a minor improvement in health of girls which reflected quite well in the figures that were recorded after 3 long months of counseling. There was a decline of about 5% in the number of girls suffering

anorexia, a fall of about 8% in the number of girls under the spell of anaemia and a fall of 10% in the number of obese girls after the intervention which to a great extent validated the concept of Intervention.

The study to a great extent proved to be highly effective as it revealed certain facts that otherwise would have never attracted our attention. The hypothesis that we had started off with stood validated to the best of our knowledge. The assumption that most of the hostel living adolescent girls get to eat substandard food, they lack knowledge of nutritive meals and as a result they have to suffer ailments of many kinds proved to be true as the data mirrored very well.

**SUGGESTIONS /  
RECOMMENDATIONS**

## 5.2 SUGGESTIONS / RECOMMENDATIONS

The research undertaken was pretty much exhaustive as it entailed a tedious job of zeroing on the subjects, putting them to test through questionnaires and interviews while keeping in mind the special tastes the children develop in this age, the peer pressure they have to put up with and the role food might play in their overall growth and the impact it tends to create on their lifestyle. Though getting to decide the exact impact of lack of proper nutrition on the overall quality of life they live or they aspire to live was not that easy as the sample chosen had varied choices in terms of food and belonged to backgrounds as diverse as India is known to be, still efforts were made to decide upon the best possible methods to get to know what life is all about for the girls in hostels, what they prefer eating, what they are actually offered at hostels and paying guest facilities and do what they eat really matters in shaping their lives as they wish it to be. The study threw up many complex variables quite difficult to interpret. But a detailed analysis of this data somehow enabled us to reach a conclusion which could be called acceptable though with lots of compromises. Of course, the girls were found to be floundering badly when it came to making smart healthy choices while eating, but being adolescents, such behaviour towards eating could be discounted and attributed to immaturity. Such a detailed study gave us a useful insight into the psyche such adolescents possess towards eating and also enriched us knowledgeably enough to come up with certain suggestions that could be inculcated as a habit by the youngsters and could ensure a healthy lifestyle for days to come.

1. Living in a hostel without parents is a tough experience and could lead the adolescent girls to ignore regular meals. They should make sure that they don't skip meals as it may lead to malnutrition and deficiencies.
2. Girls should specifically ensure not to miss their breakfast as it keeps them agile the whole day. Breakfast carries a special relevance as it ensures an uninterrupted flow of energy and may even help the adolescents concentrate better on their studies.

3. Maintaining good health is an issue of concern and anything untoward might perturb the health of adolescent to an irreparable degree. They should avoid fast food as much as possible as there is nothing nutritious in this junk. It just results in indigestion that could turn chronic if not taken care of timely. It could even result in constipation which is a common problem amongst youngsters today and is a result of junk diet that lacks roughage.
4. Green leafy vegetables are a rich source of important vitamins and nutrients. These vitamins enable the girls to maintain the vitality necessarily required to keep them going and help them to strengthen their immunity so much necessary to keep them away from common ailments. Girls should go for a regular diet of green salad, beans and leafy vegetables as they comprise roughage which keeps the bowels clean and thereby digestion in complete order.
5. Girls staying alone in hostels don't get to eat fruits quite often because of lack of accessibility. They should develop a habit of consuming fruits with a schedule as fruits are known to contain Vitamin C and Vitamin B12 which boost the immunity in girls.
6. Girls should avoid eating at roadside vendors as most of what they cook is in hydrogenated oil and completely devoid of hygiene. This lack of hygiene may cause them grave health problems which might turn irreversible.
7. It would also be advisable to the girls not to go for a sudden crash diet as it may prove to be physically disastrous to them. Regular meals ensure metabolism in a routine as it gives them the energy vital to keep them working. A sudden fasting may result in dizziness, nausea and an abrupt cut away from nutrients which can be detrimental to their health.
8. Girls should even maintain a schedule and consume meals as per the designed schedule which means the body should get used to consuming a balanced diet at designated hours thereby ensuring a steady growth instead of following an erratic pattern, meals at odd hours which are more harmful than useful.
9. Girls should even make sure that they take a light supper as it keeps their belly satiated for the night. These adolescents normally go for afternoon or late evening snacks which don't let them go for a proper supper later. Snacks

are known to be harmful and may cause obesity. Thus a proper supper at time keeps them away from useless calories.

10. Adolescent girls living in hostels should take care not to consume too much of soft drinks as they contain added doses of sugar which prove to be harmful in the long run. Sugar in excess is known to cause diabetes amongst the adolescents who are prone to it genetically and also leads to obesity. Most of these aerated drinks are high on soda which is known to be harmful as it leads to indigestion if consumed beyond a limit for a prolonged period of time.
11. It has always been a wise advice to these adolescents to consume milk on a regular basis. Since adolescence is a growing age, milk proves to be a boon to these youngsters as it consists of nutrients like calcium and Vitamin A which play a vital role in giving the youngster a balanced growth. Though they consume flavoured milk available in the market but the real benefit lies in consuming whole milk as it consists of all the important minerals which haven't been skimmed out. It should be developed as a habit amongst the adolescents to consume milk on a regular basis as a complete meal. It's generally seen that youngsters of today are fonder of carbonated drinks rather than a glass of milk.
12. The girls who are non-vegetarians should avoid consuming meat at road side vendors as it could be absolutely unhygienic. Meat requires a lot of hygiene while being prepared and it's only possible either at home or at big restaurants. Eating non vegetarian food at cheap outlets could be risky to a large extent as it could lead to gross infections as at such outlets it is neither washed properly nor cooked with the right measure of time, even the oil used for cooking can be considered to be of dubious standards.
13. Girls living in hostels should avoid consuming cakes, chips, candies and French fries as they are high on oil and heavily salted. Too much of salt is not at all required by human body as it leads to an uneven and abnormal blood pressure and leads to lethal results in the days to come. These adolescents are too much used to consuming salted wafers and that too almost all day long without giving a single thought to the harm it may lead to. Likewise, cakes and candies are high on sugar and may cause obesity.

14. While living in hostels and too much engrossed in studies, girls don't get much time to indulge in physical activities of any sort. This may invariably lead to getting lethargic and adolescents may develop lifestyle disorders like diabetes and blood pressure. Girls should devote a little time to walk everyday or they may even involve themselves in cycling or sporting activity of some sort. Physical activities exhaust you a lot and help the body in maintaining a hormonal balance. The excess fat that they consume also gets compensated for through any physical exercise that they involve in.
15. A time wasting activity that most girls involve in is playing games on lap tops and mobiles. They should avoid chatting on mobiles and computers as it doesn't just waste their time; it also weakens their vision and puts them to the risk of obesity. Such involvement on social networking sites makes them lazy and more prone to disorders that arise out of lack of physical activity
16. Authorities at hostels and paying guest houses should ensure that the girls get to consume fresh food that is hygienically cooked. They should make sure that girls are offered breakfast in time. It should be deemed mandatory that the lunch is cooked in proper, healthy and recommended oils instead of the unbranded shoddy ones without credentials. They should even take care not to reuse the oil once used for cooking. These measures would go a long way in ensuring good health for the youngsters.
17. Parents residing away from girls should make sure that girls are staying in a place where they get to eat hygienic food that is properly cooked. They should even see to it that girls take regular meals and avoid skipping meals. It is an age where girls are immature and develop many false perceptions about their looks under peer pressure. This leads them to skip their meals inadvertently. Parents should specifically take care that girls are aware of what they need and what is required to keep them healthy. It is the responsibility of parents to keep a tab on random roadside eating habits of girls and instead push them to go for healthy regular meals.
18. Girls should be pretty much aware about any painful development in their body as eating outside comes at a risk. Almost everything they eat away from parents has to be seen suspiciously. Any untoward development should be

visible to the girls. In case, it's a stomach ailment, the girl should immediately consult a medical practitioner instead of ignoring the problem. It will enable the girl to take proper medication in time and get over the malaise as letting the problem linger on may cost her a lot later in terms of infections, loss of appetite or some other chronic disorder.

## BIBLIOGRAPHY

## REFERENCES FROM ARTICLES AND JOURNALS

- Kotecha, Prakash.V, Karkar, Purvi and Nirupam, Siddhartha (2005), 'Adolescent girls anaemia control program'.
- A.Saibaba, M.Mohan Ram, GV Ramana Rao, Uma Devi, TS Syamala. (2002) 'Nutritional status of Adolescent girls of urban slums and impact of IEC on their Nutritional knowledge and Practices'.
- Chaubey and Chakravarty (2004-2005), 'A Comparative study of Nutrient intake in adolescent girls'.
- Kaur Tarvinder jeet, Kochar GK, Agarwal Taru, (2007), 'Impact of nutrition education on nutrient adequacy'.
- Sajjan Jyoti.T (2008) , 'Consumption pattern of green leafy vegetables and impact of nutrition education on haemoglobin status of rural adolescent girls'.
- K.Venkaiah, K.Damyanti, MU Nayak, K.Vijayraghavan, (1996-97), 'Diet and Nutritional status of rural adolescents in India'.
- K Anand, S Kant, S.K Kapoor (1998), 'Nutritional status of Adolescent school children in rural North India'.
- Ghalib J. Haboubi, Rizwana B. Shaikh, 'A comparison of nutritional status of adolescents from selected schools of South India and UAE'.
- Dr.K.Munisusmitha (2010), 'A study on the health status of adolescent girls residing in the social welfare hostels of Nellore city'.
- Bulliyya Gandham, Mallick Gitanjali, Sethy Girija Shankar, Kar Santanu Kumar, (2007), 'Haemoglobin Status of non school going adolescent girls in three districts of Orissa, India'.
- Sharma Renu Bala, Hardikar Monika, (2010), 'Effect of socioeconomic factors on physical fitness of college going girls'.
- Singla Priya, Sachdeva Rajbir, Kochhar Anita, (2012), 'Effect of nutrition counseling on junk food intake and anthropometric profile among adolescent girls of working mothers'.
- Barooah Pallavi, (2012), 'Adolescents' nutrition, attitudes and practices'.

- Mosarrof Hossain GM, Sarwar Md.Tanwir, Rahman M.Hafizur, Rouf Shaikh MA, (2013), 'A study on nutritional status of the adolescent girls at Khagrachhari district in Chittagong hill tracts, Bangladesh.
- Tiwari Priyanka, Sankhala Aarti, (2007), 'Prevalence of obesity, weight perception and dietary behavior of urban college going girls'.
- Harris Jennifer L., Bargh John A, Brownell Kelly D.(2003), 'Priming Effects of Television food advertising on eating behavior'.
- Dey I, Biswas R, Ray K, Bhattacharjee S, Chakraborty M, Pal PP, (2007), 'Nutritional status of school going adolescents in a rural block of Darjeeling'.
- Baliga Sulakshana S, Naik Vijaya A, Mallapur Maheshwar S, (2014), 'Nutritional status of adolescent girls residing in rural area: A community-based cross-sectional study'.
- Shahid A, Siddiqui FR, Bhatti MA, Ahmed M, Khan MW, (2006), 'Assessment of nutritional status of Adolescent college girls at Rawalpindi'.
- Mishra CP, Shukla KP, (2013), 'Correlates of Nutritional status of Adolescent girls in the rural areas of Varanasi'.
- Singh Sunita, Gururaj Gopalkrishna, 'Health behaviours & problems among young people in India: Cause for concern & call for action.'
- Dubey Arvind, (2010), 'Health for adolescent girls'.
- Shabnam Omidvar, Khyrunnisa Begum, (2014), 'Dietary pattern, food habits and preferences among adolescent and adult student girls from an urban area, south india'.
- Trivedi Shubha Sagar, (2012), 'Health concerns among Adolescent girls'.
- Monika, Sadia Chisty, Kanika Verma, (2011), 'Fast food consumption pattern among postgraduate female student living in hostel of University of Rajasthan, India'.
- Saxena N, Chopra N, Gupta A, (2016), 'A study on dietary intake of college going girls residing at home, hostel or as a paying guest'.

