

**A COMPARATIVE STUDY TO ASSESS THE LIFE STYLE OF SCHOOL
CHILDREN WITH NORMAL WEIGHT AND OVERWEIGHT IN A SELECTED
SCHOOL, AT COIMBATORE**

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ABSTRACT

A Comparative Study to assess the Lifestyle of School Children with Normal Weight and Overweight in a Selected School at Coimbatore.

The aim of the study was to assess the physical activity/exercise of normal weight and overweight children in and out of the school, their eating pattern and to see whether there is any difference.

A descriptive comparative survey method was used in this study. The study was conducted in R.V.S Matriculation School, Sullur. The study sample were 50 children, 25 normal weight children and 25 overweight children studying between 7th to 11th standard, selected by Convenience sampling method.

The tool consisted of 26 questionnaire regarding physical activity/exercise and eating pattern. The study was based on “Health Belief Model”. The questionnaire was handed over to both normal weight and overweight children with adequate explanation with a request to fill and it return after filling the questionnaire. The data was analyzed using descriptive and inferential statistics.

The findings of the study showed that majority of normal weight children were engaged in physical activity/exercise compared to majority of overweight children who were engaged in sedentary activities. 100% of normal weight children scored good for eating habits where as 60% of overweight children scored poor for eating habits. Mean score percentage of eating habits was higher (92.5%) for normal weight children compared to only 75.63% for overweight children.

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TABLE OF CONTENTS

CHAPTER	CONTENT	PAGE NO
I	INTRODUCTION	
	1 Background of the study	1
	2 Need for the study	6
	3 Statement of the problem	8
	4 Aim of the study	8
	5 Specific objective	8
	6 Operational definition	8
	7 Assumption	9
	8 Delimitation	9
	9 Scope of study	9
	10 Conceptual frame work	9
II	REVIEW OF LITERATURE	11
III	METHODOLOGY	
	1 Research approach	16
	2 Setting of the study	16
	3 Population	16
	4 Sample size	17
	5 Sampling technique	17
	6 Criteria for sample selection	17
	7 Description of the tool	17
	8 Scoring	19
	9 Scoring Interpretation	19
	10 Development of the tool	19
	11 Content validity	20
	12 Reliability	20
	13 Pilot study	20

CHAPTER	CONTENT	PAGE NO
	14 Data collection procedure	21
	15 Plan for data analysis	21
IV	ANALYSIS AND INTERPRETATION	23
V	DISCUSSION	55
VI	SUMMARY, FINDINGS, CONCLUSION, IMPLICATION AND RECOMMENDATION	61
	BIBLIOGRAPHY AND REFERENCES	66
	APPENDICES	69

LIST OF TABLES

S. NO	TITLE	PAGE NO
I	Frequency and percentage distribution of normal weight and overweight children based on demographic characteristics	24
II	Frequency and percentage distribution of samples based on Body Mass Index	30
III	Frequency and percentage distribution of normal weight and overweight children in 3 categories of physical activity during games period at school	31
IV	Frequency and percentage distribution of normal weight and overweight children in 3 categories of physical activity while at school	32
V	Frequency and percentage distribution of normal weight and overweight children according to category of physical activity after returning from school	34
VI	Frequency and percentage distribution of normal weight and over weight children according to categories of physical activity during weekend and holidays	35
VII	Frequency and percentage distribution of normal weight and overweight children according to types of physical exercises	37
VIII	Frequency and percentage distribution of normal weight and over weight children according to sedentary activities after returning from school	39
IX	Frequency and percentage distribution of normal weight and over weight children according to mode of travel	41
X	Average duration of moderate and vigorous activity of normal weight and overweight children in and out of school and during weekend and holidays in hour per day.	43
XI	Frequency and percentage distribution of normal weight and overweight children based on eating pattern at home	44

S. NO	TITLE	PAGE NO
XII	Frequency and percentage distribution of normal weight and overweight children based on number of meals per day	45
XIII	Frequency and percentage distribution of normal weight and overweight children based on packed lunch	46
XIV	Frequency and percentage distribution of normal weight and overweight children based on taking snacks while watching television	47
XV	Frequency and percentage distribution of normal weight and overweight children based on items preferred to buy	48
XVI	Frequency and percentage distribution of normal weight and overweight children based on purchase of soft drinks beverages from outside	49
XVII	Frequency and percentage distribution of normal weight and overweight children based on frequency of food item purchased and intake of beverages	50
XVIII	Mean score of eating habits and level of significance of normal weight and over weight children	52
XIX	Frequency and percentage distribution of normal weight and overweight children based on level of eating habits	54

LIST OF FIGURES

S. NO	TITLE	PAGE NO
I	Conceptual frame work	10
II	Frequency and percentage of samples based on Body Mass Index	30
III	Three categories of physical activities of normal weight and over weight children	31
IV	Percentage of normal weight and overweight children in three categories of physical activity while at school	33
V	Percentage of normal weight and over weight children in three categories of physical activity during weekend and holidays	36
VII	Percentage of normal weight and over weight children according to types of physical exercises	38
VIII	Percentage of normal weight and overweight children according to sedentary activities after returning from school	40
IX (a)	Percentage of normal weight and over weight children according to mode of travel to school	42
IX (b)	Percentage of normal weight and over weight children according to mode of travel for other purpose	42
X	Average duration of moderate and vigorous activity of normal weight and over weight children in and out of school and during weekend and holidays in hour per day	43
XI	Percentage of normal weight and over weight children based on eating pattern at home	44
XII	Percentage of normal weight and over weight children based on items preferred to buy	48
XIII	Percentage of normal weight and over weight children based on purchase of soft drinks beverages from outside	49
XIV	Percentage of mean score of normal weight and over weight children	53
XV	Percentage of normal weight and over weight children based on level of eating habits	54

INTRODUCTION

CHAPTER I

INTRODUCTION

BACKGROUND OF THE STUDY

"Prevention is better than Cure"

The most important thing in life is a good health. It is widely recognized that a healthy childhood is the foundation for a healthy adult life. Infants and children obviously need extra nutrition and proper physical activity and exercise for their growth and they consume the best within the family set up for their growth. Good dietary pattern is essential for building up bones. Habits formed in childhood have a long term impact on health and wellbeing. In this present climate, it is important that children are encouraged to engage in some form of physical activity on a regular basis. Nutrition and activity levels have a key impact on children's health and wellbeing. Children who partake in regular physical exercise remain mentally alert and have enhanced level of concentration, are more likely to be active adults, have a reduced risk of heart disease and experience a boost in confidence and self-esteem. A normal weight is referred as child is between 90 to 110% and above 110% referred as obesity (**Gomez' classification**). Normal weight also indicated in terms of Body Mass Index. People with Body Mass Index value between 18.5 to 25 are considered as having normal weight and between 25 to 29 are considered as having obesity (**World Health Organization 2004**).

Strong bones, good muscle tone, and lower risk of developing chronic diseases are some of the key benefits derived from regular physical activity. Further more, being physically active promotes psychological wellbeing and reduces feelings of depression and anxiety. Participation in physical activity tends to decline as children get older. To maintain good health status, the "Dietary guidelines and Mypyramid" recommend that children and adolescents engage in atleast 60 minutes of physical activity on most, preferably all, days of the week (**Foundation media Guide on Food Safety and Nutrition 2007-2009**).

Increased consumption of more energy dense nutrient, poor foods with high levels of sugar and saturated fats, combined with reduced physical activity, have led to an increase in obesity rates in some areas of North America, United Kingdom, Eastern Europe, Middle East, and China. The obesity epidemic is not restricted to industrialized societies, this increase is often faster in developing countries than in the developed world.

Globally, there are more than 1 billion overweight adults, at least 300 million of them obese and is a major contributor to the global burden of chronic disease and disability. The prevalent rates of overweight and obesity among U.S children and adolescents aged 6-11 and 12-19 years, respectively, were 15.3 and 15.5% in 1999-2000. Overweight is arguably one of, if not the singly, most important problem affecting the health and well being of many countries including India (**World Health Organization 2009**).

For most people, overweight and obesity are caused by not having the right energy balance. Weight is balanced by the amount of energy or calories got from food and drinks(this is called energy IN) equaling the energy, your body uses for things like breathing, digesting, and being physically active (this is called energy OUT). To maintain a healthy weight, energy IN and OUT don't have to balance exactly every day. It's the balance over a period of time that helps you maintain a healthy weight. Over weight and obesity happen over time when you take in more calories than use. There are many factors that influencing overweight and obesity (**National Institute of Health, 2000**) and they are as follows:

Many Americans are not very physically active as compared to Indians. One of the reasons is that many people spend hours in front of Television and Computers, doing school work. In fact more than 2 hours a day of regular TV watching time has been linked to overweight and obesity.

Other reasons for not being active are relying on cars instead of walking to places, fewer physical demands at work or at home. Because of modern technology and

conveniences reduce the need to burn calories, and lack of physical education classes in schools for children. Inactive lifestyle also raises risk for heart disease, high blood pressure, diabetes, colon cancer and other health problems.

Environment does not always help with healthy lifestyle habits; in fact, it encourages obesity and overweight. Some reasons are lack of neighborhood sidewalks and safe places for recreation (not having area parks, trails, sidewalks and affordable gyms make it hard for people to be physically active), work schedules (people often say that they don't have time to be physically active given the long hours at work), oversized food portions (Americans are surrounded by huge food portions in restaurants, fast food places, movie theaters, supermarkets and even home. Eating large portions means too much energy IN. Over time, this will cause weight gain if it isn't balanced with physical activity), lack of access to healthy foods (some people don't live in neighborhoods that have supermarkets that sell healthy foods such as fresh fruits and vegetables), Food advertising (Americans are surrounded by ads from food companies. Often children are the targets of advertising for high – calorie, high fat snacks and sugary drinks).

Studies of identical twins that have been raised apart show that genes have a strong influence on one's weight. Overweight and obesity tend to run in families. The change of being overweight is greater if one or both of parents are overweight or obese. On the other hand, if a family adopts healthy food and physical activity, obesity reduces.

Sometimes hormonal problems cause overweight and obesity. Hypothyroidism is a condition in which the thyroid gland does not make enough thyroid hormone. Lack of thyroid hormone will slow down your metabolism and cause weight gain. Cushing syndrome is a condition in which the body's adrenal glands make too much of the hormone cortisol. People with Cushing's syndrome gain weight, have upper body obesity, a rounded face, fat around neck, and thin arms and legs.

Some people eat more than usual when they are bored, angry or stressed. Over time, over eating will lead to weight gain and may cause overweight or obesity.

As get older, tend to lose muscle, especially if you are less active. Muscle loss can slow down the rate at which body burns calories. It does not reduce calorie intake that may gain weight in later ages. Many women gain around 5 pounds during menopause and have more fat around the waist.

Lack of sleep is another factor. Studies find that the less people sleep, the more likely they are to be overweight or obese. People who report 5 hours a night, for example, are much more likely to become obese compared to people who sleep 7-8 hours a night. People who sleep fewer hours also seem to prefer eating foods that are higher in calories and carbohydrates, which can lead to over eating, weight gain and obesity over time. Hormones that are released during sleep will control the appetite and the body's use for energy. People who do not get enough sleep on a regular basis seem to have high levels of a hormone called Ghrelin (which cause hunger) and low levels of a hormone called Leptin (which normally helps to curb hunger).

Certain medicines such as corticosteroids (for example prednisone), antidepressants (for example Elavil), and medicine for seizures (for example Neurontin) may cause to gain weight. These medicines can slow the rate at which the body burns calories, increase appetite or cause body to hold on to extra water – all of which can lead to weight gain.

Some people gain weight when they stop smoking. The reason is nicotine raises the rate at which the body burns calories, so burn fewer calories when they stop smoking. Smoking is a serious health risk, and quitting is more important than possible weight gain.

Epidemiological studies have shown a progressive increase in the incidence of hypertension, diabetes mellitus, and coronary heart disease, sleep apnea syndrome, and certain cancers in obese persons. Epidemiological and metabolic studies conducted over the last 15 years have confirmed that a high proportion of abdominal fat is a major risk factor for coronary heart disease, type 2 diabetes mellitus and related mortality.

The major reason for overweight during childhood are over consumption of junk food, because most of these items are high on calories. It is postulated that consumption of extra 100 calories per day will result in 5 kg weight gain in one year time. Another important reason for overweight includes social lifestyle, lifestyle of family, no control over watching television and using computers and lack of physical activity (**World Health Organization, 2000**). A high degree of parental control of diet is linked to a child's inability to regulate food intake and to the amount of body fat. Hours of television watching is associated with overweight in children over one fourth of children report watching four or more hours of television per day. Children who ate more times per day were less likely to be heavy than children who ate fewer times per day.

Being overweight or obese is not a cosmetic problem. It greatly raises the risk in health consequences in adult. Some consequences (**US Department of Health and Human Services, 2007**) are:-

An estimated of 300,000 premature deaths per year may be attributable to obesity. Individuals who are obese (BMI \geq 30), have a 50 – 100% increased risk of premature death from all cause, compared to individuals with a healthy weight.

Heart problems such as heart attack, congestive heart failure, sudden cardiac death, angina or chest pain and abnormal heart rhythm is increased in persons who are overweight or obese BMI \geq 25.

Weight gain of 11-18 pounds increases a person's risk of developing type II diabetes to twice that of individuals who have not gained weight. Over 80% of people with diabetes are overweight or obese.

Overweight and obesity are associable with an increased risk for some types of cancer including endometrial (cancer of the lining at the uterus) colon, gallbladder, prostate, kidney and postmenopausal breast cancer. Women gaining more than 20 pounds from age 18 to midlife double their risk of post menopausal breast cancer, compared to women whose weight remains stable. Overweight and obesity are

associated with increased risk of gall bladder disease, incontinence, increased surgical risk and depression.

Sleep apnea is more common in obese persons. Obesity is associated with a higher prevalence of asthma. For every 2 pound increase in weight, the risk of developing arthritis is increased by 9-13% symptoms of arthritis can improve with weight loss.

Risk factors for heart disease such as high cholesterol and high blood pressure occur with increased frequency in overweight children and adolescents compared to those with a healthy weight. Overweight adolescents have a 70% chance of becoming overweight or obese adults. The most immediate Consequences of overweight, as perceived by themselves, is social discrimination.

Being overweight and obesity are largely preventable. The key to success is to achieve an energy balance between calories consumed and used. Effective weight management for individuals and groups includes prevention, weight maintenance, management of co-morbidities and weight loss.

Research over the past four decades suggests that childhood is a period when dietary and lifestyle patterns are initiated, that has implications for coronary heart disease and other morbidity risks in later adult life. Incidence of childhood obesity and overweight is on the rise since last few decades and is still continuing to rise.

NEED FOR THE STUDY

Childhood is a period that markedly known for more of play and lot of fun. But in the past few decades it was noted that children sit along hours in school, tuition, in front of television or videogame or in travel and spend very little time for active physical activity.

Parents and teachers also focused more on their academic activities and pay very little attention towards their physical activity. Most of the time they forget that regular

physical activity is a good way to strengthen the bone, tone up their muscles and reduce the risk for chronic degenerative diseases. It is important for their physical and mental wellbeing, with heavy syllabus children struggle to cope up with their studies, hence restrict their play time and spend more hours in studies which makes them sedentary and it may predispose to overweight and obesity.

Whatever extra time they have always focusing on videogames and other indoor games, sitting comfortably at home which makes them obese.

Prevalence of overweight and obesity among school children is gradually increasing and hence action at right time is very essential. The problem is global and increasingly expands into the developing world; for example in Thailand the prevalence of obesity in 5 - 12 years old children rise from 12.2% - 15.6% in just two years.

Nurse, here is a guide to the family in treatment regimen such as behavioral management especially decrease sedentary habits, watching TV for a longer time, adjust child in family food pattern, never allow junk food for main food and incorporate behavioral process slowly and gradually, preferably one at a time, restricting extreme calorie is never suggested as it adversely effects/ growth and development and the concept of normal eating (**Sumitha Chakraborty, 2009**).

The practice of school nursing began in the United States on October 1, 1902 when the initial role of the school nurse was to reduce absenteeism by intervening with students and families regarding healthcare needs related to diseases. While the nurses role has expanded gauntly form its original focus. Several roles of the school nurse are, nurse can provide direct health care to students and staff, leadership for the provision of health services, screening and referral far health conditions, promotes a healthy school environment, promotes health, serves in a leadership role for health policies, serve as a liaison school personnel, family, community, and health care, provide complete information regarding behavioral management, family involvement and dietary management and serve as a leadership role for school health program (**National Association of School Nurses, 2009**).

Healthy children are successful learners. The nurse has a multi- faceted role within the school setting, one that supports the physical, mental, social, emotional health of students and their success in the learning process.

In view of the above magnitude of the problem, the Investigator realize that need to know the lifestyle of children with normal weight and overweight are same or there exists any difference. This motivates me to conduct a comparative study to assess the lifestyle of school children with normal weight and overweight children in a selected school at Coimbatore.

STATEMENT OF THE PROBLEM

A Comparative Study to assess the Lifestyle of School Children with Normal Weight and Overweight in a Selected School at Coimbatore.

AIM OF THE STUDY

The aim of the study was to assess the physical activity / exercise of normal weight and overweight children in and outside of school and their eating pattern at home and outside in order to understand the similarities and differences of the two groups.

SPECIFIC OBJECTIVES

1. To assess the Body Mass Index of normal weight and overweight children.
2. To assess and compare the physical activity of normal weight and overweight children in and out of school.
3. To assess and compare the eating pattern of normal weight and overweight children.
4. To compare the eating habits of normal weight and overweight children.

OPERATIONAL DEFINITION

Lifestyle:

It refers to the way a person or group of people live, including the place they live in, the things they own, the kind of job they do, and the activities they enjoy. The current study refers to the way of life especially physical activity, exercise and food habits.

Overweight:

It refers to the calculated body mass index for age which lies between 26-30

Normal weight:

It refers to the calculated body mass index for age which lies between 18 - 25.99

ASSUMPTION

- The children will have different / various lifestyle practices.
- Childhood overweight is a major contributing factor for cardio vascular problem, endocrine disorders in adult life.
- The lifestyle of children is influenced by socio economic and cultural factors.
- Diet and exercise will have an impact on obesity.

DELIMITATION

The study is delimited to

- School children in the age group of 12-16 years.
- Studying in one school
- Studying in standard between 7th to 11th

SCOPE OF THE STUDY

The study will highlight the physical activity, exercise pattern, dietary pattern and sedentary activities among normal weight and overweight children. It will show similarities and dissimilarities among normal weight and overweight children with regard to physical activity in and out of school environment. By knowing this we can identify the problems and helps take necessary action to prevent the present strategy.

CONCEPTUAL FRAMEWORK

Conceptual framework refers to interrelated concepts or abstraction that are assembled together in some rational scheme by virtue of this relevance to a common theme (**Polit and Hunger-1999**). The conceptual framework of this study is based on **Rosenstock's** and **Becker and Maimans's** (1975) "**Health Belief Model**". Address the relationship between a person's belief and behavior. It provides a way of understanding

and predicting how clients will behave in relation to their health & how they will comply with health care therapies.

The first component of this model involves the individual's perception of susceptibility to an illness. For example, a client needs to recognize the familial link for coronary artery disease. After this link is recognized, particularly when one parent and two siblings have died in their 4th decade from myocardial infarction, the client may perceive the personal risk of heart disease. In this study school children between 12 – 16 years of age need to recognize the importance of maintaining normal weight and consequence of overweight.

The second component is the individuals perception of the seriousness of the illness. This perception is influenced and modified by demographic and socio-psychological variable, perceived threats of the illness such as cardio vascular disease, endocrine problem and some type of cancer including endometrial, colon, gallbladder, and kidney and cues to action (e.g. mass media campaigns and advice from family, friends, and medical professionals).

The third component is the likelihood that a person will take preventive action results from the person's perception of the benefits and barriers. This model helps to understand factors influence client's perception, belief and behaviors. Prevention action may include lifestyle changes, increased adherence to medical therapies, or a search for medical advice or treatment. It helps to determine the likelihood that the client will or will not partake in healthy behaviors, In my study the benefits include participation of moderate to vigorous activities, decreased sedentary activities and good eating habits. The barriers include continues watching TV, decreased physical activity and bad habit of dietary pattern. Likelihood of taking recommended preventive health action includes all school teachers and family members should take responsibilities for maintaining regular healthy lifestyle. This model helps to understand factors influences client's perception, belief & behaviors.

Fig-1 Highlights the Conceptual Model based on Rosenstoch's, Becker and Maimans's "Health Belief Model"

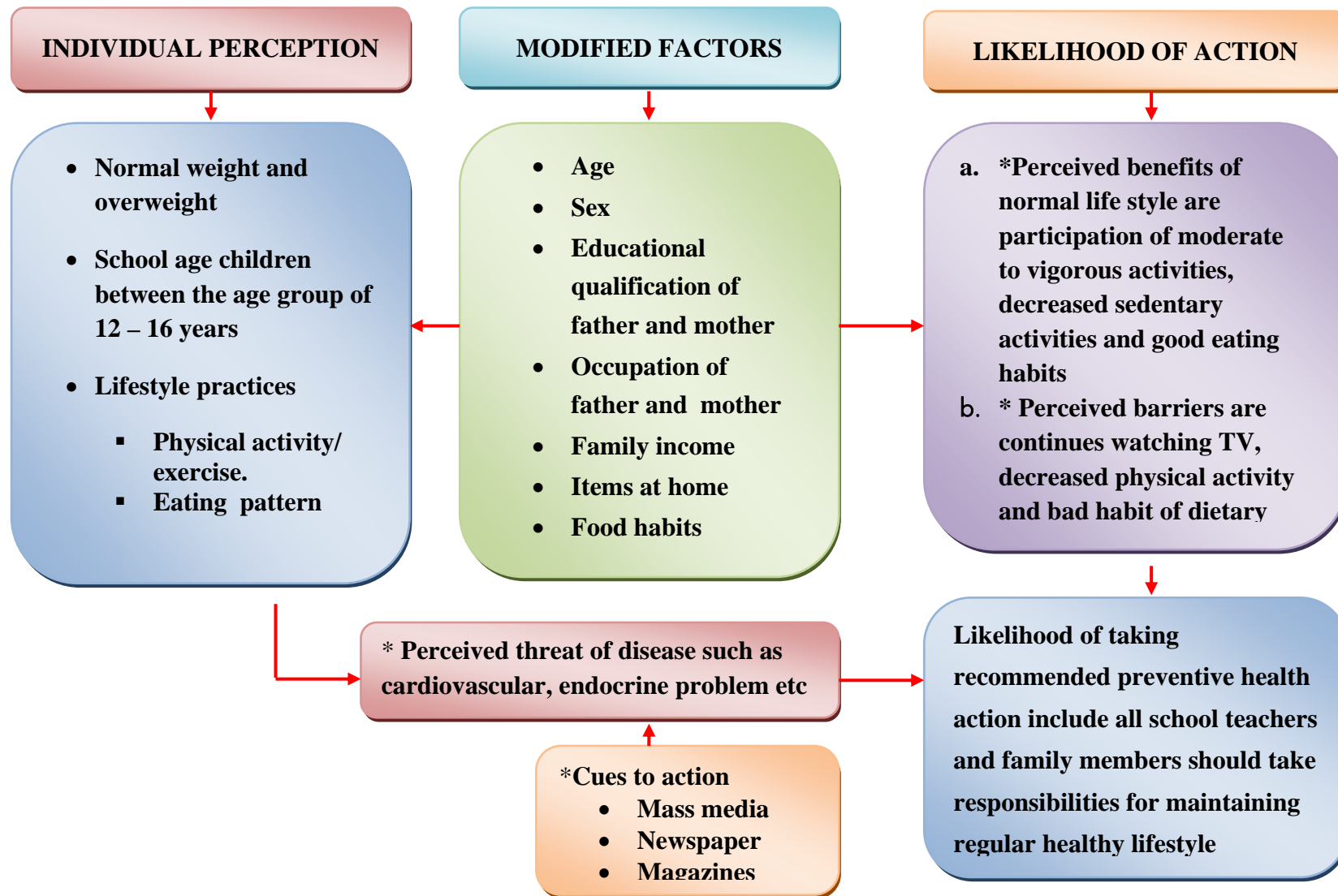


Fig-1 Conceptual Model based on Rosenstoch's, Becker and Maimans's "Health Belief Model"
 * excluded from the study

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

Review of literature is a systematic identification or scrutiny and summary of written materials that contain information on research problems. This chapter presents the related literature relevant to the problem under study.

Literature regarding lifestyle practice and overweight.