- Wasnik Vinod, Rao Sreenivas B, Rao Devkinandan, (2012), 'A study of the health status of early Adolescent girls residing in social welfare hostels of Vizianagram district of Andhra Pradesh, India',
- Clay Daniel, Vignoles Vivian L, Dittmar Helga, (2005), 'Body image and Self esteem among Adolescent girls'. Testing the influence of Socio-cultural factors'.
- Joglekar A, Verma V, Sharma G, Bhoi S, (2015), 'Prevalence of Anaemia among college going girls of Raipur City'.
- Woodruff BA, Duffield A, (2002), 'Anthropometric assessment of nutritional status in adolescent populations in Humanitarian emergencies'.
- Omobuwa O, Alabiosu CO, Adebimpe WO, (2014), 'Assessment of nutritional status of in-school adolescents in Ibadan, Nigeria'.
- Mushtaque Shah Afsheen, Memon Allah Nawaz, Laghari Arshad Hussain, et all, (2013), 'Nutritional Assessment of Hostel Residential and Non Hostel Residential boys and girl students of Sindh University, Jamshoro, Sindh, Pakistan.
- Garg Meenakshi, Rajesh Vidya, Kumar Pawan, (2014), 'Effect of Breakfast skipping on nutritional status and school performance of 10 to 16 years old children of Udipi district.'
- Popivanova Ts, Uzunova A, Mineva T, (1994), 'The impact of the hostel life style on the health status of students'.
- Hakim Abdull NH, Muniandy ND, Danish Ajau, (2012), 'Nutritional Status and eating practices among University students in selected Universities in Selangor, Malaysia'.
- Ganasegran Kurubaran, qureshi Ahmad M, Rizal AM, Aljunid Syed M, (2012), 'Social and Psychological factors affecting eating habits amongst University students in a Malaysian medical school'.
- Gilsanz Vincente, Kremer Arye, Ashley O.Mo, Kremer Richard, (2011), 'Vitamin D status and its relation to muscle mass and muscle fat in young women',

- Kotecha P.V, Patel Sangita V, Baxi R.K, Mazumdar V.S, Misra Shobha, Mehta K.G, Diwanji Mansi, Modi Ekta, (2013), 'Dietary pattern of schoolgoing adolescents in urban Baroda',
- Maiti Soumyajit, Chatterji Kaushik, Kazi Mounjar Ali, Ghosh Debidas, Paul Shyamapada, (2011), 'Assessment of Nutritional status of rural early adolescent school girls in Dantan-II block, Paschim Medinipur district, West Bengal',
- Prashant K, Shaw Chandan, (2009), 'Nutritional status of adolescent girls from an urban slum area in South India',
- Goyle Anuradha, (2009), 'A profile of families of girls studying in a government school in Jaipur City',
- Singh Sweta, Kansal Sangeeta, Kumar Alok, (2012), 'Assessment of nutritional status of adolescent girls in rural areas of district Varanasi',
- Wang Y, Popkin B, Zhaif F, (1999), 'The nutritional status and dietary pattern of Chinese adolescents',
- Gaiki Varun, Wagh Vasant, (2011), 'Nutritional status of adolescent girls from selected rural area of a district from central India',
- Dhingra Rajni, (2011), 'An assessment of health status of adolescent Gujjar tribal girls of Jammu district'.
- Musaiger A.O, (2010), 'Nutritional habits and dietary habits of adolescent girls in Oman',
- Rao D Raghunath, Vijayapushpam T, Rao GM Subba, Antony GM, (2007), 'Dietary habits and effect of two different educational tools on the nutritional knowledge of school going adolescents in Hyderabad, India'.
- Bazhan Marjan, Kalantari Naser, Houhiar-Rad Anahita, (2013), 'Dietary habits and nutrient intake of girls in Northern Iran',
- Alavi M, (2013), 'Dietary habits among adolescent girls and their association with parental educational levels',
- Sheldon Lynne (2013), ' why are adolescents experiencing a premature greying of hair',

- OECD (2002) Frascati Manual: proposed standard practice for surveys on research and experimental development, 6th edition. Retrieved 27 May 2012 from [www.oecd.org/sti/frascaticmanual](http://www.oecd.org/sti/frascaticmanual).
- J. Scott Armstrong & Tad Sperry (1994). "Business School Prestige: Research versus Teaching" (PDF). *Energy & Environment*.18 (2): 13–43.
- "The Origins of Science". *Scientific American Frontiers*.
- <sup>b</sup> <sup>c</sup> Unattributed. ""Research" in 'Dictionary' tab" Merriam Webster ([m-w.com](http://m-w.com)). *Encyclopædia Britannica*. Retrieved 13 August 2011.
- Shuttleworth, Martyn (2008). "Definition of Research". *Explorable*. *Explorable.com*. Retrieved 14 August 2011.
- Creswell, J. W. (2008). Educational Research: Planning, conducting, and evaluating quantitative and qualitative research (3rd ed.). Upper Saddle River: Pearson.
- Trochim, W.M.K, (2006). Research Methods Knowledge Base.
- Creswell, J.W. (2008). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (3rd). Upper Saddle River, NJ: Prentice Hall. 2008 ISBN 0-13-613550-1 (pages 8-9)
- Shields, Patricia and Rangarjan, N. 2013. A Playbook for Research Methods: Integrating Conceptual Frameworks and Project Management. [1]. Stillwater, OK: New Forums Press.
- Gauch, Jr., H.G. (2003). Scientific method in practice. Cambridge, UK: Cambridge University Press. 2003 ISBN 0-521-81689-0(page 3)
- Rocco, T.S., Hatcher, T., & Creswell, J.W. (2011). The handbook of scholarly writing and publishing. San Francisco, CA: John Wiley & Sons. 2011 ISBN 978-0-470-39335-2
- Questions About Freedom, Democide, And War
- Plato, & Bluck, R. S. (1962). Meno. Cambridge, UK: University Press.
- Creswell, J. W. (2008). Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. Upper Saddle River, NJ. Pearson Education, Inc.

- *Garraghan, Gilbert J. (1946). A Guide to Historical Method. New York: Fordham University Press. p. 168. ISBN 0-8371-7132-6.*
- *Sullivan P (2005-04-13). "Maurice R. Hilleman dies; created vaccines" Washington Post.*
- *Creswell, J. W. (2008). Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. Upper Saddle River, NJ. Pearson Education, Inc.*
- Data Collection Methods
- *Kara H (2012) Research and Evaluation for Busy Practitioners: A Time-Saving Guide, p.102. Bristol: The Policy Press.*
- *Kara H (2012) Research and Evaluation for Busy Practitioners: A Time-Saving Guide, p.114. Bristol: The Policy Press.*
- *Liu, Alex (2015-01-01). Structural Equation Modeling and Latent Variable Approaches. John Wiley & Sons, Inc. ISBN 9781118900772.*
- *Matusov, E., & Brobst, J. (2013). Radical experiment in dialogic pedagogy in higher education and its centaur failure: Chronotopic analysis. Hauppauge, NY: Nova Science Publishers.*
- *Kent, D. (1995). Russian psychology-I. APS Observer, March, 28-31.*
- *Kent, D. (1995). Russian psychology-II. APS Observer, May/June, 28-38.*
- *Kent, D. (1995). Russian psychology-III. APS Observer, July/August, 28-30.*
- *Schrag, Z. M. (2010). Ethical imperialism: Institutional review boards and the social sciences, 1965-2009. Baltimore: Johns Hopkins University Press.*
- Job qualifications for Leading Researcher (Russian)
- *Heiner Evanschitzky, Carsten Baumgarth, Raymond Hubbard and J. Scott Armstrong (2006). "Replication Research in Marketing Revisited: A Note on a Disturbing Trend" (PDF).*
- *J. Scott Armstrong & Peer Soelberg (1968). "On the Interpretation of Factor Analysis"(PDF). Psychological Bulletin. 70: 361–364. doi:10.1037/h0026434.*

- *J. Scott Armstrong & Robert Fildes (2006). "Monetary Incentives in Mail Surveys"(PDF). International Journal of Forecasting.*
- *"NIH Reporter".*
- *"What is Original Research? Original research is considered a primary source.". Thomas G. Carpenter Library, University of North Florida. Archived from the original on 2011-07-09. Retrieved 9 Aug 2014.*
- *Schaum's Quick Guide to Writing Great Research Papers - Laurie Rozakis*
- *Singh, Michael; Li, Bingyi (October 6, 2009). "Early career researcher originality: Engaging Richard Florida's international competition for creative workers"(PDF). Centre for Educational Research, University of Western Sydney. p. 2. Archived from the original on January 11, 2012.*
- *Callaham, Michael; Wears, Robert; Weber, Ellen L. (2002). "Journal Prestige, Publication Bias, and Other Characteristics Associated With Citation of Published Studies in Peer-Reviewed Journals". JAMA. doi:10.1001/jama.287.21.2847.*
- *Occupational Outlook Handbook, 2006-2007 edition - The United States Department of Labor*
- *Lesage, Dieter (Spring 2009). "Who's Afraid of Artistic Research? On measuring artistic research output" (PDF). Art&Research - A Journal of Ideas, Contexts and Methods. 2 (2). ISSN 1752-6388. Retrieved 14 August 2011.*
- *Eisner, E. W. (1981). "On the Differences between Scientific and Artistic Approaches to Qualitative Research". Educational Researcher. 10 (4): 5–9. doi:10.2307/1175121.*
- *Unattributed. "Artistic research at DOCH". Dans och Cirkushögskolan (website). Retrieved 14 August 2011.*
- *Schwab, M. (2009). Draft Proposal. Journal for Artistic Research. Bern University of the Arts.*
- *Schiesser, G. (2015). What is at stake – Qu'est ce que l'enjeu? Paradoxes – Problematics – Perspectives in Artistic Research Today, in: Arts,*

Research, Innovation and Society. Eds. Gerald Bast, Elias G. Carayannis  
[= ARIS, Vol. 1]. Wien/New York: Springer 2015, pp. 197-210.

- Topal, H. (2014) *Whose Terms? A Glossary for Social Practice: RESEARCH*
- Hoffman A (2003) *Research for Writers*, pp 4-5. London: A&C Black Publishers Limited.
- Swiss Science and Technology Research Council (2011), *Research Funding in the Arts* [accessed Feb 3, 2014]
- Borgdorff, Henk (2012), *The Conflict of the Faculties. Perspectives on Artistic Research and Academia* (Chapter 11: The Case of the Journal for Artistic Research), Leiden: Leiden University Press.
- Schwab, Michael, and Borgdorff, Henk, eds. (2014), *The Exposition of Artistic Research: Publishing Art in Academia*, Leiden: Leiden University Press.
- Wilson, Nick and van Ruiten, Schelte / ELIA, eds. (2013), *SHARE Handbook for Artistic Research Education*, Amsterdam: Valand Academy, p. 249.
- Hughes, Rolf: "Leap into Another Kind: International Developments in Artistic Research," in Swedish Research Council, ed. (2013), *Artistic Research Then and Now: 2004–2013, Yearbook of AR&D 2013*, Stockholm: Swedish Research Council.
- Leavy, Patricia (2015). *Methods Meets Art (2nd ed.)*. New York: Guilford. ISBN 9781462519446.