S Kumar et al. (2007) conducted a study to assess the prevalence of obesity and its influencing factor among school children. A Cross sectional study followed by a case control study was conducted in two schools of Davangere city India. A total of 1496, school children studying between 5th and 10th standard aged between 10 and 15 years were enrolled. Data on family history of obesity, diet, snacking habits and physical activity was collected. The result shows that prevalence of obesity was more in girls (8.82%) than boys (4.42%). Family history of obesity, snacking of high energy foods and lack of physical activity were the important influencing factors of obesity.

Ashlesha Datar, Rolond Sturm and Jennifer L. Magnabosco (1998) conducted a longitudinal study in California U.S on childhood overweight and academic performance, a national study of kindergartners and first graders. The data analyzed consisted of 11,192 first time kindergartners from early childhood. Multivariate regression technique were used to estimate the independent association of overweight status with childrens math and reading standardized test scores. The result showed overweight children had significantly lower math and reading test scores compared with non overweight children.

Annemarie Koster, Brenda W.J.H et al. (2001) conducted a study on “lifestyle factors and incident mobility limitation in obese and non-obese older adults”. This study examined the association between incident mobility limitation and 4 lifestyle factors: smoking, alcohol intake, physical activity and diet. Random method was used in this study. The data were collected from men and women of 70 to 79 years of age from Pittsburgh, PA, and Memphis, participating in the Health, Aging and Body Composition study. The results showed obese/overweight persons had a significantly higher risk of mobility limitation compared with non obese persons, independent of lifestyle factors.

Marion. F. Zabinski, Brian & Saelens A.K (2003) conducted a study on overweight children’s barriers to and support for physical activity compared with non overweight children. Barriers and support for physical activity were examined among 84 overweight children attending a summer fitness camp. Random method was used in this study. Barriers and support levels were compared with those of 80 non overweight children. The results showed that overweight children, particularly girls, reported significantly higher body related resource and social barriers to physical activity compared with non overweight children and lower levels of adult support for physical activity.

The National Health and Nutrition Examination Survey (1999-2002) used, a stratified multistage probability sample and collected a broad array of data from a nationally representative sample of US citizens. All children 3 – 17 years old were included in this sample and they were categorized as at risk for overweight or greater (>85%) or overweight (>95%) and household & childhood security/insecurity using the US food security scale. The results showed when compared with children from food-secure households, children from food insecure households were more likely to demonstrate significant associations with being at risk for overweight. Gender, age & family poverty index level, childhood food insecurity is associated with a child being at risk for overweight status as greater.

Avula Laxmaiah et al. (1997) conducted a study on factors affecting prevalence of overweight among schoolchildren in Hyderabad, India. The objective of the study

was to assess the prevalence of overweight and obesity. A cross-sectional and institutional study, adopted a multistage stratified cluster sampling procedure was carried out in this study on adolescents 12 to 17 years of age of both sexes. The findings emphasized that regular physical exercise, doing household activities, regular physical exercise and healthy eating behavior could contribute to controlling overweight. The major conclusion drawn from this study is that physical inactivity, regular TV watching, and overeating contributes to overweight. Low level of physical activity, watching TV & consuming junk foods are associated with a high prevalence of overweight.

Diane berry, Marry Saroye et al (2007) conducted an experimental study on “Multiethnic obese parents and overweight children at a middle school in United States. A total sample of 80 parent child dyads were inducted into the study. The purpose of this study was to determine the effects of the addition of copying skills training for obese multiethnic parents whose overweight children were attending a weight management program. All children and parents received the nutrition and exercise program (NEEP). All children received formal exercise and behavior modification, and all parents were encouraged to do exercise. Only the parents in the experimental group received communication skills training (CST). At 6 months, parents in the experimental group had significantly low BMI and body fat percentage (BFP) and high number of pedometer steps compared with those in the control group. Parents in the experimental group also demonstrated significant improvement in interpersonal relationship, behavior control and stress management. Children in the experimental group demonstrated trends towards decreased Body Mass Index and Body fat percentage and used pedometer steps.

Raman K Marwaha et al (2006) conducted a study on Growth Parameters and prevalence of overweight and obesity in school children from Delhi. A cross sectional approach was used in this study in Government and private schools in Delhi. A total of 8840 (3566 boys, 5274 girls) from Government school and 12645 (6197 boys, 6448 girls) from private school formed the sample for this study. The subjects underwent assessment of height and weight calculation of Body Mass Index. Prevalence of overweight and obesity was assessed and compared between the two socio economic groups. The results showed that a significant difference was noted in height, weight, and

Body Mass Index between low socio economic groups and upper socio economic groups. The prevalence of overweight and obesity in upper socio economic status was 16.75% and 5.59% in boys and 19.01% and 5.03% in girls.

Gary S. Goldfield, Risa Mallory et.al (2007) conducted a study on effects of modifying physical and sedentary behavior on psychosocial adjustment in overweight/obese children. Thirty samples (13 boys, 17 girls) between 8-12 years of overweight/obesity children participated in this study A randomized controlled trail design was used. Results showed that, increases in Physical activity were associated with increases in perceived physical conditioning, body satisfaction, overall physical self-worth independent of changes in body mass index. Reductions in TV viewing were also related to increased physical activity.

Gareth Stratton, Nicola D Ridgers (2007) conducted a study on physical activity levels of normal weight and overweight girls and boys during primary school recess. This study aimed to compare moderate to vigorous activity (MVPA) and vigorous physical activity (VPA) in normal weight & overweight boys & girls during recess. Four hundred twenty children, age 6-10 years were randomly selected from 25 schools in England. Three hundred seventy-seven children completed the study. Body Mass Index was calculated from height and weight measurements, and heart rate reserve threshold of 50% and 75% reflected children's engagement in moderate vigorous physical activity and vigorous physical activity, respectively. Results showed that, normal weight girls were the less active group, compared with overweight boys and girls who were equally active. Fifty one boys and 24 girls of normal weight achieved the 40% threshold; of these, 30 boys and 10 girls exceeded 50% of recess time in moderate vigorous physical activity. Eighteen overweight boys and 22 overweight girls exceeded the 50% threshold.

Tebb, S.A and M.S. Moore (1999) conducted a study to assess the contribution of a sedentary lifestyle and inactivity to the etiology of overweight and obesity; current evidence and research issue. The data from etiological, cross sectional and prospective studies that had assessed physical activity and dietary intake and their relationship to

bodyweight were reviewed. The results imply that the increase in the prevalence of obesity is more strongly related to lower levels of physical activity than high energy intakes. There is some evidence that both a high proportion of dietary fat and low levels of physical activity may increase the likelihood of weight gain.

Rebecca Kuriyan et al (2007) conducted a study to associate television viewing and sleep pattern with overweight children among urban and semi urban South Indian children. A cross sectional Questionnaire based on 598 children aged 6-16 years (male and female) recruited from children visiting St. Johns Medical College Bangalore for vaccination and minor complaints. These children were studied for their physical activity pattern, sleep duration, sedentary habits and eating behavior. The results showed that decreased duration of sleep and increased TV viewing were significantly associated with overweight children. Among the eating behavior, increased consumption of fried foods was significantly associated with overweight children.

CONCLUSION

From the literature review it is quite evident that normal weight children were engaged in more physical activity and normal eating pattern as compared to overweight children. The literature review supported to organize the present study and construct the tool appropriately to compare the lifestyle of normal weight and overweight children.

METHODOLOGY

CHAPTER III

METHODOLOGY

Research methodology is a way to systematically solve the research problem. This chapter explain the methodology adopted by the researcher to access the lifestyle of school children with overweight and normal weight. It deals with research design variables under study, settings of the study, population, sample size, sampling technique, criteria for selection of sample, development of tool, pilot study and data collection procedure.

RESEARCH APPROACH

A descriptive study is to observe, describe and document aspects of a situation as it naturally occurs. The comparative study explain the difference in two groups. (Polit & Hungler).

A descriptive and comparative survey approach was considered the best to assess the physical activity/exercise and eating pattern of normal weight and overweight school going children.

RESEARCH SETTING

The study was conducted in RVS Matriculation School which is located in Suler, Coimbatore, which has adequate facilities to provide education upto 12th standard. The total strength of the school was 1306. Students are motivated to do all curricular and extra curricular activities in the school. There are two physical educators working in this institution. Students are getting games period 1to 3 times in a week. Those who are studying in this institution come from middle to high class family. Nearby the school fast food shops are available.

POPULATION

The population for this study included 514 school children from 7th to 11th standard of RVS Matriculation School at Coimbatore. It included normal weight and overweight children.

SAMPLE SIZE

The sample size for the present study was 50 children, 25 children with overweight and 25 children with normal weight from 7th to 11th standard of the selected Matriculation school.

SAMPLING METHOD/ TECHNIQUE

A non-probability convenience sampling technique was used to select the samples. According to Body Mass Index classification the samples are classified into Normal weight and Overweight children.

SAMPLING CRITERIA

The following were the criteria for selection of samples in the study.

Inclusion Criteria

- ❖ School children of both sex.
- ❖ Overweight and normal weight school children who were studying in 7th to 11th standard.
- ❖ Those who are willing to participate.

Exclusion Criteria

- ❖ Children aged more than 16 years
- ❖ Children who were physically handicapped.

DESCRIPTION OF TOOL

The tool used for this study was a structured questionnaire with 2 parts.
(Refer Appendix vi)

Part I: Consisted of selected demographic variables such as age, educational qualification of father and mother, occupation of father and mother, family income, items at home, family food type and items.

Part II: This part was developed to assess the lifestyle of samples in relation to physical activities and eating pattern.

A) Physical activity/exercise:

This part of the tool were consisted of 15 multiple response questions. All questions were used to know the type, frequency and duration of physical activities in and out of school and mode of travel to school and for other purposes (visiting friends, shopping)

The 1-3 questions were used to determine the type, frequency and duration of physical activity during games period at school, 4th and 5th question were focused at school, 6th-10th question were used to assess the type, frequency and duration of physical activities at home. The 11th and 12th questions were used to know the type, frequency and duration of physical exercises. The mode of travel to school and for other purposes (visiting friends and shopping) were determined by question number 13 to 15.

B) Eating pattern.

This part consisted of 11 multiple response questions to know the eating pattern of samples.

Question number 16 to 18 were used to found the skipping of food and to know the pattern of meal question number 19 were used. Question number 20 and 21 were used to know the types of snacks taken by the samples while watching television. Question number 22 to 26 were giving information regarding pocket money, type and frequency of taking fried items, fast food, sweets and soft drinks beverages.

SCORING

Good habit of school children on eating pattern was scored 2 marks and poor habit of school children on eating pattern was scored 1 mark.

S. No	Eating pattern	Score		
		3	2	1
1	Breakfast	-	Everyday	Not everyday
2	Snacks	-	Everyday	Not everyday
3	Dinner	-	Everyday	Not everyday
4	Packed lunch	-	Everyday	Not everyday
5	Meal pattern	-	2 to 3 meals per day	Four and more than 4 meals per day
6	Eating snacks while watching television	-	No	Yes
7	Pocket money	-	No	Yes
8	Frequency of taking items and snacks	Less than 3 times a week	Greater than 3 times a week	Daily
9	Frequency of taking soft drinks beverages	Less than 3 times a week	Greater than 3 times a week	Daily

SCORING INTERPRETATION

Score	Level of Habit
1 – 14.5	Poor
15-20	Good

DEVELOPMENT OF THE TOOL

The tool was developed based on the objectives of the study, review of literature and discussion with experts.

CONTENT VALIDITY

Content validity refers to the degree to which an instrument measures what it is intended to measure (Polit and Hungler-1999).

In order to establish the content validity, the tool was given to 2 nursing experts, 1 nutritionist and two medical experts.

The two nursing experts were Masters in Nursing with Child Health Nursing Specialization and with 5-6 years of experience, one working as the Head of the Child Health Nursing Department and the other as Associate Professor in a college of nursing at Coimbatore. The nutritionist was a M.Phil in Food and Nutrition, with 12 years of experience working as a Head of Nutrition Department in R.V.S College of Nursing, at Coimbatore.

The medical experts were a Consultant Pediatricians with 15 years of experience and holding Charge of Masonic Children Hospital and RVS Multi-Specialty hospital in Coimbatore.

RELIABILITY

The reliability of the tool was established by the test retest method. The tool was administered to ten samples. The retest was given after a gap of 7 days. The reliability was checked by **Karl Pearson's** correlation coefficient method. The 'r' value was 0.89 which suggested a high reliability and stability of the instrument.