## REFERENCES FROM BOOKS

- Gopalan.C.B.V.shastri and S.C.Balasubramanian.1989.Nutritive Value of Indian Foods. Indian Council of Medical Research, Hydrabad: National institute of Nutrition.
- Gafoorunossa and K. Krishnaswamy. 2002 Diet and Heart disease. Hydrabad: National institute of Nutrition.
- Ahmed,Farunk, Momtaz Zareen, Moudadar Karn, Banu Rehman, Pervin Cadi, Mohamad Haq, Jadson Nazmul and A. Alan.1998. “Dietary Pattern, nutrient intake and growth of adolescent school girls in urban Bangladesh.” Public Health nutrition.
- Tarvinder Jeet Kaur, G.K.Kochar and Tanu Agarwal. 2007. “Impact of Nutrition Education On Nutrition adequacy of Adolescent Girls.”
- B.Shrilakshmi. Dietatics. New Age International Publishers.
- Sumati R. Mudambi, M.V.Rajagopal. Fundamentals of foods, Nutrition and Diet therapy New Age International Publishers.
- Mary Story and Michael D. Resnick. Adolescent’ view on Food and Nutrition-a Study.
- Pallavi Barooah 2012. “Adolescent’ Nutrition, Attitudes and Practices.
- ICMR.1999. Recommended dietary intake for Indians. Indian Council of Medical Research, New Delhi
- Jelliffe D B 1966. The Assessment of Nutrition of the community.World Health Organisation Monograph series No.53, Geneva.
- **Arora .R.K (2006)Meals and Health Care(96-104)**
- Jenifer L. Harris, John A. bargh,and Kelly D. Brownell (2009) health psychology vol. 28 ,no. 4,404-413
- Joshi.A Shubhangini (2010) Nutrition and Dietetics
- **Sharma Nirja;(2006)Nutrition and Nutrition status (128-138)**
- Srilakshmi. B (april1999) DIETETICS, New age international (p) limited, publishers New Delhi.
- Ballentine R. (1989) *Diet and Nutrition: A Holistic Approach*, Himalyan Press.

- Batmanghelidj F. (2000) *Your Bodys Many Cries for Water*, Tagman Press.
- Boik J. (1996) *Cancer and Natural Medicine: A Basic Text Book of Basic Science and Clinical Research*, Oregon Medical Press.
- Boyd-Eaton S. et al (1989) *The Stone Age Health Programme: Diet and Exercise as Nature Intended*. Angus and Robertson.
- Brody J. E., (October 1990) *Chinas Block Buster Diet Study*, The Saturday Evening Post.
- Budd M. (1981) *Low Blood Sugar*, Thorsons.
- Champion K. (1985) *Handbook of Herbal Health*, Sphere.
- Carper J. (2000) *Food Your Miracle Medicine*, Pocket Books.
- Chaitow L. (1987) *Stone Age Diet*, Macdonald Optima.
- Cheraskin E. et al (1977) *Diet and Disease*. Keats.
- Cooper C. (1987) *Living with Stress*, Penguin Books.
- Culton S. (1991) *The Psychology of Stress and Nutrition*, National Book Company.
- Davies S., Stewart A. (1987) *Nutritional Medicine*, Pan Books.
- Diamond H., Diamond M. (2004) *Fit for Life*, Bantam.
- *Diet and Health: Implications for Reducing Chronic Disease Risk* (1992) National Academy Press.
- *Diet, Nutrition and Cancer*, (1982) National Academy Press.
- *Diet, Nutrition and Prevention of Chronic Diseases*, Report of World Health Organisation Study Group (1990).
- Doyle W. (1994) *Teach Yourself Healthy Eating*, Hodder and Stoughton.
- Feingold B. (1975) *Why Your Child is Hyperactive*, Random House, New York.
- Geary A. (2001) *The Food and Mood Handbook*, Thorsons.
- Greenberg J. (1999) *Comprehensive Stress Management*, McGraw-Hill.

- Hambly K., Muir A., (1997) *Stress Management in Primary Care*, Butterworth Heinemann.
- Holford P. (1996) *Mental Health: Nutrition Connection*, ION Press.
- Horne R. (1989) *Health Revolution, Happy Landings*.
- Horne R. (1996) *Cancer Proof Your Body*, Angus Robertson.
- James O. (1998) *Britain on the Couch*, Arrow.
- James W.P.T. (1988) *Healthy Nutrition: Preventing Nutrition Related Diseases in Europe*. WHO Regional Publications.
- Junsji C., Collin-Campbell T., Junyao C., Peto R. (1993) *Diet, Lifestyle and Mortality in China*, Oxford University Press.
- Lazarides L. (1996) *Principles of Nutritional Therapy*, Harper Collins.
- Leeds A., Judd P., Lewis B., (1990) *Nutrition Matters for Practice Nurses: A Handbook of Dietary Advice for use in the Community*. John Libbey.
- Leverkus C. et al (1985) *The Great British Diet*, The British Dietetic Association.
- Macgregor G.A., deWardener H.E., (1998) *Salt, Diet and Health*. Cambridge University Press.
- McKarness R. (1976) *Not all in the Mind*, Pan.
- *Medical Aspects of Dietary Fibre: A Report of the Royal College of Physicians*, Pitman Medical (1980)
- Mount J.L. (1975) *The Food and Health of Western Man*, Charles Knight and Co. Ltd.
- Norfolk D. (1986) *Executive Stress*, Arrow.
- Ornish D. (1984) *Stress, Diet and Your Heart*, Signet Books.
- Parker L.T. (1997) *Success over Stress*, Hartman Publishing inc.
- Plant J., Tidy G. (2002) *The Plant Programme: Recipes for Fighting Breast Cancer*, Virgin Books.
- Pritikin R. (1991) *The New Pritikin Program*, Pocket Books.
- Quillin P. (1989) *Healing Nutrients*. Vintage Books.

- Somer E. (1999) *Food and Mood*, Henry Holt.
- Spiller G.A. (1991) *The Mediterranean Diet in Health and Disease*, Avi Books.
- Stewart-Truswell A. (1993) *ABC of Nutrition*, British Medical Journal Books.
- *Stress Management Training*: The Stress Consultancy, Sheffield, Yorkshire
- Temple N.J., Burkitt D.P. (1994) *Western Diseases: Their Dietary Prevention and Reversibility*, Humana Press.
- Terras S. (1994) *Stress, How Your Diet can Help: The Practical Guide to Positive Health Using Diet, Vitamins, Minerals, Herbs and Amino Acids*, Thorsons.
- Trickett S. (1997) *Coping with Anxiety and Depression*, Sheldon Press
- Werbach M.R. (1989) *Nutritional Influences on Illness: A Source Book of Clinical Research*, Thorsons.
- Werbach M.R. (1999) *Nutrition Influences on Mental Illness*, Third Line Press.
- Wilson E., Lewith G. (1997) *Natural Born Healers*, Channel 4 Books.
- Wurtman J. (1988) *Managing Your Mind and Mood Through Food*, Grafton Books.
- Wurtman J.J. (1997) *The Serotonin Solution*, Fawcett Columbine, New York.
- Paton A (ed) (1994) *ABC of Alcohol* BMJ Books.
- Snowden L, Humphreys (1991) *The Walking Diet*, Mainstream Publishing.
- *Eating for your Heart* British Heart Foundation booklet
- <http://www.bhf.org.uk/publications/uploaded/download-his5.pdf>
- *Managing Stress, Healthy Eating Module* (2000) The University of Greenwich.
- Stephens A. The Daily Mirror, 12/2/04.



# APPENDIX

**Annexure-A**

**AN EDUCATIONAL INTERVENTION TO STUDY NUTRITIONAL  
STATUS AND DIETARY PATTERN OF GIRLS RESIDING IN HOSTEL  
FOR COACHING**

***(WITH SPECIAL REFERENCE TO KOTA CITY)***

**Instructions-**

1. Information provided by you will be used for research purpose only and not for other else.
2. Please give correct answers of all the questions. Impartial information given by you will affect the quality of research study.

RESEARCH SUPERVISOR

Dr. Bindu Chaturvedi

RESEARCH SCHOLAR

MS. Anjali Saxena

### **Basic Information**

Please fill the following information (कृपया निम्न सूचनायें देवें):-

Name (नाम).....

Age (आयु)..... Sex (लिंग): Male/ Female .....

Date of Birth (जन्म तिथि).....Birth Order.....

Religion.....

Educational Level ( शैक्षिक योग्यता) - 10<sup>th</sup> /12<sup>th</sup> /Graduation/Post  
graduation/Professional

No. of Siblings (भाई बहन की संख्या).....Type of Family.....

Father's Name (पिता का नाम).....Occupation (व्यवसाय).....

Mother's Name (माता का नाम).....Occupation (व्यवसाय).....

Family Income (पारिवारिक आय).....

Permanent Address (स्थायीपता) .....

.....

Residential Address (निवास).....

.....

Phone No (फोन न.).....Mo. No (मोबाईल न.).....

Name of Hostel (होस्टल का नाम).....

Air Conditioner .....Non Air Conditioner.....

Name of Coaching Institute (इंस्टिट्यूट का नाम).....

**Specific Information (विशेष सूचना)**

Anthropometric-Weight (वजन)... ..Kgs. Height (उचाई)... Inches BMI .....

MUAC\* .....inches

TSFT\*\* .....inches

Blood Group.....Anemic---Y/Hemoglobin (Hb).....

Skin Color.....Eye Color.....

Health Problem due to lack of nutrition if any related to Skin, Hair, Backache,  
Eyes.....

Other information if any.....

MUAC\*-Mid upper Arm Circumference TSFT\*\*-Triceps Fold Thickness

## Annexure-A

### Nutrition Questionnaire Regarding Food habit and Eating Behaviors

- (a) Name \_\_\_\_\_
- (b) Age \_\_\_\_\_ Mo.No. \_\_\_\_\_
- (c) Type of Hostel (AC/ Non AC) \_\_\_\_\_
- (d) Have you seen a nutritionist before \_\_\_\_ Yes \_\_\_\_ No
- (e) if so, who and when \_\_\_\_\_

1. Why do you want to see a nutritionist?

- Anemia
- High Blood Pressure
- Want to gain weight
- Diabetes
- High Cholesterol
- Want to lose Weight
- Irritable Bowel Syndrome
- General healthy eating advice
- Other

2. Medical History

Please check the correct response below.

Are you currently being treated for a medical condition \_\_\_\_ Yes  
\_\_\_\_ No \_\_\_\_ Not sure if yes explain \_\_\_\_\_

Are you taking any medications? \_\_\_\_ Yes \_\_\_\_ No \_\_\_\_ Not sure If  
yes, list: \_\_\_\_\_

Do you have a family history of diabetes? \_\_\_\_ Yes \_\_\_\_ No \_\_\_\_ Not sure if  
yes, explain \_\_\_\_\_

Do you have any family history of high cholesterol? \_\_\_\_ Yes  
\_\_\_\_ No \_\_\_\_ Not sure If yes  
explain \_\_\_\_\_

Do you have any family history of high blood Pressure? \_\_\_\_ Yes  
 \_\_\_\_ No \_\_\_\_ Not sure If yes explain \_\_\_\_\_

3. How often you do self-cooking? 1. Daily  2. Weekly  3. Rarely  4. Never

4. When cooking with ghee/oil, what ghee/oil(s) do you typically use?

- Rice Bran  Corn  Vegetable  Sunflower  Olive  Margarine  Butter  Safflower  
 Soya  Coconut  Peanut  Don't know  Don't cook with oil

5. Which of the following best describes your eating pattern?

- I keep track of calories eaten at each meal/ I know my exact calorie intake for the day.  
 I have a general idea about the number of calories eaten at each meal/ I know roughly how Many calories consume in a day.  
 I do not keep track of calories eaten at meals/ I am not sure how many calories I am Consuming in a day.

6. Which of these meals or snacks did you eat?

Meals	Daily	Weekly	Rarely	Never
Breakfast				
Lunch				
Dinner or supper				
Morning snack				
Afternoon snack				
Evening/late-night snack				

7. Do you eat or take out a meal from a fast-food restaurant?

1. Daily  2. weekly  3. Rarely  4. Never

8. Are you on a special diet for medical reasons?  Yes  No

9. Which of the following did you drink?

<b>Drink</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Tap or bottled water				
Fitness water				
Juice				
Regular soft drinks				
Diet soft drinks				
Fruit-flavoured drinks				
Sports drinks				
Energy drinks				
Recovery drinks				
Fat-free (skim) milk				
Low-fat (1%) milk				
Reduced-fat (2%) milk				
Whole milk				
Flavoured milk (for example, chocolate, strawberry)				
Coffee or tea				
Beer, wine, or hard liquor				

10. Which of these foods did you eat?

<b>Grains</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Bagels				
Bread				
Cereal or grits				
Crackers				
Muffins				
Noodles, pasta, or rice				
Rolls				
Tortillas				

Other grains: \_\_\_\_\_

**Vegetables**

<b>Vegetables</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Broccoli				
Carrots				
Corn				
Green beans				
Green salad				
Green leafy vegetables				
Peas				
Potatoes				
Tomatoes				

Other vegetables: \_\_\_\_\_

**Fruits**

<b>Fruits</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Apples or apple juice				
Bananas				
Grapefruits or grapefruit juice				
Grapes or grape juice				
Melon				
Oranges or orange juice				
Peaches				
Pears				

Other fruits or other fruit juice: \_\_\_\_\_

**Milk and Milk Products**

<b>Milk and Milk Products</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Fat-free (skim) milk				
Low-fat (1%) milk				
Reduced-fat (2%) milk				
Whole milk				
Flavoured milk				
Cheese				
Ice cream				
Yogurt				
Tofu				

Other milk and milk products: \_\_\_\_\_

**Meat and Meat Alternatives**

<b>Meat and Meat Alternatives</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Beef or hamburger				
Chicken				
Cold cuts/deli meats				
Dried beans (for example, black beans, kidney beans, pinto beans)				
Eggs				
Fish				
Peanut butter or nuts				
Pork				
Sausage or bacon				
Turkey				

Other meat and meat alternatives: \_\_\_\_\_

**Fats and Sweets**

<b>Fats and Sweets</b>	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Cake or cupcake				
Candy				
Chips				
French fries				
Cookies				
Doughnuts				
Fruit-flavoured drinks				
Pie				
Soft drinks				

Other fats and sweets: \_\_\_\_\_

11. Do you eat, drink or take anything to build muscle or increase your weight?

1. Daily  2. weekly  3. Rarely  4. Never

If so, what brand or type? \_\_\_\_\_

12. Did you participate in physical activity (for example, walking or riding a bike)

1. Daily  2. weekly  3. Rarely  4. Never

13. Do you spend more than 2 hours per day watching television and DVDs or playing computer games?  Yes  No If ye

14. Do you take vitamin, mineral, herbal, folic acid, calcium ,iron or other dietary supplements (for example, protein powders)? 1. Daily  2. weekly  3.  
Never

15. Do you smoke cigarettes or chew tobacco?  Yes  No

16. Do you ever use any of the following?

	<b>Daily</b>	<b>Weekly</b>	<b>Rarely</b>	<b>Never</b>
Alcohol, beer, or wine				
Steroids (without a doctor's permission)				
Street drugs (marijuana seed, crack, or heroin)				

## Annexure-B

### **Body Image, Disordered Eating, and Weight Management**

Client name \_\_\_\_\_

For each question, circle the answer which best describes the client's usual behaviour or feelings.

1. After eating Do you have any problems with your appetite all the time?  Yes  No
2. Without eating Do you have any problems with your appetite?  Yes  No
3. Are you happy with your body size and shape?  Yes  No
4. Are you on a diet or do you limit your food intake to lose weight  Yes  No
5. Does your mood depend on your weight (e.g., if you gain one pound you are depressed, irritable, etc.)  Yes  No
6. Do you feel bad about yourself if you gain weight?  Yes  No
7. Do you think of certain foods as being either "good" or "bad" and feel guilty about eating "bad" foods?  Yes  No
8. Do you use foods to comfort yourself?  Yes  No
9. Do you ever feel out of control when eating?  Yes  No
10. Do you spend a significant amount of time thinking about food and when you will eat?  Yes  No
11. Do you vomit or have you thought about vomiting as a way to control your weight?  Yes  No
12. Do you use laxatives, water pills, exercise, etc., to prevent weight gain?  Yes  No
13. Have you ever exercised to compensate for eating too much?  Yes  No
14. Do you try to hide how much you eat?  Yes  No
15. Do you eat until you feel stuffed?  Yes  No





## **Annexure-D**

### **Nutrition Quality of life after Educational Intervention**

During the last 2 weeks, I (Check all that apply):

- Ate enough food to be satisfied
- Had plenty of choice in the food I ate
- Was hungry between meals
- Sneaked food
- Tasted and enjoyed foods without guilt
- Took time to eat the food that was best for me
- Took time to shop and prepare the food that was best for me
- Liked the way I look
- Liked the way my clothes fit
- Beat myself up when I ate the food I felt I shouldn't have
- Took time for myself
- Was pleased with the way I managed what I ate
- Was confused about the food I should eat
- Rewarded myself with food
- Was happy about the food I ate
- Felt that food was controlling me
- Felt that changing the food I ate would make life more enjoyable for me
- Felt frustrated about limiting the food I ate
- Was angry that I had to change what and how I ate
- created stress with my family/friends over my food needs
- Was nagged by my friends/family about the food I ate
- Had someone I could talk to who understood the struggles I have had with food
- Found it difficult to stick to the food I thought I should eat while with family/friends
- Knew what type of food I should have been eating for my healthy lifestyle
- Knew the amount of food I could eat
- Made healthy food choices
- Ate the recommended amount

- Ate when I should have
- Felt confident that I could trust myself when faced with difficult food choices
- Felt confident that I would be able to live the rest of my life with these changes in my food

**DAILY FOOD RECORD**

**DAY NUMBER**

<b>TIME</b>	<b>FOOD OR BEVERAGE</b>	<b>QUANTITY EATEN</b>	<b>PLACE EATEN</b>	<b>WHO YOU ATE WITH</b>
<b>TIME</b>	<b>FOOD OR BEVERAGE</b>	<b>QUANTITY EATEN</b>	<b>PLACE EATEN</b>	<b>WHO YOU ATE WITH</b>


**Nutrients diet may be lacking in: -----**

**Nutrient diet may be excessive in: -----**

-

---

## Dying To Be Thin

### A study of Kota City Adolescent girls (age between 16 to 25)

---

Ms.Anjali Saxena\*

Research Scholar

University of Kota, Kota

Dr.Bindu Chaturvedi\*\*

Senior Lecturer,

Department of GPEM

J.D.B. Girls P.G. College, Kota

### ABSTRACT

Adolescence is up to the brim with vibrancy and is full of innovation, drive and ideas. It is a positive force for a nation and is responsible for its productivity, provided it is groomed in a healthy manner. Being a South East Asian nation and a former colony of British, India has revelled in the influence of western culture and thereby looking good and presentable holds the key to a bright future.

Indian food, over the years has been much celebrated across the world for its excessive use of oils and spices which add to the taste but have a flip side too. It has led to children gaining weight and getting obese. Obesity has its own repercussions, as it is now a major reason behind several **cardiovascular** diseases.

Being a youth exacts a heavy price. Youth symbolizes good looks, a trim physique, an adorable figure which may lead them to take steps on their own without an expert consultant guiding them to do so. Reports indicate that girls across the urban span are employing excessive measures to cut down their weights in order to be more acceptable amongst the peers. Cutting down on significant nutritional values is today one of the major causes of **Anorexia**, all the more because it's a random decision and lacks parental consent. Though it's vehemently opposed by medical experts and physicians but is trending at a rapid pace.

We had a random survey of 1050 adolescent girls chosen from a cross section of hostels in Kota where almost all girls belonged to a middle income group and were attending various Coaching Institutes of Kota. As per the standard BMI, some were underweight, a few were normal, some were overweight and the remaining were downright obese. The girls found to be obese had a low sense of self esteem when they were asked questions related to their looks. A few amongst them were found to be engaged in either a medical treatment to cure them of their problem or involved in heavy physical activity so as to shed those extra kilos. Even amongst the overweight ones, some were found to be very much aware of their undue extra mass and were involved in some or other physical exhausting activity and were even found to be trying many home made and easily available cures to go thin.

Media and its promotional campaigns have also contributed significantly in spanning a whole generation of Anorexics across the length and breadth of the nation. Youngsters are dying to be thin. It might be an impending disaster with unproductive and unfit youth contributing nothing to the nation.

**Key Words:** - Obesity, Anorexia, cardiovascular

---

## **INTRODUCTION**

Girls living in the hostels of Kota have a tough life as they have to not just deal with their studies but with the day to day problems of managing their meals. One thing is for sure, because of lack of parental guidance, much of what they eat is either unhealthy or unhygienic. Though, their hostel life gives them lots of freedom, it puts upon them an added pressure of fending for themselves when it comes to managing meals. Hostels, as it is well known, are not able to provide them the kind of nutritious food that is required for youngsters of this age to keep them growing. As a result most of these youngsters are found deficient in certain vital nutrients thereby making them vulnerable to chronic ailments. The same problem is not found with most of the adolescents staying with parents as they are pampered and well taken care of. Since most of the adolescents have to attend regular classes that are gruelling to an extent, they don't get much of a time to be aware about their routine meals. As such, they eat randomly whatever they are able to lay their hands upon which often results in digestive disorders occurring with a painful regularity.

Further, their eating habits are almost as bad as their schedules. What they eat is what they wish to, which means consuming lots of roadside food which is so common in a place like Kota where you will find vendors selling Kachoris, Bread Pakoras, Pav Bhaji, Chola Kulchas almost at every possible corner. These meals are usually deep fried in hydrogenated oil which satiates their immediate hunger and is delicious as well. Further, these meals are cooked absolutely unhygienically with least attention being paid to washing of vegetables, using proper gloves while handling food. Even the water that is used to cook is of a dubious quality, the source normally being roadside municipality taps.

Adolescence is an age when a girl gets too self conscious about her looks and that's the reason why most of young girls in this age start working upon looking good and one of the best ways available for them is to reduce their weight. Obesity is considered to be a curse amongst the youngsters especially girls and they leave no stone unturned in cutting down their weight which often leads to absolutely harmful results, common amongst them is Anorexia Nervosa which is a disorder where an individual loses so much of weight that it becomes difficult for her to sustain a normal life. The present study took 1050 adolescent girls from different hostels of Kota as subjects as the scourge of Anorexia afflicts adolescents the most. The subjects were chosen randomly with no fixed criterion employed for their selection. This might have skewed the result a bit this way or other, but then the study threw up a set of conclusions which could be considered the most enlightening.

The best thing about the study was that almost all adolescent girls who were interviewed were living in hostels which exposed them to almost similar conditions which has made the result uniform, justified and worth noticing. Well, it had a flip side too, the study couldn't take into consideration girls living with parents and thereby under constant supervision as to a large extent their meals could be considered to be regulated and influenced by parents.

## **OBJECTIVES**

The study required a few objectives to be conducted smoothly as objectives normally give us a destination to proceed. While collecting the data, objectives have to be there as it helps us to deduce the results quite effectively which otherwise would be very difficult. Further, objectives also help us to match our desired progress with the actual results and conclusions. In case of any rectification, the objectives can be referred to. All in all objectives don't allow us to lose our track. Each objective builds up the need to work upon the next one as usually the objectives are

decided in an order of decreasing significance. The objectives that we have come to decide are as given below and may help us in propelling forward:

1. To assess the number of girls out of the chosen sample skipping their meals.
2. To find out the number of girls consuming green leafy vegetables on a regular basis.
3. To study and assess the number of girls from the chosen sample consuming fruits and fruit juices.
4. To figure out the number of girls consuming milk in a routine.
5. To assess the number of anorexic girls visiting medical practitioners as they wish to gain weight.

## **MATERIALS AND METHODS**

### **A. Selection of subjects**

The study was focused on the adolescent girls living in the hostels of Kota. Around 1050 girls were selected randomly without any predefined criterion as it was not possible to decide a basis as it would have been a difficult task. The girls were chosen from different hostels and even the hostels were selected arbitrarily depending on which hostel was ready to provide a friendly entry. The problem arose because of the fact that taking an entry into a girls' hostel is severely restricted in certain areas of Kota and thereby the subjects had to be selected randomly without much of a choice. Most of the girls belonged to middle income group and thus the possibility of all the girls having more or less similar eating habits was pretty large. Also, since all of them are from the same age group, the habits can again be construed to be the same in terms of eating preferences and also in terms of skipping meals.