PILOT STUDY

In order to find out the practicability and feasibility of the tool, pilot study was carried out by obtaining prior permission from the Principal and class teacher of 7th standard which was selected for the main study, R.V.S Matriculation School. For the pilot study 5 normal weight and 5 overweight school children were selected based on their Body Mass Index value (World Health Organization 2004) and who met the inclusion criteria. Samples were selected by convenience sampling method.

The class teacher arranged one room for filling the questionnaire. The purpose of the study was individually explained to the samples by the investigator and questionnaire was given with a request to fill and it return after filling the questionnaire and not to share the information's with any other. The investigator personally collected the filled questionnaire. Both groups of children found it easy to fill the questionnaire. Hence no modification was required in the tool & technique.

DATA COLLECTION PROCEDURE

Before commencing the data collection permission was obtained from the Principal and class teachers from 7th to 11th standard of R.V.S Matriculation School, Coimbatore for conducting the main study.

The investigator selected 25 normal weight and 25 overweight children on the basis of Body Mass Index value (World Health Organization 2004) and who met the inclusion criteria. All sample were selected by convenient sample method.

The investigator contacted the children both overweight & normal weight school children personally and established support by engaging in informal talk. The purpose of the study was explained and obtained their willingness. The class teacher arranged one room for filling the questionnaire according to the free time and the class teachers convenience they have allowed time for the investigator for conducting the study and the investigator personally given the questionnaire to the samples with the request to fill and return after filling the questionnaire and given the instruction that not to share the information with any other. The investigator personally collected the filled questionnaire. The study was done from 29.06.2009 to 29.07.2009. During this period the investigator stayed in the school from 9am to 4pm.

DATA ANALYSIS

The responses collected from the respondents were edited and tabulated. The data was analyzed using descriptive statistics and inferential statistics.

Descriptive Statistics (Frequency, Percentage)

The data was analyzed by using frequency and percentage to describe Demographic variables. It was used to assess the physical activities in and out of school, physical exercises and eating pattern adopted by both normal weight and overweight children.

Inferential Statistics

Chi square was used to assess the association of physical activities/exercise with normal weight and overweight children and 't' test was used to assess the level of significant difference of eating habits.

DATA ANALYSIS

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

James A Fain (2003) defines data analysis as the systematic organization and synthesis of research data and the listing of research hypothesis using those data.

Abdullah and Levin (1979) have stated that interpretation of tabulated data can bring to light the real meaning of the findings of a study.

This chapter deals with the analysis and interpretation of data collected from 25 normal weight and 25 overweight children from R.V.S Matriculation Higher Secondary School.

The data have been analyzed and presented comparatively for normal weight and overweight children under the following headings.

1. Demographic characteristics of normal weight and overweight children.

Demographic characteristics such as age of the child, sex, education and occupation of father and mother, family income, items at home and food habits of family.

2. Distribution of samples based on Body Mass Index

3. Lifestyle among normal weight and overweight children.

Lifestyle has been analyzed in two categories. Analysis of physical activity/ exercise for the normal weight and overweight children in frequency and percentage and analysis of dietary pattern for the normal weight and overweight children in frequency and percentage.

4. Data on comparison between normal weight and overweight children on physical activity / exercise and dietary pattern.

TABLE – I (a)

**FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT
AND OVERWEIGHT CHILDREN BASED ON DEMOGRAPHIC
CHARACTERISTICS**

N=50

S. No	Demographic characteristics	Normal weight N = 25		Over weight N = 25	
		F	%	F	%
1	Age				
	12 – 13	5	20.0	6	24.0
	13 – 14	12	48.0	10	40.0
	14 – 15	5	20.0	5	20.0
	15 – 16	3	12.0	4	16.0
2	Sex				
	Male	14	56.0	17	68.0
	Female	11	44.0	8	32.0
3	Items at home				
	1. Computer	7	28.0	15	60.0
	2. Television	25	100.0	25	100.0
	3. Car	5	20.0	6	25.0
	4. Bike	18	72.0	23	92.0
	5. Cycle	24	96.0	24	96.0
	6. Exercising equipments	1	4.0	8	32.0
4	Food habits				
	1. Vegetation	2	8.0	1	4.0
	2. Occasionally non-vegetarian	21	84.0	19	76.0
	3. Mostly non-vegetarian	1	4.0	2	8.0
	4. Ovo vegetarian	1	4.0	3	12.0
5	Food intake of family				
	1. Cereals	25	100.0	25	100.0
	2. Pulses	25	100.0	25	100.0
	3. Vegetables	25	100.0	25	100.0
	4. Milk and milk products	25	100.0	25	100.0
	5. Sweets	25	100.0	25	100.0
	6. Non vegetarian	23	92.0	25	100.0

Table I (a) presents the demographic characteristics of both normal weight and overweight.

Age

Distribution of samples based on age was similar for both the categories. Twenty percentage of the normal weight children and 24% of the overweight children were between 12-13 years of age. Forty eight percentage of the normal weight children as well as 40% of overweight children were in the group of 13-14 years. Twenty percentage of normal weight and 20% of overweight children were from 14-15years of age and 12% of normal weight and 16% of overweight children were between 15-16%.

Sex

Based on sex majority of samples (56% of normal weight and 68% of overweight) were male and only 44% of normal weight and 32% of overweight children were female.

Items at home

Both normal weight and over weight (100%) children were having television at home. Majority (96%) of normal weight and overweight children were having cycle, 72% of normal weight children and 92% of over weight children were having bike. Sixty percentage of overweight and 28% of normal weight children were having computer at home. Twenty five percentage of overweight and 20% of normal weight children were having car. Only 32% of overweight children and 4% of normal weight children were having exercise equipments at home.

Food habits

Majority of normal weight (84%) and overweight children (76%) were occasionally non vegetarian. Very few normal weight (8%) and overweight children (4%) were vegetarian. Eight percentage of normal weight and 20% of overweight children were non vegetarian and ovo vegetarian.

Food intake of the family

All the normal weight and overweight children were taking cereals, pulses, vegetables, milk and milk products and sweets. Majority of normal weight (92%) and overweight children (100%) were taking non vegetarian foods.

TABLE – I (b)

**FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT
AND OVERWEIGHT CHILDREN BASED ON DEMOGRAPHIC
CHARACTERISTICS**

N = 50

S. No	Demographic characteristics	Normal weight N = 25		Over weight N = 25	
		F	%	F	%
1	Educational qualification				
	Father				
	Primary	1	4.0	0	0
	Middle	6	24.0	5	20.0
	Secondary	7	28.0	4	16.0
	Graduate	11	44.0	16	64.0
	Mother				
	Illiterate	1	4.0	0	0
	Primary	3	12.0	2	8.0
	Middle	7	28.0	6	24.0
	Secondary	11	44.0	3	12.0
Graduate	3	12.0	14	56.0	
2	Occupation				
	Father				
	Professionals	9	36.0	11	44.0
	Self employers	12	48.0	9	36.0
	Govt. employers	3	12.0	2	8.0
	Private sector employers	1	4.0	2	8.0
	Other				
	Mother	0	0	1	4.0
	Working	3	12.0	16	64.0
Nonworking	22	88.0	9	36.0	
3	Family income				
	5001 – 10,000	9	36.0	3	12.0
	Above 10,000	16	64.0	22	88.0

Table I (b) presents the demographic characteristics of both normal weight and overweight.

Educational qualification

Father

Majority of fathers of normal weight children (44%) and over weight children (64%) were graduate. Twenty eight percentage fathers of normal weight children and 16% overweight children had secondary education. Twenty four percentage fathers of normal weight and 20% fathers of overweight children had middle school education. Four percentage fathers of normal weight children had primary education.

Mother

Only 12% of mothers of normal weight children and 8% of mothers of overweight children had primary education. Twenty eight percentage of mothers of normal weight and 24% mothers of overweight children had middle school education. Majority of mothers of normal weight children (44 %) and only 12% of mothers of overweight children had completed secondary school education. Majority (56%) mothers of overweight children had graduate and 12% in normal weight children.

Occupation

Father

Forty eight percentage fathers of normal weight and 36% of fathers of overweight children were self employers. Majority (44%) of fathers of overweight children and 36% of fathers of normal weight children were professionals. Twelve percentage fathers of normal weight and 8% of fathers of overweight children were Government employees. Four percentage fathers of normal weight and 12% fathers of overweight children were working in private sector.

Mother

Majority (64%) of mothers of overweight children were working and only 12% of them of normal weight children. In the normal weight children majority (88%) of mothers were nonworking compared to only 32% of mothers in overweight categories

Family income

Majority of the families (88 %) of overweight children and 64 % normal weight children had income level above Rs.10, 000. Only 36 % of families of normal weight children and 12 % of overweight children had income level between Rs.5, 000 to 10,000.

TABLE – II

**FREQUENCY AND PERCENTAGE DISTRIBUTION OF SAMPLES BASED
ON BODY MASS INDEX**

N = 50

S. No	Weight Category	Classification	Frequency	Percentage	Average
1	Normal weight	17.5 – 20	10	20.0	20.64
		20 – 22.5	10	20.0	
		22.5 – 25	5	10.0	
2	Over Weight	25 – 27.5	16	32.0	26.80
		27.5 – 30	9	18.0	

Table II presents distribution of samples based on Body Mass Index

Among normal weight children majority (40 %) had Body Mass Index value between 17.5 to 22.5. The average Body Mass Index value of normal weight children was 20.64.

Majority (32 %) of overweight children had Body Mass Index value between 25 to 27.5. The average Body Mass Index value for overweight children was 26.8.

Fig - 2 shows frequency and percentage of samples based on Body Mass Index

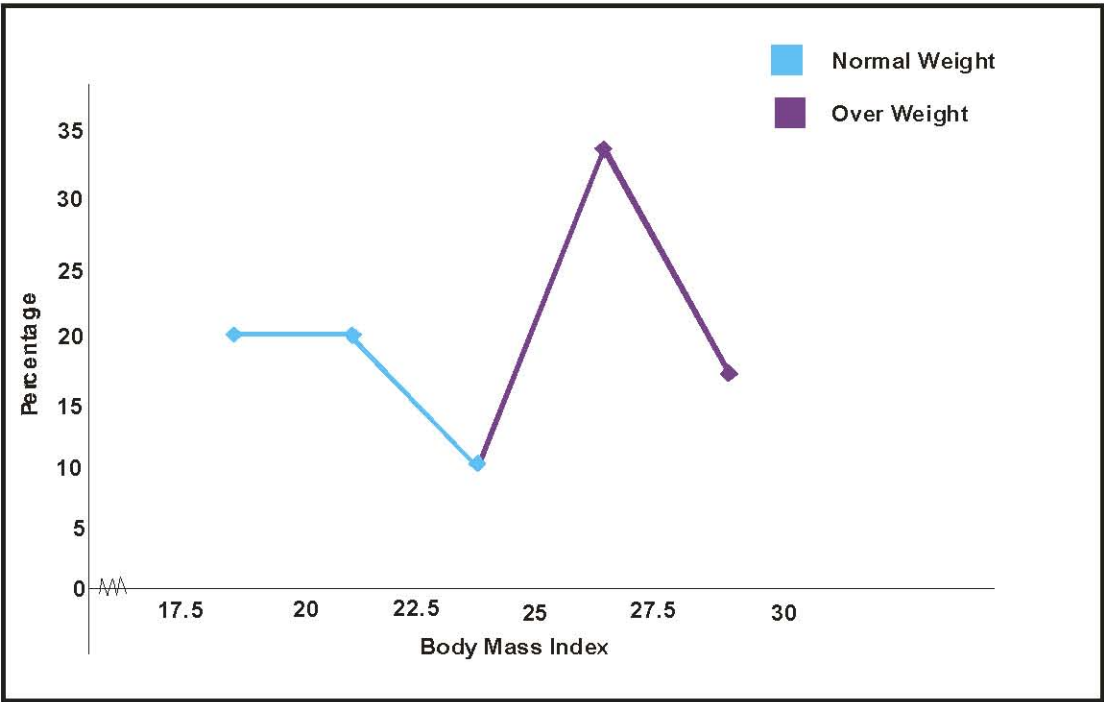


Fig- 2 Frequency and percentage of samples based on Body Mass Index

TABLE – III

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN IN THREE CATEGORIES OF PHYSICAL ACTIVITY DURING GAMES PERIOD AT SCHOOL

N=50

S. No	Categories of Activity	Normal Weight N = 25		Over Weight N= 25	
		F	%	F	%
1	Moderate Activity	5	20.0	1	04.0
2	Vigorous Activity	16	64.0	8	32.0
3	Moderate and Vigorous Activity	4	16.0	16	64.0

Table III presents the physical activity of normal weight and overweight children in 3 categories during games period.