### **B. Questionnaire**

The girls were subjected to a questionnaire which contained questions seeking answers about all the aspects of the girl's life. Answers were sought regarding their dietary habits, their vegetarian or non-vegetarian status, their family backgrounds, region to which they actually belonged and also the kind of food that they normally get to eat while being with their families. Questions were also intended to seek information regarding the awareness they possessed about the importance of nutrition and meals that can be considered healthy. The questions sought answers regarding their special food preferences, how many times in a week they actually preferred eating green leafy vegetables and how many times they tried fruits and fruit juices. This information made it amply clear as to what the adolescents love eating while away from parental guidance. It also helped us in assessing what they missed in terms of nutrients and what all food stuff that's unhealthy is being consumed by these adolescents on a routine basis.

Further, there was a secondary questionnaire too that employed the 24 hour recall method to assess what the adolescents ate round the clock. The questions were designed in such a manner so as to gain even the smallest every minute detail about what they ate and what prompted them to go for that. This 24 hour recall method was decided to gain vital information into the frequency with which they skipped their meals especially the breakfast which is supposed to be the most important meal of the day. Furthermore, it also contained questions seeking answers regarding their visits to restaurants and what they preferred while at the eating outlets. Which also means, if they were skipping a meal, how they compensated for that? It all carried relevance as the data we were wishing to collect depended a lot on that. Though, seeking such information from adolescents was a tough job as they were a bit reluctant in sharing all that.

## **DIETARY PATTERNS**

Adolescence is an age when looks matter a lot. Girls between the age of 16 to 25 are the most bothered about their looks as what influences them the most, are the people in the film and the fashion industry. Being obese today is something that invites taunts and insults. Especially when it comes to girls, looking trim and well shaped is a dream almost all girls visualize and wish this dream to come true. This results in a crash diet. It is commonly found that young girls in hostels compete with their friends in looking thin and attractive. They start avoiding regular meals which deprives them of vital nutrients that are responsible for keeping the body healthy and properly immuned and this makes them vulnerable to common ailments and even a few deadly ones.

Skipping routine meals is a norm. Girls think that by not eating a particular meal, they will be able to cut down their weight which to a certain extent doesn't stand true. Rather than losing weight, they miss out on vital nutrients that are responsible for keeping them fit. Nutrients that can be gained by consuming timely glass of milk, green leafy vegetables, and regular breakfasts can't be replaced by any other substitutes. Normally missing their breakfasts deprives them of active Carbohydrates that are an instantaneous source of energy and keep the girls agile and fit the whole day. Missing their breakfasts for a prolonged period of time makes them gradually prone to ailments of many sorts. Further, a lot many girls living in the hostels even miss their suppers and substitute them with something downright unhealthy like snacks, French fries or some of them develop a habit of staying hungry which gradually aggravates with time and the girls start suffering from Anorexia Nervosa which is more a life style disorder rather than a disease of sort.

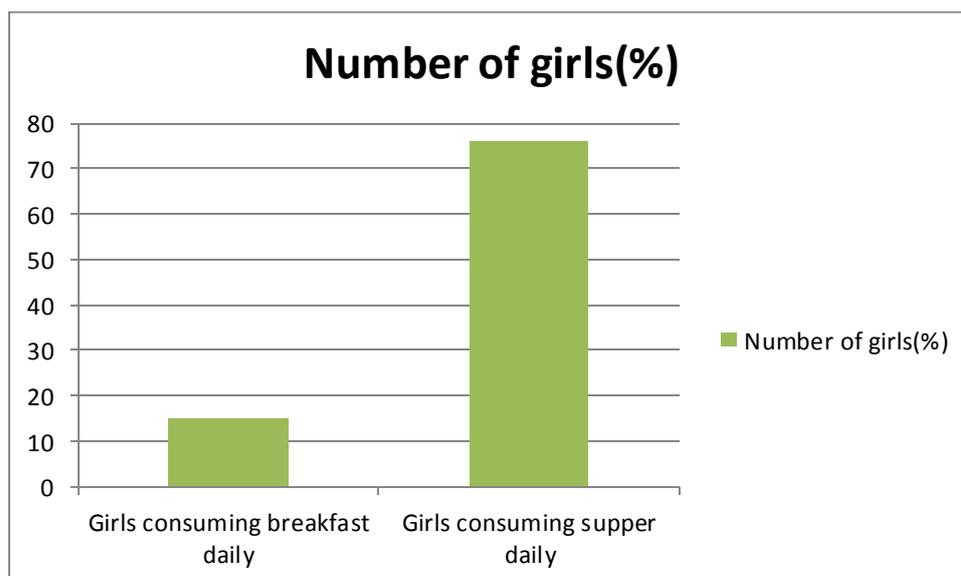
Further, as discussed earlier, parents are not there and so nobody asks them to go for a regular glass of milk which consists of calcium, a vital mineral that strengthens their bones and this weakens their immunity over a period of time. Regular meals don't just keep you satiated and fit, they also ensure that the metabolism of the body remains in order thereby giving them an uninterrupted flow of energy which enables them to concentrate on their studies and perform their obligations efficiently.

Moreover, their dietary intake also lacks fruits and their juices as a result of lack of accessibility thereby depriving them of significant vitamins that could boost their immunity and ensure prevention against viral fevers and infections of all sorts.

## **ANALYSIS OF DATA**

1. The data accumulated through the questionnaires was tabled methodically to be analysed later. The questions were quite direct and sought information on the breakfast and supper habits of girls living in the hostels. Most of the girls are careless as a result of extra independence and don't care to have their breakfasts in time which is considered to be the most important meal of the day. The data given below quite explicitly clarifies the attitude of girls towards breakfast.

Category	Number of girls(%)
Girls consuming breakfast daily	15
Girls consuming supper daily	76



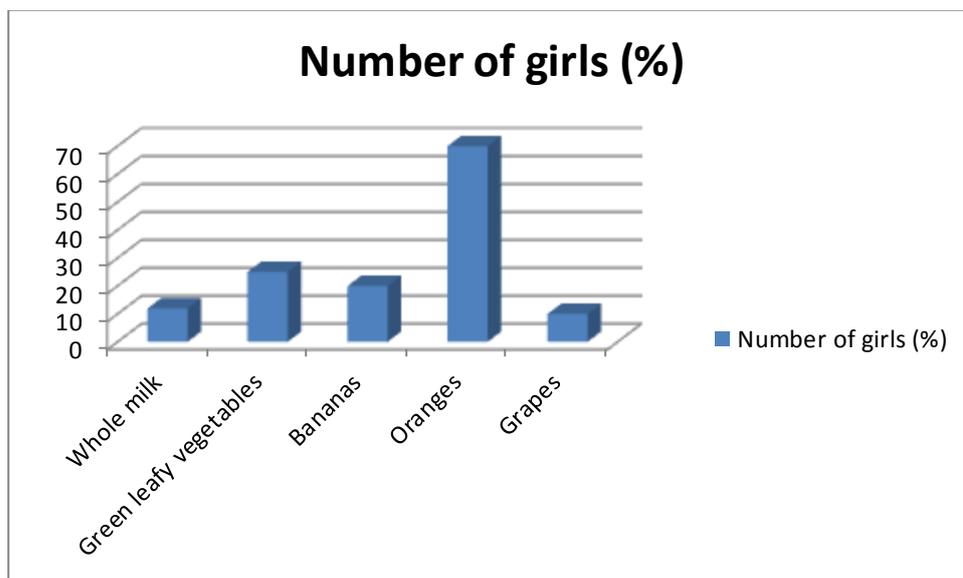
As the bar diagram plotted above clearly states that just 15% of the girls living in the hostels are used to consuming breakfast daily which means 85% of the girls are skipping their breakfasts thereby staying hungry the whole day till noon which has an adverse effect on their fragile health. Breakfast is the most energetic meal of the day as it consists of lots of carbohydrates which give an immediate boost of energy. Same is the case with supper. Only 76% girls in the hostels are found to be consuming supper on a regular basis which means around 24% of the girls skip their supper which again keeps them hungry the whole night. Every meal is a blend of nutrients and any meal skipped takes its toll on the body.

- It was also found during the analysis of data that lots of girls living in the hostels are not interested at all in consuming milk which in itself is a whole meal and is considered to be the healthiest possible meal for youngsters in a growing age. Milk consists of calcium and vitamin A which are nutrients that are vital to the overall enhancement of immunity and also good for the growth and strengthening of bones.

Further, girls living in hostels are found skipping the consumption of green leafy vegetables which are a vital source of folic acid and iron which ensure over a period of time that girls don't become anaemic. Also, fruits and fruit juices are usually ignored by these adolescent girls either as a result of carelessness or also because of the reason that fruits are not easily accessible where they live in hostels.

Fruits are a rich source of vitamins, like all the citrus fruits are known to be an endless source of vitamin C that does the job of maintaining the immunity which prevents the body from contracting any ailment or disorder. The data accumulated regarding consumption of meal was tabled below for a methodical assessment.

Category (twice a week)	Number of girls (%)
Whole milk	12
Green leafy vegetables	25
Bananas	20
Oranges	70
Grapes	10



As the bar diagram plotted above quite convincingly shows that girls living in the hostels miss vital food choices that play a big role in keeping them healthy and free from ailments. These adolescents have a great sense of self esteem which to a large extent is associated with their looks and that prompts them to skip meals, milk and other foods vital to the balanced growth of their body. Like, as the graph suggests fruit like orange which is a citrus fruit is rich in vitamin C which consolidates the immunity and could keep the adolescents free from common ailments, is consumed quite less despite its widespread availability. Similarly whole milk is casually ignored and almost not consumed though for adolescents milk should be something regular on their menu.

3. Out of the 1050 girls living in the hostels chosen as subjects, around 68% were found to be visiting doctors so as to cure themselves of Anorexia. Skipping meals so as to shed extra kilos makes them lose even the basic minimum weight that girls of their age should possess. It leads to an advanced stage of Anorexia, where they start suffering its manifestations in the form of dizziness and anaemia.

### NUTRIENT INTAKE

As the data tabled above and the graph plotted thereafter clearly depicts that majority of the girls living in the hostels don't consume their regular meals as a result of peer pressure. The pressure of looking good weighs heavily upon them and it makes them cut down their regular dietary intake in order to reduce weight. This deprives them of several vital nutrients which keep the body healthy. Like milk is a significant food which most of the girls skip as they assume milk to be consisting of fats which may result in weight gain. Whereas, milk is a vital source of calcium which is responsible for the health of bones. Further, milk is also known to be an important source of vitamin A which keeps eye ailments at bay. Most of the eye disorders found in adolescents are a result of deficiency of vitamin A. Moreover, vitamin A is also known to be one of the many factors that manage the health of skin. Thus, cutting down upon the intake of milk costs the girls heavily.

Weight reduction seems to be an obsession among the girls in adolescence. They are such dedicated to losing their weight that even the most vital meals get ignored, like these

---

adolescents are found to be skipping green leafy vegetables as they commonly miss their meals. Green leafy vegetables are known to contain folic acid and iron both of which are medically proven to be responsible for the density of RBCs and thus most of the hostel living girls are found to be anaemic. Since a big chunk of our supper and lunch consists of leafy vegetables, thus skipping a meal keeps a girl deprived of iron and folic acid. Green leafy vegetables contain enough roughage which helps in keeping the bowels clean. Girls need to keep their digestion in order as it also enhances metabolism and thereby a quick release of energy.

Girls living in hostels also avoid consuming fruits and fruit juices which are known to be a rich source of vitamin C and vitamin A. As is medically known, vitamin C is found in all the citrus fruits and is responsible for boosting the immunity of girls. An adequate quantity of vitamin C keeps the girls free from bodily ailments like seasonal fevers and water borne and airborne diseases.

## **CONCLUSION**

The study threw up certain facts that justified the objectives and the authenticity of choosing them. The research found that a large number of adolescent girls living in the hostels are under a severe peer pressure to look good which motivates them to start skipping their meals which leads to a sudden loss of weight and may even make these adolescents suffer from Anorexia.

It was found that most of these hostel living adolescent girls miss green leafy vegetables in their diets which gradually causes them to become deficient in important nutrients like iron and folic acid which are vital in sustaining RBCs and thereby prevent the girls from becoming anaemic.

The research also stumbled upon the fact that most of these adolescent girls are not fond of milk or even if they are, they gradually become casual towards the regular consumption of milk which makes them deficient in calcium which is known to strengthen bones. Further, Milk is also a good source of vitamin A, a deficiency of which makes the girls suffer eye ailments and weakening of vision.

Moreover, adolescent girls living in the hostels are not used to consuming fruits as either they are not easily accessible or they get careless about consuming fruits. Fruits are a rich source of vitamins and nutrients, like citrus fruits are known to contain vitamin C which boosts immunity. Bananas are known to consist of calcium and starch which are instant energy boosters. Girls missing fruits gradually get to suffer a loss in their immunity and get more prone to diseases.

It was assessed that a lot of girls living in the hostels get to visit doctors with the problem of Anorexia, which means some of them suffer such sudden weight losses that it becomes almost mandatory for them to consult medical practitioners for immediate remedies.

## **RECOMMENDATIONS**

1. It is always advisable to the girls not to go for crash diets to suddenly lose weight. If they really wish to shed down extra kilos, it's always beneficial to alter their diet plans under the supervision of some consultant rather than taking their own decisions.
2. Milk is an important part of adolescents' diet as it contains significant nutrients which are known to strengthen bodily framework. Milk is a meal in itself and helps adolescents in this growing age.
3. Adolescents should make it a point to include green leafy vegetables which consist of roughage that is important in keeping the digestion in order by keeping the bowels clean. Further, leafy vegetables are a rich source of iron.

4. Fruits are a vital part of our meal system and consist of vitamins which boost the immunity of adolescents thereby keeping them free from ailments. Fruits are also easy to digest and thereby enable the body in speeding up metabolism as a whole.

## References

1. Sukhneet Suri and Anita Malhotra(2012) Pearson Pvt.Pubilcation,Delhi
2. New York Times(Sep 2012), WHO Report
3. British Journal (2013) Lighterlife Publication
4. N.Shakuntla Maney
5. The Hindu (Sep 2013)
6. Famina(Sep 2014)
7. American Diabetes Association
8. American Academy of Opthamology and American Optometric Association
9. International Journal of Scientific Research, Jan 2012
- 10.American Journal of Life Sciences March 2012
11. Gopalan.C.B.V.shastri and S.C.Balasubramanian.1989.Nutritive Value of Indian Foods. Indian Council of Medical Research, Hydrabad: National institute of Nutrition.
12. Gafoorunossa and K. Krishnaswamy. 2002 Diet and Heart disease. Hydrabad: National institute of Nutrition.
13. Ahmed,Farunk, Momtaz Zareen, Moudadar Karn, Banu Rehman, Pervin Cadi, Mohamad Haq, Jadson Nazmul and A. Alan.1998. "Dietary Pattern, nutrient intake and growth of adolescent school girls in urban Bangladesh." Public Health nutrition.
14. Tarvinder Jeet Kaur, G.K.Kochar and Tanu Agarwal. 2007. "Impact of Nutrition Education On Nutrition adequacy of Adolescent Girls."
15. B.Shrilakshmi. Dietetics. New Age International Publishers.
16. Sumati R. Mudambi, M.V.Rajagopal. Fundamentals of foods, Nutrition and Diet therapy New Age International Publishers.
17. Mary Story and Michael D. Resnick. Adolescent' view on Food and Nutrition-a Study.
18. Pallavi Barooah 2012. "Adolescent' Nutrition, Attitudes and Practices.
19. ICMR.1999. Recommended dietary intake for Indians. Indian Council of Medical Research, New Delhi
20. Jelliffe D B 1966. The Assessment of Nutrition of the community.World Health Organisation Monograph series No.53, Geneva.
21. **Arora .R.K (2006)Meals and Health Care(96-104)**
22. Jenifer L. Harris, John A. bargh,and Kelly D. Brownell (2009) health psychology vol. 28 ,no. 4,404-413
23. Joshi.A Shubhangini (2010) Nutrition and Dietetics
24. **Sharma Nirja;(2006)Nutrition and Nutrition status (128-138)**
25. Srilakshmi. B (april1999) DIETETICS, New age international (p) limited, publishers New Delhi.



## A STUDY TO ASSESS THE DIETARY HABITS THAT LEAD TO OBESITY AMONGST ADOLESCENT GIRLS LIVING IN THE HOSTELS OF KOTA

**Ms. Anjali Saxena**  
Research Scholar  
University of Kota, Kota

**Dr. Bindu Chaturvedi**  
Senior Lecturer,  
Department of GPEM

---

### ABSTRACT

*Being obese is a major malaise that is afflicting a vast chunk of youngsters living in the up-market localities of urban India. Over the years, obesity has become more of a lifestyle disorder rather than a medical problem and the root of course lies in the uniquely skewed dietary pattern followed by these adolescents. Looking good nowadays seems to be a necessity for the adolescents as they have to constantly live under peer pressure which makes it binding upon them to keep themselves sleek so as to be acceptable to one and all. In the earlier days, it wasn't much of a problem as so much of interaction amongst opposite genders wasn't a norm, life in schools and colleges were more about studies and discipline but today the scene has turned around to such an extent that looking beautiful and acceptable comes naturally to the girls and the ones who are not able to keep with the times seem lost and lag behind their peers. It's not just the clothes and the dressing sense that matter amongst the adolescents, rather it's the physique or the vital bodily statistics that seem to build the confidence among the youth of today.*

*Adolescence is considered to be such an age that undergoes rapid fire changes that are not just emotional and physical but physiological and hormonal as well. This is what makes this age the most significant when it comes to studying lifestyle disorders. It's also an age when keeping a check on what to eat appears to be burdensome as metabolism in this age is the most effective and almost everything that a youngster eats gets digested with an ease, a luxury that people have to lose with growing age. This is an age group that doesn't require much of a physical exercise to keep fit; as such adolescents may pick unhealthy eating habits*

*that may later on develop complications and either result in these adolescents putting on weight or contracting some chronic digestive ailment.*

*Obesity is an affliction that could primarily be seen amongst urban adolescents more than the rural ones as they are exposed more to a comfortable lifestyle where parents give them enough liberty to have their own vehicles thus making life pretty much lethargic for these young ones. Further, eating out quite often is a norm. Adolescents find it quite easy eating out almost 4 days in a week as they have enough money for that and there are too many outlets selling junk nowadays which is known to be one of the most significant reasons causing obesity. Though these youngsters have to suffer a lot in terms of loss of image, they don't seem to have much of a control on what they eat as growing age makes it almost imperative for them to eat passionately with an uncontrollable desire. Eating lots of fast food and food at roadside vendors makes them quite vulnerable to putting on weight and developing ailments which may cause them serious troubles in the days to come.*

**Key words:** Obesity, Vulnerable, ailment, chronic, peer pressure

---

## INTRODUCTION

The study was conducted amongst the adolescent girls of Kota living in hostels and preparing for competitive exams. Though it was quite difficult choosing a sample out of the girls belonging to different states, still it seemed imperative to do so as was the need. The only drawback being, girls from such varied states come to Kota that finding anything common amongst them is a complete challenge, let alone food. Food is something that changes in India with every state, so even if adolescents of the same age group are interviewed, it's highly unlikely to find them consuming the same food. It's not just a matter of choice; it's completely a matter of upbringing, like for instance girls born and brought up in families where non-vegetarian is a norm are pretty much fond of non-vegetarian food and leave no opportunity of gorging upon mutton, chicken or beef as and when they get to, the same doesn't hold true for girls born in families where non-vegetarian food is strictly restricted. Thus the quality of nutrients they intake can't be considered to be the same by any standards. The same can be said for the girls coming from southern states like Kerala and Tamil Nadu. Their food that is rice based is absolutely different from what the girls from the North love eating. For a while, if we keep this apart, we can very well compare girls from the same age group as they have more or less similar choices when it comes to choosing the best amongst the fast food available at big brand restaurants.

---

They all almost equally love junk like Burgers, pizzas and pastas which is universally known to be harmful but are a craze amongst the youngsters. It's very difficult to find an adolescent who doesn't love fast food. To the extent that in this age group, junk is a routine. It may not come as a shock, if an adolescent admits to consuming junk food even 7 days in a week if he or she has the financial resources to do so. The study chose 1050 adolescent girls living in the hostels of Kota as subjects as residing in a hostel brings along with it the burden to fend for yourself. Choosing the right mess to eat, setting a tight schedule for meals, developing enough discretion to choose what to eat and what not gets pretty difficult for an adolescent as this is an age when these young girls love to experiment new and innovative food every day. Hostels across the city were visited and the friendliest ones were chosen to target the subjects. Though we weren't expecting the girls to come up with absolutely honest answers still the study revealed a lot in terms of special interests that these adolescents possess. The subjects were chosen randomly as it would have been very difficult to select subjects based on certain fixed criteria. Neither caste, nor religion nor any other basis was brought into use while zeroing upon the subjects. Girls between the age group 16 to 25 were the ones chosen to be interviewed as they could be considered to be having almost matching consumption habits.

## **OBJECTIVES**

To carry forth the study expecting best results out of it requires a certain set of objectives that would help us sail smoothly. Objectives become a necessity as there is always a need to have a destination to be reached. Further objectives make it pretty easy for us to match our progress with the desired goals as it is not always possible to get the results almost as they were expected. Variations often occur between expectations and conclusions. The objectives decided were as follows:

1. To find out the number of hostel living girls out of the chosen sample who were consuming fast foods.
2. The frequency with which they visited fast food joints and other road side vendors for afternoon or evening snacks.
3. To find out the number of girls skipping meals especially breakfasts.
4. To find out the number of girls who were obese and overweight and were languishing as a result of that.
5. To find out the number of girls interested in consuming non-vegetarian food and the frequency with which they had it.

## **MATERIALS AND METHODS**

### **Selection of subjects:**

The study required a sample of girls to be taken as subjects from the hostels of Kota as the study has focused on hostel living girls and the ones who are specifically suffering from obesity. Hostels and paying guest facilities are the only accommodations where majority of girls from outside are living. A total of 1050 girls were chosen randomly out of 12 different hostels. The selection was done arbitrarily without any fixed criterion. The only similarity amongst the girls being that they all belonged to upper middle income group and thereby eating habits were almost the same. Though they all hailed from different regions, still their fast food eating habits were presumed to be the same. Though 1050 girls out of the thousands of girls coming to Kota are not their true representative but since they all belong to the same age group, habits of eating are more or less the same.

### **Questionnaire**

The girls were handed over a detailed questionnaire to be answered subjectively as well as objectively. The questions were open-ended as well as close-ended and sought answers about the age, caste, financial background, dietary habits, beliefs and preferences regarding food. These questions have a special significance as they help us to deduce the true dietary pattern that an adolescent has picked as a result of his upbringing in a particular family. It's in fact the family only that inculcates a certain dietary habit in a child and what an adolescent eats is a true reflection of what he has learnt as a result of being in that family.

Further, the questionnaire also comprised questions that sought answers regarding the kind of knowledge these adolescents possessed about the importance of nutrition and the food that suited them the best and was in their best interests. It also seemed to seek answers to questions pertaining to the sources they utilized for gaining any vital information about food. The questionnaire was pretty much exhaustive in nature and also contained questions demanding answers to queries regarding the ailments that these youngsters normally suffered while being at the hostel.

Moreover, the questionnaire even comprised questions regarding the frequency with which these adolescents consumed fast foods like burgers and pastas as they are universally

acknowledged to be one of the major reasons behind obesity and other weight related problems. Fast foods like noodles, pizzas and burgers are nowadays a rage amongst the youth and the questionnaire concentrated upon seeking answers to questions regarding the frequency with which the girls chosen as subjects consume this junk. It was not just the fast food upon which the questionnaire focused, it also sought information regarding the frequency with which these young girls consumed cold drinks, candies, sweets and heavily salted snacks and wafers.

Last but not the least, the questionnaire employed a 24 hour recall method to seek information regarding what an adolescent living in a hostel ate across the day in terms of breakfast, lunch, supper or even the snacks, cold drinks and wafers that these adolescents may pick anytime without caring much about what time of day it is.