During games period 16 normal weight children (64%) engaged in vigorous activities such as Basketball, Football, Tennis, Cricket, Badminton and Volleyball. Five children (20%) engaged in moderate activity like ring ball and 4 children (16%) engaged in moderate and vigorous activities.

Though overweight children were also engaged in all the three categories of activities during games period, the number of children who engaged in these activities was very less. One child (4%) engaged in moderate activity and number of children who engaged in both moderate and vigorous activities were more among overweight children 16 (64%) and 4 (16%) among normal weight children.

This table concludes that both normal weight and overweight children were engaged more or less in the same manner in all the three categories of physical activities during games period.

Fig - 3 presents the three categories of physical activities of normal weight and overweight children.

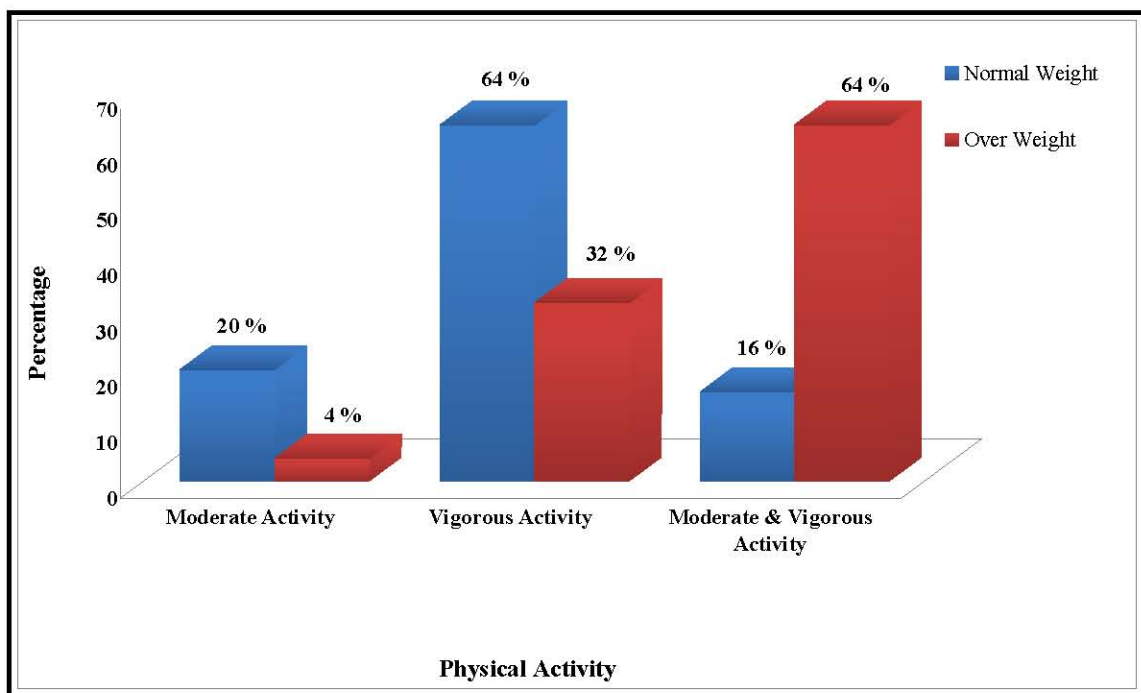


Fig- 3 The three categories of physical activities of normal weight and overweight children

TABLE – IV

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN IN THREE CATEGORIES OF PHYSICAL ACTIVITY WHILE AT SCHOOL

N=50

S. No	At School	Categories of Activity	Normal Weight N = 25		Over Weight N= 25		χ^2 P 0.05 df 1
			F	%	F	%	
1	Before school begins	Vigorous Activity	11	44.0	-	-	2.65^{ns}
2	During lunch	Moderate Activity	1	4.0	2	8.0	
		Vigorous Activity	9	36.0	6	24.0	
3	After school is over	Moderate Activity	1	4.0	1	4.0	
		Vigorous Activity	18	72.0	4	16.0	

ns – not significance df- degree of freedom

Table value 3.84

Table IV presents the physical activities of normal weight and overweight children while at school.

Physical activity is seen among school children before school begins, during lunch and after school is over. Eleven (44%) normal weight children were engaged in vigorous activities such as football, tennis, throw ball, basketball and badminton before school begins.

Vigorous activities were seen among 9 (36%) and 18 (72%) of normal weight children during lunch and after school was over. Comparatively vigorous activity during

lunch hour and after school was over was seen only among 6 and 4 overweight children (24-16%). Moderate activity during lunch and after school was seen only among 1-2 children of both the groups.

It appears that normal weight children engage more in vigorous activities than overweight children while at school.

From the table it was noted that there was no significant difference between the two categories of physical activity during lunch and after school is over among normal weight and over weight children.

Fig - 4 presents the percentage of normal and overweight children in 3 categories of physical activity while at school

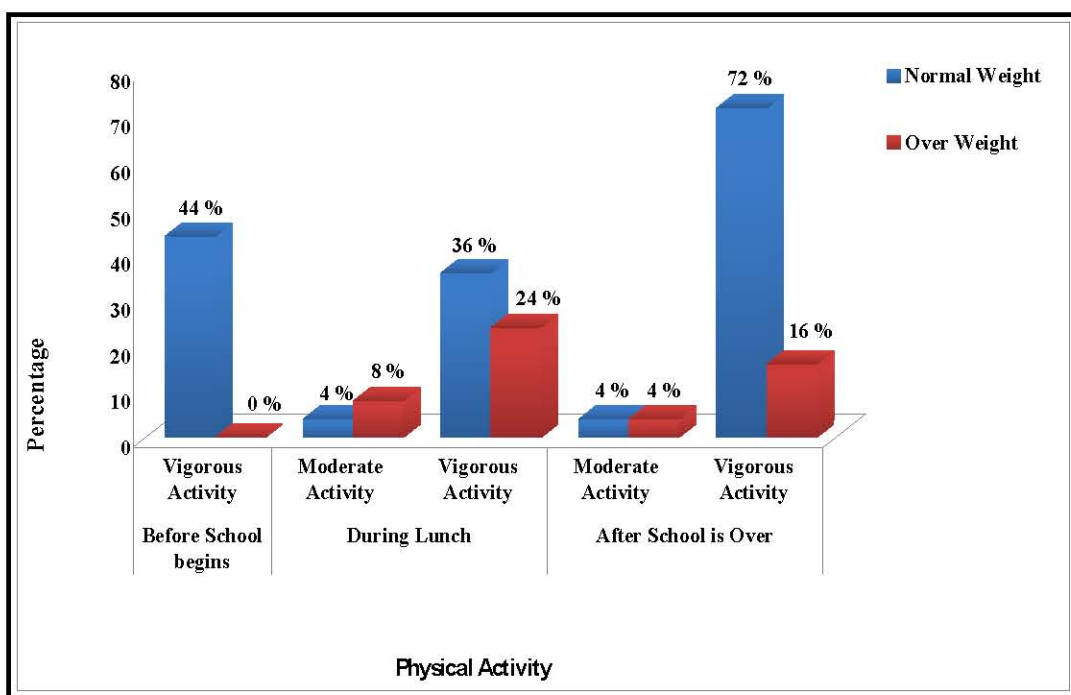


Fig- 4 Percentage of normal weight and overweight children in 3 categories of physical activity while at school

TABLE – V

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN ACCORDING TO THE CATEGORIES OF PHYSICAL ACTIVITY AFTER RETURNING FROM SCHOOL

N = 50

S. No	At Home	Normal Weight N = 25		Over Weight N= 25	
		F	%	F	%
1	Indoor Games Light Activities	3	12.0	3	12.0
2	Outdoor Games Moderate Activities	2	8.0	2	8.0
	Vigorous Activities	2	8.0	2	8.0
	Moderate and vigorous activity	2	8.0	2	8.0
3	Indoor and Outdoor Games	11	44.0	5	20.0

Table V presents the categories of physical activity while at home.

After returning from school 6 normal weight children (24%) engaged in outdoor games such as basketball, cricket, football, kho-kho, volleyball and ring ball, 3 children (12%) engaged in Indoor games such as chess, caroms, cards and videogames and 11 children (44%) engaged in indoor and outdoor games.

Similarly overweight children engaged in all these three categories of activities after returning from school. Four children (16%) engaged in outdoor games such as cricket, football, basketball and shuttle, 3 children (12%) engaged in indoor games such as videogames, chess, cards and caroms and 5 children (20%) were engaged in indoor and outdoor games.

This table concludes that majority of normal weight children were engaged in outdoor and indoor and outdoor games as compared to overweight children. More or less both normal weight and overweight children were engaged in indoor games.

TABLE – VI

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVER WEIGHT CHILDREN ACCORDING TO CATEGORIES OF PHYSICAL ACTIVITY DURING WEEKEND AND HOLIDAYS

N = 50

S. No	Activity	Normal Weight N = 25		Over Weight N= 25		χ^2 P 0.05 df 3
		F	%	F	%	
1	Vigorous activity	8	32	1	4	9.24^{ns}
2	Moderate activity	3	12	5	20	
3	Light activity	6	24	16	64	
4	Vigorous and Moderate activity	8	32	3	12	

ns – not significance df-degree of freedom

Table value 7.82

Table VI presents the categories of games played during weekend and holidays

During weekend and holidays 8 normal weight children (32%) were engaged in vigorous activities such as basketball, football, tennis, cricket and volleyball. Three children (12%) engaged in moderate activities such as ring ball and hide and seek. Six children (24%) engaged in light activities such as caroms, chess and videogames and 8 children (32%) engaged in vigorous and moderate activities.

Comparatively vigorous activity, vigorous and moderate activity were seen only among 4 (16 %) overweight children as against 16 normal weight children. Moderate activity was seen more among over weight children (20%) where as it was seen only upto 12% normal weight children. Interestingly light activity was seen more among over weight children 16 (64 %).

There was a significant difference noted between the types of physical activity among normal weight and over weight children during weekend and holidays. (df 3, CV 9.24, TV 7.82)

Fig - 5 shows percentage of normal and over weight children in categories of physical activity during weekend and holidays

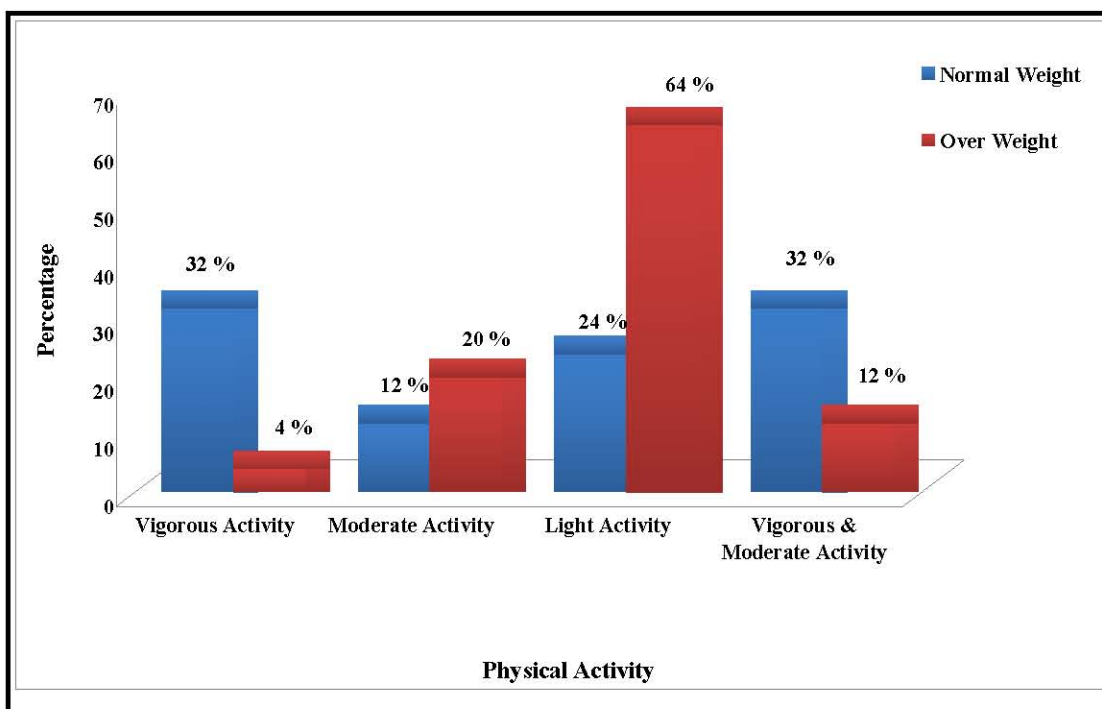


Fig- 5 Percentage of normal weight and over weight children in categories of physical activity during weekend and holidays

TABLE – VII

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN ACCORDING TO TYPES OF PHYSICAL EXERCISES

N = 50

S. No	Activities	Normal Weight N = 25		Over Weight N= 25		χ^2 P 0.05 df 6
		F	%	F	%	
1	Walking	21	84.0	9	36.0	1.17^{ns}
2	Swimming	4	16.0	1	4.0	
3	Jogging	7	28.0	5	20.0	
4	Gymnastic	3	12.0	0	0.0	
5	Yoga	5	20.0	1	4.0	
6	Bicycle	24	96.0	17	68.0	
7	Dancing	7	28.0	2	8.0	
8	Karate	4	16.0	3	12.0	

ns – not significance df-degree of freedom

Table value 14.07

Table VII presents the type of physical exercises.