### **DIETARY PRACTICES**

These young adolescents are living far away from their parents and as a result, don't get much of an attention that is so much required in this age. This is an age when majority of these young girls want to experiment new and innovative foods almost every day as whatever becomes a routine gets boring and monotonous. This is also an age when metabolism is quite strong and anything they get to eat, gets digested too without much of a hassle. It's commonly seen that such youngsters love to gorge upon cakes, pastries, snacks, wafers, candies and patties all of which are heavily salted and thereby absolutely lethal to the youngsters in the long run. Further, these adolescents also love consuming too many of cold drinks which are high on sugar and thereby may cause the youngsters to gain weight. Same stands true for candies and chocolates which consist of excessive sugar, in fact these eatables are so high on sugar that they may cause imbalances in blood sugar levels even amongst those youngsters without any family history of diabetes. Most of the roadside food that these adolescents eat is high on hydrogenated oil and is thus downright harmful if consumed with a routine.

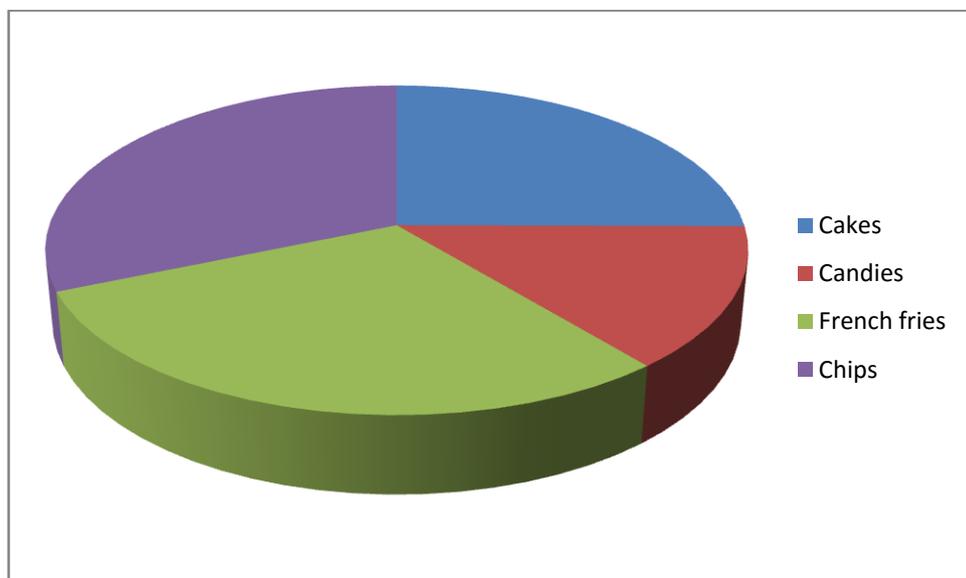
All the more, these adolescents have an erratic pattern of eating. They follow no schedules and eat when they want, no matter what time of day it is, which gradually causes them to suffer from digestive ailments which turn chronic with time especially when they are not cared for. It's not just the erratic schedule which troubles them, they are quite unmindful of the fact that what they are consuming most of the time may not cause them immediate harm but it will accumulate over the years to cause them all the trouble later.

Most of what they are eating is unhygienic, unhealthy and sometimes even partially cooked road side stuff high on salt and hydrogenated oil which takes a heavy toll on the youngster's body in the days to come.

### ANALYSIS OF DATA

1. The data gathered through a stiff questionnaire that was handed over to 1050 girls and meticulous prodding of adolescents gave us a rich insight into the consumption patterns of youngsters on a routine basis. As it was quite evident that most of these youngsters don't have healthy eating habits as a result of which they have to suffer innumerable physical problems. The data accumulated through the standard questionnaires has been tabled for a methodical analysis:

Food Products	Number of girls consuming this food (2 to 3 times a week) in %
Cakes	72
Candies	40
French fries	85
Chips	90



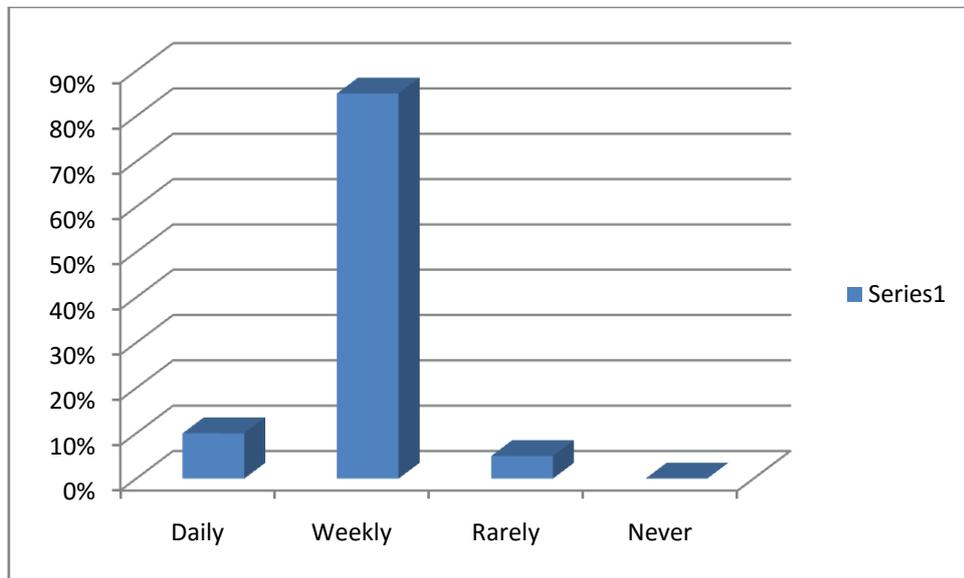
As the above given data is quite evident of the fact that girls living in hostels go on a random eating spree without giving much of a notice to what they are eating. The data quote above exhibits the fact that a big chunk of girls consume French fries and chips which are usually deep fried in hydrogenated oil and is one of the widely known reasons causing obesity among adolescents across the world. Further, cakes and candies which they love to consume on their whims are high on sugar which again is infamous and is notoriously known for causing obesity.

2. Another set of data that gave us vital information about the fast food consumption habits of adolescent girls living in the hostels of Kota made it amply clear that girls in this age love to devour anything junk irrespective of what the consequences will be. Most of the fast food is easily available at innumerable outlets present in every nook and corner of Kota and is of course as delicious as it is harmful. Thus out of the 1050 girls interviewed as subjects, these were the figures collected for an analysis:

Daily	Weekly	Rarely	Never
10%	85%	5%	0%

\*The figures given above represent the number of girls ( in percentage) consuming fast food.

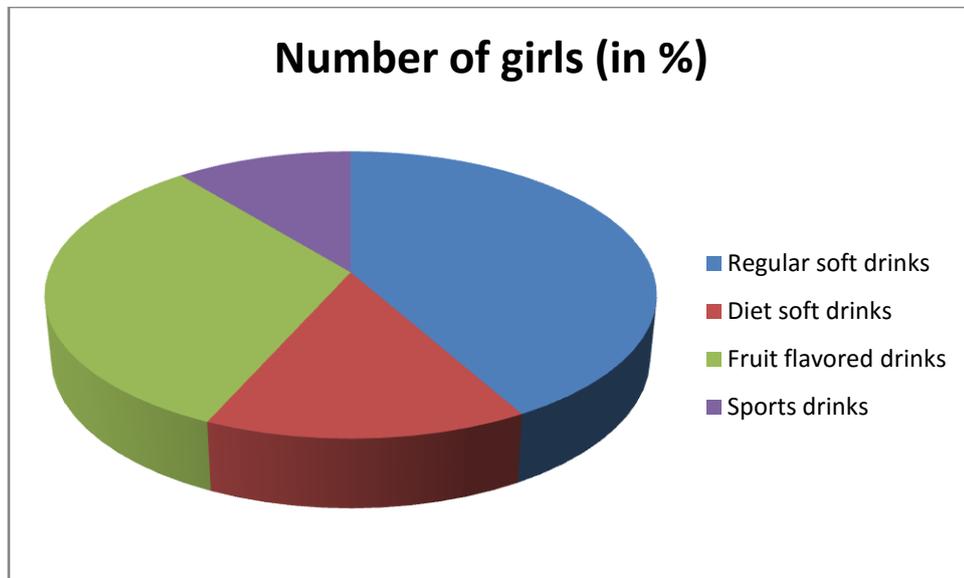
As the data quoted above quite convincingly indicates that a vast majority of girls love consuming fast food on a weekly basis. Most of the fast food products like burgers, pastas and pizzas are made out of very finely ground flour which is known to be harmful to the intestines. Further, too much of fat, butter and oil goes into stuffing the burgers and pizzas which are medically proven to be the reason behind obesity amongst the adolescents.



\*The data given above represents the frequency with which girls consume fast food.

- The girls chosen as subjects were even assessed for their habit of consuming soft drinks which are nowadays quite a fashion amongst the adolescents thanks to the TV advertisements featuring stars endorsing various brands of soft drinks. The data collected as a result of the questionnaire handed over to the subjects revealed significant figures to be analyzed.

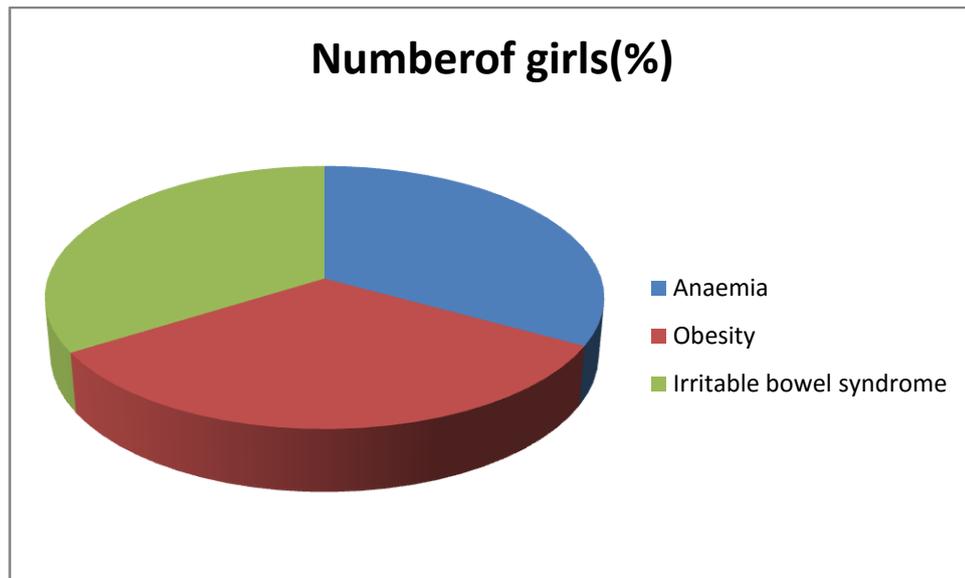
Type of unhealthy Drink	Number of girls (in %) consuming soft drinks 2 to 3 times a week
Regular soft drinks	81%
Diet soft drinks	28.57%
Fruit flavored drinks	62.85%
Sports drinks	21%



As the graph plotted above makes it sufficiently clear that about 81% of girls consume soft drinks 2 to 3 times a week. As is well known across the world that these aerated drinks are carbonated and are high on sugar and preservatives. Sugar is such excessively present in these soft drinks that a regular consumption by adolescents makes them vulnerable to diabetes and obesity. Sugar causes adolescents to put on extra weight as is well pronounced by medical practitioners and nutritionists around the world.

- The subject girls living in hostels were even questioned regarding their visits to nutritionists and Doctors and a disturbing trend revealed itself. The questions focused more on unraveling the problems that took the adolescents to doctors and it was found that obesity and anaemia were some of the major reasons behind their visits to doctors. Though obesity is known to cause repercussions and it manifests itself in many ways but with the youngsters, the reason is more superficial. Most of these adolescents are obsessed with self esteem and looking good for them is a significant issue. The data collected was tabled for a detailed analysis later.