Physical exercises such as walking and bicycling were seen among 21-24 (84 – 96%) normal weight children. In all other activities which was moderate, vigorous type such as Swimming, Jogging Gymnastic Dancing and Karate 3-7 normal weight (12-28 %) children were engaged.

In contrast, in walking 9(36 %) and bicycling 17(68 %), of the overweight children participated. Only 1-5 overweight children (4-20 %) engaged in all other activities.

This table clearly shows that normal weight children engaged more in all forms of physical exercise compared to over weight children

There was no significant difference noted between the types of physical exercise among normal weight and over weight children

Fig - 6 shows percentage of normal weight and overweight children according to types of physical exercises

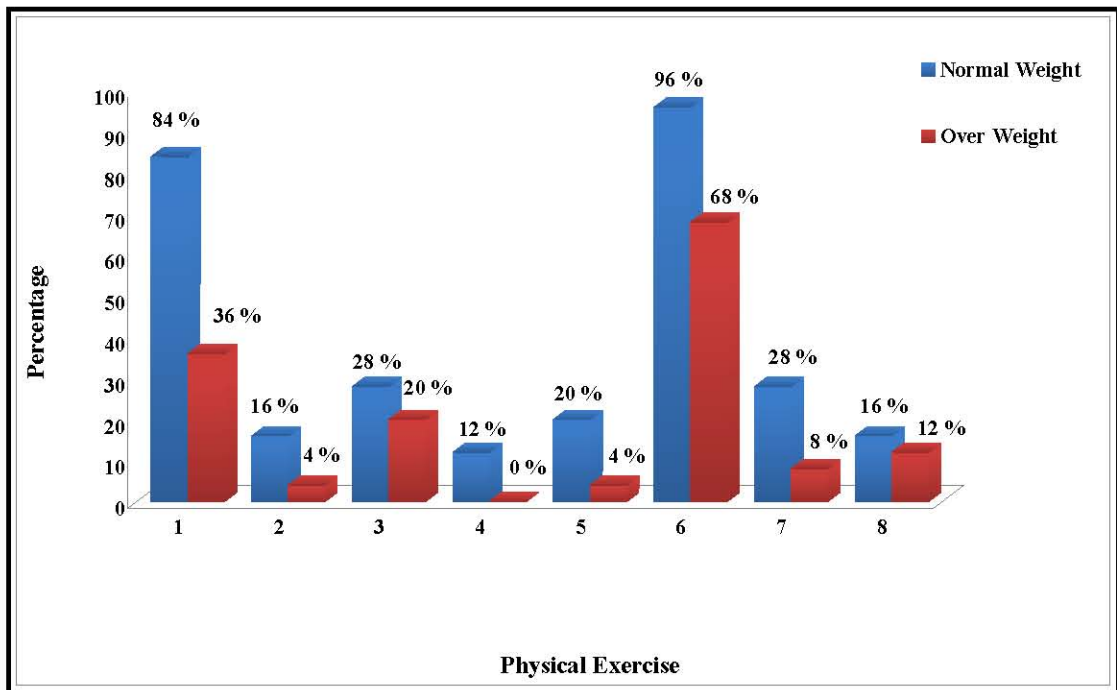


Fig-6 Percentage of normal weight and overweight children according to types of physical exercises

S. No	Exercise
1	Walking
2	Swimming
3	Jogging
4	Gymnastic
5	Yoga
6	Bicycle
7	Dancing
8	Karate

TABLE – VIII

**FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT
AND OVER WEIGHT CHILDREN ACCORDING TO SEDENTARY
ACTIVITIES AFTER RETURNING FROM SCHOOL**

N = 50

S. No	Activities	Normal Weight N = 25		Over Weight N= 25		χ^2 P 0.05 df 7
		F	%	F	%	
1	Watching TV	5	20.0	16	64.0	0.67^{ns}
2	Using Computer	2	4.0	8	32.0	
3	Listening Music	5	20.0	16	64.0	
4	Doing Home Work	5	20.0	16	64.0	
5	Reading Book	5	20.0	13	52.0	
6	Going for Tuition	3	12.0	9	36.0	
7	Chitchatting with Family Members	3	12.0	14	56.0	
8	Chitchatting with Friends	2	8.0	12	48.0	

ns – not significance df-degree of freedom

Table value 14.07

Table VIII presents the sedentary activities after returning from school

After returning from school 5 normal weight children (20%) engaged in sedentary activities such as watching TV, listening music, doing homework and reading books. Only 2-3 normal weight children (4-12 %) engaged in activities such as going for tuition, chitchatting with family members and friends and using computers.

In contrast 16(64%) overweight children were engaged in watching TV, listening music and doing home work. Reading books, chitchatting with family members and friends, was seen more among overweight children (56% and 48%). Going for tuition,

using computers also were seen more among overweight children (36and32% respectively).

This table concludes that overweight children engage more in sedentary activities compared to normal weight children.

There was no significant difference noted between the type of sedentary activities after returning from school among normal weight and over weight children.

Fig - 7 shows percentage of normal and overweight children according to sedentary activities after returning from school

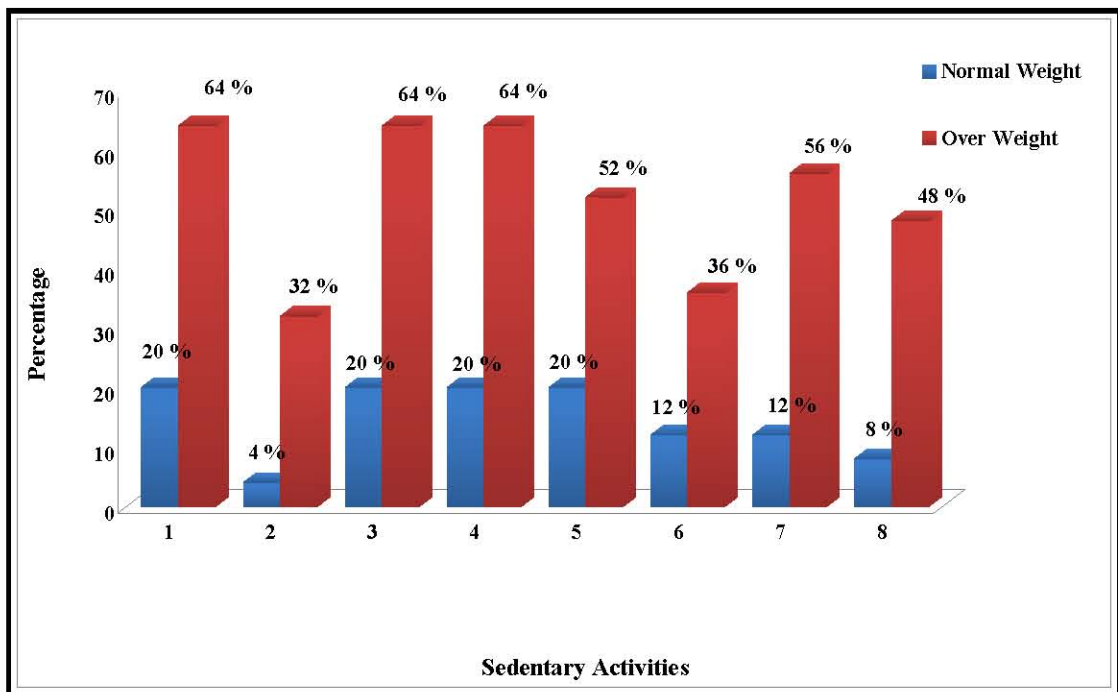


Fig-7 Percentage of normal and overweight children according to sedentary activities after returning from school

S. No	Exercise
1	Watching TV
2	Using Computer
3	Listening Music
4	Doing Home Work
5	Reading Book
6	Going for Tuition
7	Chitchatting with Family Members
8	Chitchatting with Friends

TABLE – IX

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN ACCORDING TO MODE OF TRAVEL

N =50

S. No	Mode of travel	Normal Weight N = 25		Over Weight N= 25		χ^2 P 0.05 df 3
		F	%	F	%	
1	<u>To school</u>					6.852 ^{ns}
	Walk	10	40.0	2	8.0	
	Auto/ car/ school bus/ bike	7	28.0	7	28.0	
	Private bus	2	8.0	2	8.0	
	Bicycle	6	24.0	14	56.0	
2	<u>Other purpose</u>					20.372 [*]
	Walk	17	68.0	1	4.0	
	Auto/ car/ school bus/ bike	1	4.0	9	36.0	
	Private bus	3	8.0	2	8.0	
	Bicycle	5	20.0	13	52.0	

Table value 7.82

* - significance , df-degree of freedom ns – not significance

Table IX presents the mode of travel to school and for other purpose.

Majority of the normal weight children (40 %) were going to school by walking, 24% by bicycling and rest by auto/ car/ school bus/ bike and private bus. For other purposes such as shopping and visiting friends, majority (68%) of normal weight children preferred walking, 20 % children went by bicycling and only 4 - 8 % of children went by auto/ car/ school bus/ bike and private bus.

Whereas majority (56%) of overweight children went to school by bicycle. Thirty six percentage of overweight children went to school by auto/ car/ school bus/ bike and private bus and only 8% went by walking.

This table concludes that for school or for other purposes, walking was common mode of transport for majority of normal weight children compared to overweight children.

There was no significant difference noted between the mode of travel to school among normal weight and over weight children.

There was a significant difference noted between the mode of travel for other purposes among normal weight and over weight children (df 3, CV 20.372, TV 7.82).

Fig - 8a shows percentage of normal and overweight children according to mode of travel to school.

Fig - 8b shows percentage of normal and overweight children according to mode of travel for other purposes.