Disease	Anaemia	Obesity	Irritable bowel syndrome
Number of girls (%)	68.28%	68%	70%



As the pie plotted above quite clearly suggests that around 68% of adolescent girls living in the hostels of Kota are suffering from obesity and majority of these girls get to visit doctors more because of being over-weight which has gradually become a lifestyle disorder. Most of the girls today are conscious about their looks and obesity is one of the major reasons that hamper their looks. Obesity may cause problems later regarding abnormal blood pressure but initially it's the peer pressure and the need to look good which troubles the adolescents the most.

#### **NUTRIENT INTAKE:**

It was found during the course of the research that most of these adolescents consume their meal quite unmindful of its nutritive value, the simple reason being they are not staying with parents and as a result there is a sheer lack of guidance. Further, most of the junk they eat lacks the vital nutrients that are badly needed to keep them growing and in a good shape. As they often skip their meals, they compensate for that by consuming snacks at odd hours. Snacks, as it is very well known are high on salt and may cause them to suffer abnormal blood pressures later. Further, these snacks are usually cooked in hydrogenated oil that is normally used and re-used at road side vendors and is a major reason today behind obesity that is afflicting a large number of adolescents worldwide. They skip their meals which they substitute with fast food. Green leafy vegetables which are a major source of iron, zinc and folic acid are never a part of their menu and lack of which is known to cause anaemia among

these youngsters. Moreover, they never consume milk or milk products which are a rich source of vitamin A and calcium and may keep them fit. Fruits and fruit juices too are never a part of their routine menu and thereby their consumption of vitamin C is almost negligible which weakens their immunity. Further, most of the fast food that they eat lacks roughage which keeps their bowels in order and free from constipation. Thus their nutrient intake is significantly skewed and doesn't qualify in any way to be called healthy. Obesity is all about eating junk, extra dosages of sugar, butter and hydrogenated oil.

## **CONCLUSION**

1. In a nutshell, most of the adolescents living away from parents have the liberty to take their own decisions and as such most of them have a distorted pattern of eating. They eat all those stuffs in a routine which should otherwise be eaten rarely and that results in obesity.
2. For instance, skipping meals and consuming fast foods more than twice in a week, consuming soft carbonated drinks excessively is a routine followed commonly by these adolescents as a result of which they put on weight.
3. Consuming snacks high on salt and hydrogenated oil the whole day again makes them susceptible to obesity. Snacks kill their desire to eat regular healthy meals which again contributes to digestive disorders.
4. Sweets and candies are a routine with adolescents and they add on to their weight as is well known too much of sugar may lead to obesity.
5. Majority of these adolescent girls living in Kota for studies don't get to involve themselves into any kind of physical activity or sport which doesn't let them burn these extra ounces of fats that they accumulate as a result of junk and this may also be one of the reasons causing the problem of obesity amongst these youngsters.

## **RECOMMENDATIONS**

1. Adolescents living far away from parents in hostels should take care to eat meals at proper hours as it keeps their energy levels high. Especially the breakfast is the most important meal of the day as it boosts the adolescents to be on their toes all the while.
2. They should ensure not to skip any meal as they get to make up for that by consuming unhealthy snacks that are heavily salted and harmful.

3. They should avoid consuming fast food like burgers and pizzas as they have almost no nutritive value and no roughage to keep their digestion in order. They normally cause chronic digestive ailments like flatulence and constipation.
4. Likewise adolescents living in hostels should avoid consuming too much of soft drinks which contain excessive sugar and thereby are detrimental to health.
5. They should even avoid consuming excessive cakes, chocolates and candies which contain too much of sugar and fat which cause them to put on weight and even develop disorders in digesting food.
6. Adolescents should involve themselves in some or other kind of physical activities like walking, cycling or some field sport which may help them in burning those extra fats they have accumulated.

## REFERENCES

1. Gopalan.C.B.V.shastri and S.C.Balasubramanian.1989.Nutritive Value of Indian Foods. Indian Council of Medical Research, Hydrabad: National institute of Nutrition.
2. Gafoorunossa and K. Krishnaswamy. 2002 Diet and Heart disease. Hydrabad: National institute of Nutrition.
3. Ahmed,Farunk, Momtaz Zareen, Moudadar Karn, Banu Rehman, Pervin Cadi, Mohamad Haq, Jadson Nazmul and A. Alan.1998. "Dietary Pattern, nutrient intake and growth of adolescent school girls in urban Bangladesh." Public Health nutrition.
4. Tarvinder Jeet Kaur, G.K.Kochar and Tanu Agarwal. 2007. "Impact of Nutrition Education On Nutrition adequacy of Adolescent Girls."
5. B.Shrilakshmi. Dietatics. New Age International Publishers.
6. Sumati R. Mudambi, M.V.Rajagopal. Fundamentals of foods, Nutrition and Diet therapy New Age International Publishers.
7. Mary Story and Michael D. Resnick. Adolescent' view on Food and Nutrition-a Study.
8. Pallavi Barooah 2012. "Adolescent' Nutrition, Attitudes and Practices.
9. ICMR.1999. Recommended dietary intake for Indians. Indian Council of Medical Research, New Delhi
10. Jelliffe D B 1966. The Assessment of Nutrition of the community.World Health Organisation Monograph series No.53, Geneva.

# INTERNATIONAL JOURNAL OF RESEARCH IN ECONOMICS AND SOCIAL SCIENCES (IJRESS)



ISSN : 2249-7382

Website : [www.euroasiapub.org](http://www.euroasiapub.org) Email: [editorijrim@gmail.com](mailto:editorijrim@gmail.com)

## Certificate of Publication

This is to Certify that Paper Entitled

Dying To Be Thine - A Study of Kota City Adolescent  
Girls (Age Between 16 To 25)

Authored by

Ms. Anjali Saxena

Published in

Volume ..... 6 ..... Issue ..... 8 ..... Month ..... August ..... Year ..... 2016 ..... in

**International Journal of Research Economics and Social Sciences (IJRESS)**

(Impact Factor: 6:225..)

The research paper is evaluated on all the scholarly standards of evaluation based on double blinded review process by the editorial board following the globally adopted code of conduct with no exception.



Managing Editor



सत्यमेव जयते

# University Intellectual Property Rights Cell

Department of Commerce & Management

University of Kota, Kota (Raj.)



## *Certificate of Participation*

This is to certify that Prof./Dr./Mr./ Ms. Anjali Saxena.....

has participated in one day workshop on **“Intellectual Property Rights”** held on 20. Nov. 2023

which was organised by the Department of Commerce and Management in Collaboration with the Department of Science and Technology, Govt. of Rajasthan.

**Project Officer**

Department of  
Science & Technology, Kota

**Dean & Head**

Department of Commerce & Management  
Nodal Officer, IPR Cell University of Kota, Kota



Women Cell, University of Kota, Kota



## National Seminar

On

“Socio-Legal Issues and Challenges of Female  
Foeticide and Infanticide in India”

(Sponsored by : National Commission for Women, New Delhi; UGC, New Delhi & University of Kota, Kota)

4<sup>th</sup> – 5<sup>th</sup> October, 2013

## Certificate

It is certified that Prof./Dr./Mr./Mrs. /Ms. Anjali Saxena  
of University of Kota, Kota has attended / presented a paper (oral/poster) /  
chaired the session in the national seminar organised by Women Cell, University of Kota, Kota.

Date : 5<sup>th</sup> October, 2013

Ashu Rani  
Prof. Ashu Rani

Convener, National Seminar  
Women Cell, University of Kota, Kota



# XIX INTERNATIONAL CONFERENCE OF RSA



ORGANIZED BY:

Rajasthan Sociological Association

and

Department of Sociology, B.S.R. Government Arts College, Alwar (Rajasthan)

on

Human Rights: Evolution, Implementation and Evaluation

December 14th-16th, 2012

SPONSORED BY: UGC & ICSSR



## CERTIFICATE

This is to certify that Prof./Dr./Mr./Mrs./Miss. Angali Saxena Designation  
Research Scholar Institution Kolc Uni. Kolc  
participated in the conference and delivered a plenary lecture/presented research paper/chaired a session Human Right Evaluation  
in Education

  
**Dr. R.S. Kholia**  
Principal & Chief Patron

  
**Prof. Mohan Advani**  
President RSA

  
**Dr. Alok Kumar Meena**  
Organizing Secretary

# SYMPOSIUM ON E-RESOURCES

16<sup>th</sup>-17<sup>th</sup> December, 2013



**Department of Library and Information Science**  
**University of Kota, Kota (Rajasthan)**

## *Certificate of Participation*

This is to certify that Prof./Dr./Mr./ Ms. .... *Anjali Saxena* .....

has participated in two days symposium on “E-Resources” organised by the Department of  
Library and Information Science.

*Anna Kaushik*  
**Dr. Anna Kaushik**  
Programme Coordinator

*Ashu Rani*  
**Prof. Ashu Rani**  
Programme Convener



# National Seminar



Indian Council of  
Social Science Research

On

## Administrative Culture in India: Transparency and Accountability

[In Present Statutory Perspective]

February 20-21, 2015

**Organized by**

Department of Social Science  
University of Kota, Kota

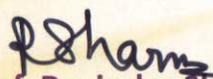
**Sponsored by : ICSSR, New Delhi**

## Certificate

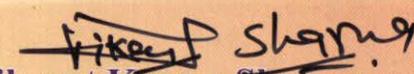
Certified that Prof./Dr./Mr./Ms. Anjali Saxena (Research scholar)  
of (Name of the Institution) University of Kota

has participated in the National Seminar organised by Department of Social Science, University of Kota.

He/She also acted as a key Speaker/Chairperson/Paper Presenter on the following topic (title)-

  
Prof. Ravindra Shrama  
Patron

  
Dr. J.P. Sharma  
Co-Convener

  
Dr. Vikrant Kumar Sharma  
Convener & Organizing Secretary



Vardhman Mahaveer Open University, Kota  
Rawatbhata Road, Kota-324010, Rajasthan

## *Certificate of Participation*

This is to certify that Dr. /Mr. /Ms. *Anjali Saxena*.....has actively participated in the workshop on **“Health of Higher Education in India”** organized by Vardhman Mahaveer Open University, Kota, Rajasthan on 5<sup>th</sup> of September, 2014.

**Happy Teacher's Day**

*Keerti*  
Dr. Keerti Singh  
Organizing Secretary

*R. R. Singh*  
Dr. R. R. Singh  
Convener (Education)

*Vinay Kumar Pathak*  
Prof. (Dr.) Vinay Kumar Pathak  
Vice-Chancellor, VMOU, Kota



# International Research Journal of Human Resources & Social Sciences

ISSN (O) 2349-4085, ISSN (P) 2394-4218

## Certificate of Publication

This is to certify that Paper entitled

A STUDY TO ASSESS THE DIETARY HABITS THAT LEAD TO OBESITY AMONGST  
ADOLESCENT GIRLS LIVING IN THE HOSTELS OF KOTA

Authored by

Ms. Anjali Saxena

Published in : Volume : 3 Issue : 8 Month : AUGUST Year : 2016

International Research Journal of Human Resources & Social Sciences

(Impact Factor : 3.866)

The research paper is evaluated on all the scholarly standards of evaluation based on double blinded review process by the editorial board following the globally adopted code of conduct with no exception.

Website : [www.aarf.asia](http://www.aarf.asia), E-mail : [editoraarf@gmail.com](mailto:editoraarf@gmail.com), [editor@aarf.asia](mailto:editor@aarf.asia)

*V. Deodall*  
Managing Editor



**J. D. B. Govt. Girls College, Kota**

**ANNUAL RESEARCH SEMINAR**

**JANUARY 23, 2014**

**CERTIFICATE**

This is to certify that Dr./Mr./Mrs. .... Anjali Saxena.....  
Faculty Member/Research Scholar, Department of .... G.P.E.M......  
has participated/presented research work in annual research seminar held  
at J.D.B. Govt. Girls College, Kota on January 23, 2014, organized by the  
Centre for Excellence (Model College).

**Prof. Sandhya Gupta**  
Convener & Incharge Model College

**Prof. H.S. Meena**  
Principal