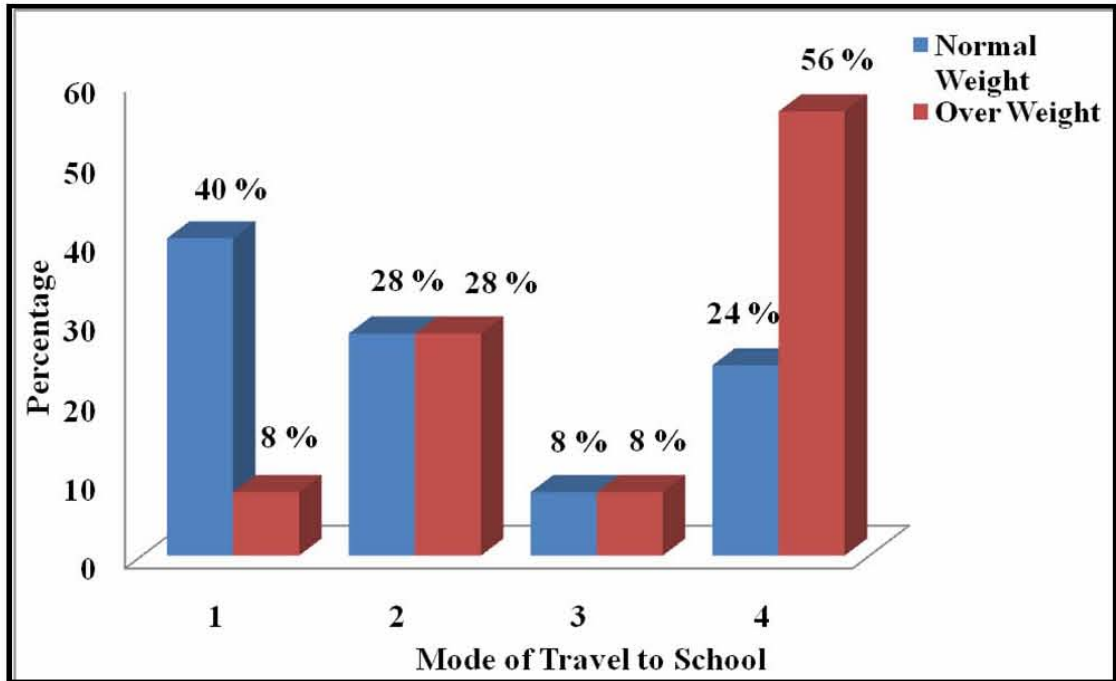


Fig-8a Percentage of normal and overweight children according to mode of travel to school

S. No	Mode of Travel to School
1	Walk
2	Auto/ Car/ School bus/ Bike
3	Private Bus
4	Bicycle

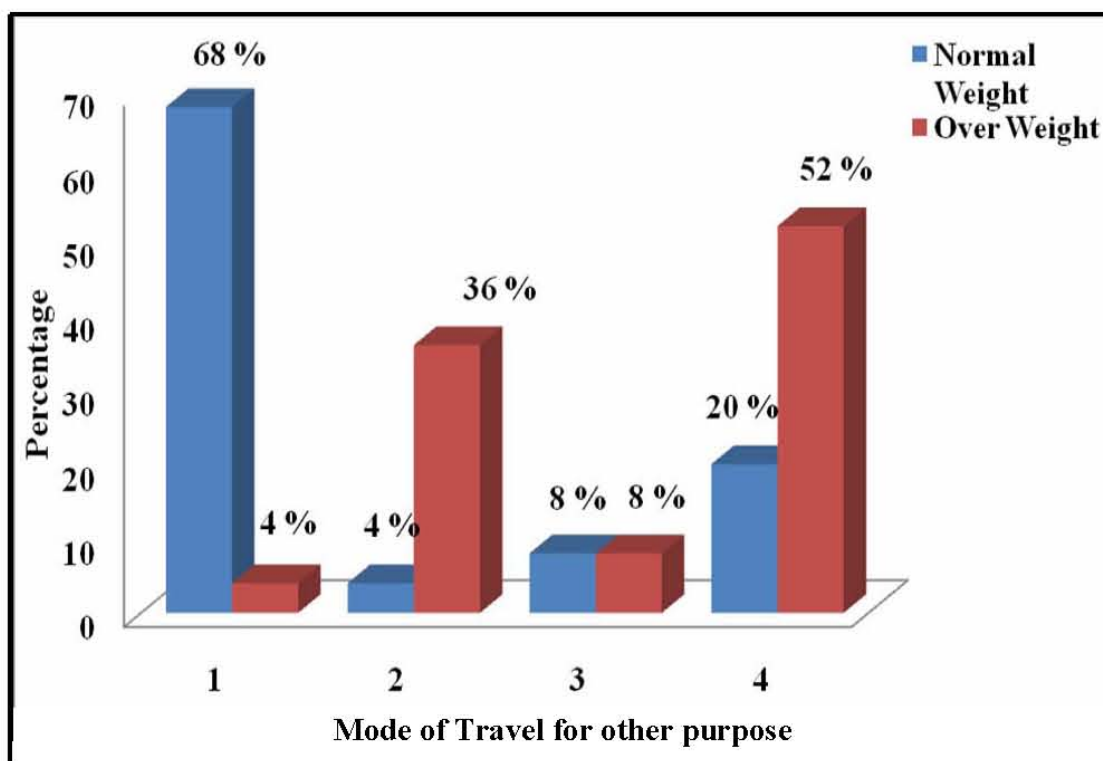


Fig-8b Percentage of normal and overweight children according to mode of travel for other purposes

S. No	Mode of Travel to Others
1	Walk
2	Auto/ Car/ School bus/ Bike
3	Private Bus
4	Bicycle

TABLE – X

**AVERAGE DURATION OF MODERATE AND VIGOROUS ACTIVITY OF
NORMAL WEIGHT AND OVERWEIGHT CHILDREN IN AND OUT OF
SCHOOL AND DURING WEEKEND AND HOLIDAYS IN HOUR PER DAY**

N=50

S. No	Activity	Duration	
		Normal Weight N = 25	Over Weight N= 25
1	At School	74.4 Minutes	42.4 Minutes
2	Out of School	42.13 Minutes	36.8 Minutes
3	During weekend and holidays	90 Minutes	48.4 Minutes

Table X presents average duration of moderate and vigorous activity in and out of school and during weekend and holidays.

At school normal weight children engaged in moderate and vigorous activities 74.4 minutes, out of school only 42.4 minutes and during weekend and holidays 90 minutes. Where as overweight children engaged in moderate and vigorous activities 42.13 minutes at school, 36.8 minutes out of school and during weekend and holidays 48.4 minutes.

This table concludes that normal weight children engaged more in moderate and vigorous activities more in and out of school and during weekend and holidays compared to overweight children.

Fig - 9 shows average duration of moderate and vigorous activity of normal weight and overweight children in and out of school and during weekend and holidays in hour per day

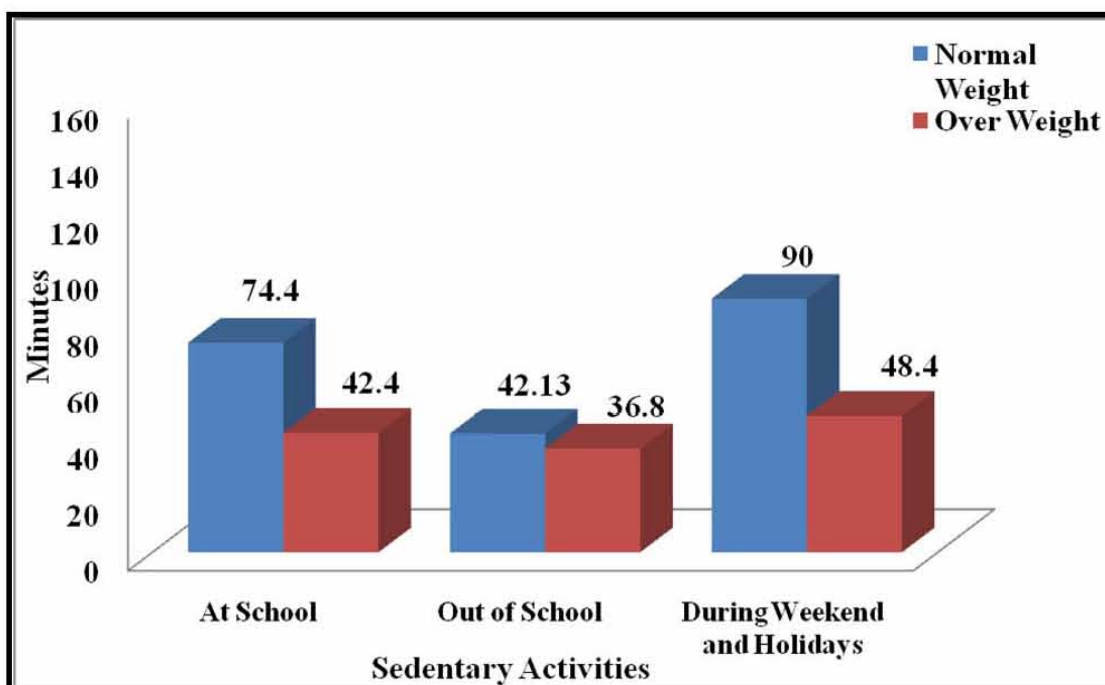


Fig-9 Average duration of moderate and vigorous activity of normal weight and overweight children in and out of school and during weekend and holidays in hour per day

TABLE XI

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN BASED ON EATING PATTERN AT HOME

N=50

S. No	Eating pattern	Normal Weight N = 25		Over Weight N= 25	
		F	%	F	%
1	Breakfast				
	Every day	25	100	21	84.0
	Not everyday	0		4	16.0
2	Evening Snacks				
	Every day	25	100	20	80.0
	Not everyday	0		5	20.0
3	Dinner				
	Every day	25	100	50	80.0
	Not everyday	0		5	20.0

Table XI presents the pattern of normal weight and overweight weigh children in three categories.

Among normal weight children, all (100 %) were taking breakfast, evening snacks and dinner everyday. Where as in the overweight children only 84 % took breakfast, 80% took snacks and dinner every day. The eating pattern of 16-25 % of overweight children was irregular.

This table concludes that the normal weight children had regular eating pattern (taking breakfast, evening snacks and dinner) compared to overweight children.

Fig - 10 shows percentage of normal weight and overweight children based on their eating pattern at home.

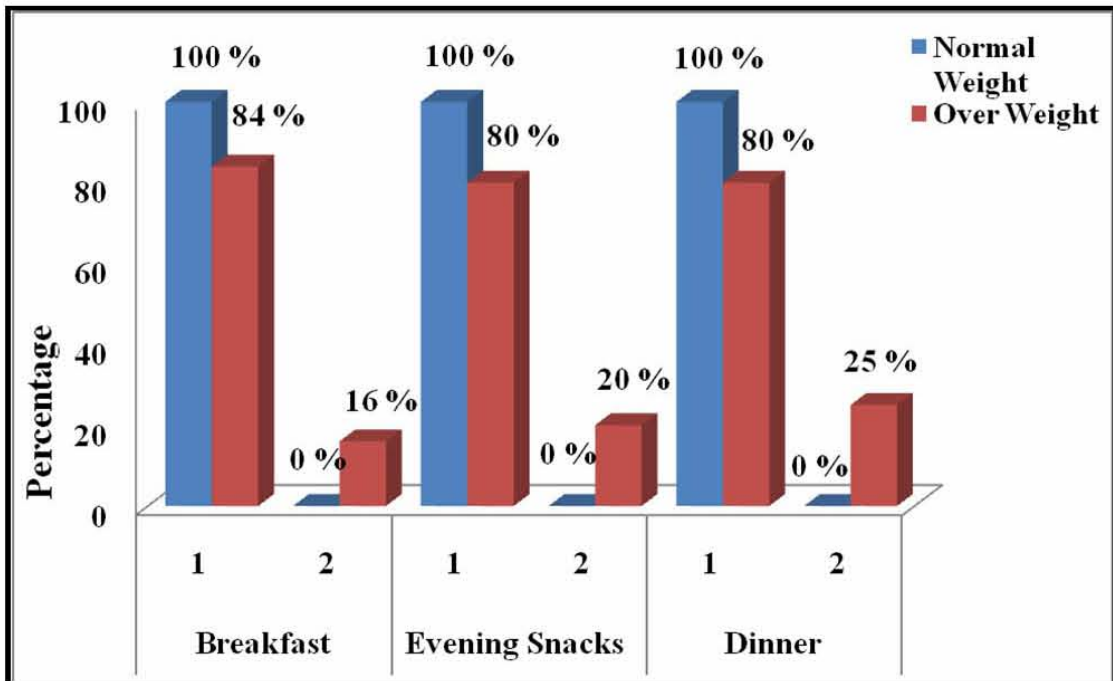


Fig-10 Percentage of normal weight and overweight children based on their eating pattern at home

S. No	Eating Pattern
1	Every Day
2	Not Every Day

TABLE XII

**FREQUENCY AND PERCENTAGE DISTRIBUTION OF OVERWEIGHT
AND NORMAL WEIGHT CHILDREN BASED ON
NUMBER OF MEALS PER DAY**

N=50

S. No	Number of meals	Normal Weight (N=25)		Over Weight (N=25)	
		F	%	F	%
1	2 Meals	19	76.0	1	4.0
2	3 Meals	6	24.0	15	60.0
3	4 Meals	0	0	8	32.0
4	Above 4 Meals	0	0	1	4.0

Table XII presents the number of meal pattern of normal weight and overweight children in four categories.

Among normal weight children majority (76%) had two meals pattern and 24% had three meal pattern per day. Majority (60%) of overweight children had three meals, more than three meals (4-32 %) per day.

From the table was noted that the number of meals per day may have some connection with the body weight of the sample.

TABLE XIII

**FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT
AND OVERWEIGHT CHILDREN BASED ON PACKED LUNCH**

N=50

S. No	Pattern	Normal Weight (N=25)		Over Weight (N=25)	
		F	%	F	%
1	Taking packed lunch to school				
	Everyday	21	84.0	22	88.0
	Not everyday	4	16.0	3	12.0
2	Eating packed lunch				
	Everyday	20	80.0	21	84.0
	Not everyday	5	20.0	4	16.0

Table XIII presents taking and eating packed lunch among normal weight and overweight children.

Majority of the normal weight children took packed lunch (84%) and ate those packed lunch (80%). Under overweight category also majority (88%) of the samples took packed lunch and ate the packed lunch (84%).

From the data it was noted that similarity exists between two groups based on packed lunch.

TABLE XIV

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN BASED ON TAKING SNACKS WHILE WATCHING TELEVISION

N=50

S. No	Taking Snacks	Normal Weight (N=25)		Over Weight (N=25)	
		F	%	F	%
1	Habits of taking Snacks				
	Yes	8	32.0	25	100.0
	No	17	68.0	-	-
2	Types of Snacks				
	Chips	5	20.0	21	84.0
	Sweets	1	4.0	24	96.0
	Fast food	2	8.0	18	72

Table XIV - presents normal weight and over weight children based on taking snacks while watching television.

Among normal weight children majority (68%) did not have the habit of taking snacks while watching television. Among those who took snacks, majority (20%) preferred chips than other varieties.

Where as in overweight group all the samples had the habit of taking snacks while watching television. The preference of taking chips varieties was 84%, sweet varieties 96% and that of fast food was 72%.

This table concludes that the habit of taking snacks while watching television was high among the overweight category with preference for the sweets and fried items compared to normal weight children.

TABLE XV**FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN BASED ON ITEMS PREFERRED TO BUY****N=50**

S. No	Items	Normal Weight (N=25)		Over Weight (N=25)	
		F	%	F	%
1	Berger	-	-	8	32.0
2	Noodles	3	12.0	15	60.0
3	Chips	20	80.0	16	64.0
4	Balepoori	5	20.0	6	24.0
5	Ice Creams	3	12.0	24	96.0
6	Chocolates	4	16.0	24	96.0
7	Halva	0	-	2	8.0
8	Cakes	0	-	17	68.0
9	Pizza	0	-	10	40.0
	Others				
10	Biscuits	1	4	-	-

Table XV Presents normal weight and over weight children based on items preferred to buy

Among the normal weight samples 80% preferred chips, 20% balepoori, 16% chocolates, 12% Ice creams or Noodles and 1% biscuits.

Among overweight samples majority (96%) preferred Ice Creams and chocolates, 68% preferred cakes, 64% chips, 60% noodles, 40% Pizza, 32% burger, 24% balepoori and 8% Halva.

From this table it was noted that the preference shown by the overweight children for the fried items, fast food items and sweets were very high compared to normal weight children.

Fig - 11 shows percentage of normal weight and overweight children based on items preferred to buy

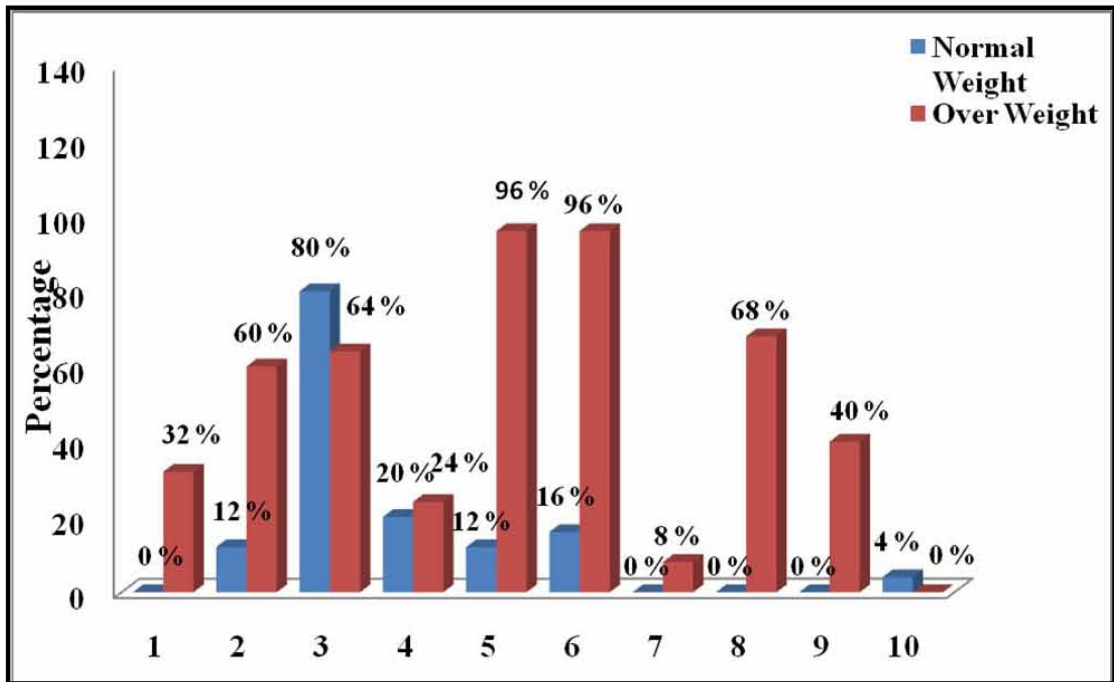


Fig-11 Percentage of normal weight and overweight children based on items preferred to buy

S. No	Items
1	Berger
2	Noodles
3	Chips
4	Balepoori
5	Ice Creams
6	Chocolates
7	Halva
8	Cakes
9	Pizza
10	Biscuits

TABLE XVI

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN BASED ON PURCHASE OF SOFT DRINKS BEVERAGES FROM OUTSIDE

N=50

S. No	Items	Normal Weight (N=25)		Over Weight (N=25)	
		F	%	F	%
	Food Items Purchased				
1	Milkshakes	4	16.0	19	76.0
2	Soft drinks	6	24.0	13	52.0
3	Fresh juice	6	24.0	21	84.0
4	Buttermilk	0	0.0	15	60.0
5	Sugar cane juice	3	12.0	14	56.0
6	Tender coconut	11	44.0	10	40.0

Table XVI presents normal weight and overweight children based on item preferred to buy

Overall purchase of soft drinks among normal weight children ranged between 12% to 44%

Among over weight children majority (44%) preferred tender coconut water, intake of soft drinks range from 40% to 84%. Majority (94%) preferred to have fresh fruit juice followed by milk shake (76%).

This table concludes that the habit of taking beverages from outside was higher among the overweight category compared to normal weight children.

Fig - 12 shows percentage of normal weight and overweight children based on purchase of soft drinks and beverages from outside.

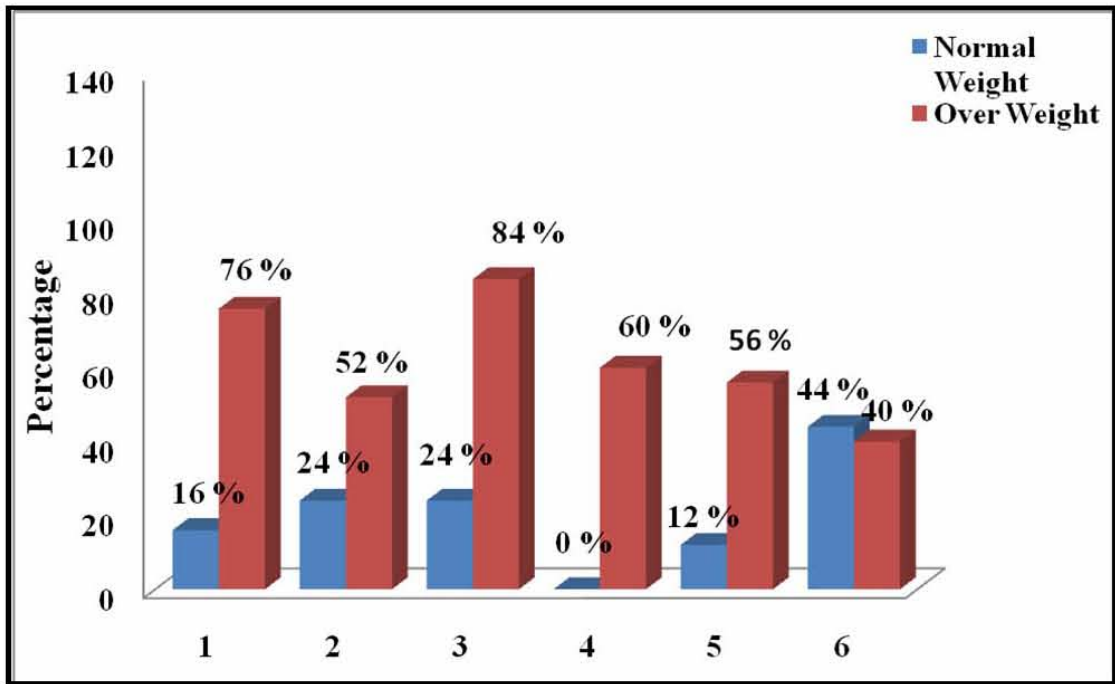


Fig-12 Percentage of normal weight and overweight children based on purchase of soft drinks and beverages from outside.

S. No	Items
1	Milkshakes
2	Soft drinks
3	Fresh juice
4	Buttermilk
5	Sugar cane juice
6	Tender coconut

TABLE XVII

FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT AND OVERWEIGHT CHILDREN BASED ON FREQUENCY OF FOOD ITEM PURCHASED AND IN TAKE OF BEVERAGES

N=50

S. No	Items	Normal Weight (N=25)		Over Weight (N=25)	
		F	%	F	%
1	Frequency :				
	Daily	0	0	2	8.0
	> 3 Times a week	0	0	20	80.0
	< 3 Times a week	25	100.0	3	12.0
2	Frequency of intake of beverages :				
	Daily	0	0	3	12.0
	> 3 Times a week	2	8.0	22	88.0
	< 3 Times a week	23	92.0	0	0

Table XVII presents normal weight and over weight children based on frequency of food item purchased and in take of beverages

All (100%) the normal weight children preferred to buy noodles, chips, balepoori, ice creams, chocolates, halva, cakes, pizza and biscuits in the frequency of less than 3 times a week. Frequency of taking beverages like milkshake, soft drinks, fresh juice, buttermilk, sugarcane juice and tender coconut by majority (92%) of the samples was less than 3 times in a week and only for 8% of the children it was more than 3 times a week.

Among Overweight children majority (80%)of them bought food items like noodles, chips, balepoori, ice creams, chocolates, halva, cakes, pizza more than 3 times a week, 8 - 12% purchased those foods daily. Frequency of taking beverages like milkshake, soft drinks, fresh juice, buttermilk, sugarcane juice and tender coconut in

more than 3 times a week was 88% and 12% of over weight children bought the soft drink beverages more than three times a day.

This table concludes that the frequency of intake of fried food/ soft drinks was more among overweight children compared to normal weight children.

TABLE XVIII**MEAN SCORE OF EATING HABITS AND LEVEL OF SIGNIFICANT OF
NORMAL WEIGHT AND OVER WEIGHT CHILDREN**

N= 50

S. No	Dietary Pattern	Max Score	Normal Weight (N=25)		Over Weight (N=25)		t P 0.05 df 48
			Mean Score	Mean Score %	Mean Score	Mean Score %	
1	Eating pattern	6	6	100.0	5.44	90.66	4.78*
2	Packed lunch	2	1.84	92.0	1.88	94.0	0.398 ^{ns}
3	Meal pattern	2	2	100.0	1.64	82.0	3.71*
4	Eating snacks while watching TV	2	1.68	84.0	1	50.0	7.12*
5	Pocket Money and Frequency of Taking Snacks and Beverages	8	6.92	86.5	4.92	61.5	1.47 ^{ns}
	Overall	20	18.44	92.5	14.88	75.63	

Table Value 2.01

* significant

df- degree of freedom

ns - not significant

Table XVIII Presents eating habits of normal weight and over weight children

The mean score percentage of normal weight children was 6 (100%) for eating pattern, 1.84 (92 %) for packed lunch, 2 (100 %) for meal pattern, 1.68 (84 %) for eating snacks while watching TV and 6.92 (86.5 %) for Pocket Money and Frequency of Taking Snacks and Beverages.

Among overweight children mean score for packed lunch was 1.88 (94 %), for eating pattern was 5.44 (90.66 %) and for eating meal pattern 1.64 (82 %). The mean score for pocket money and frequency of taking snacks and beverages was 4.92 (61.5%). The mean score for eating snacks while watching TV was 50%.

From the table it was noted that the normal weight children scored well for the eating habits compared to overweight.

The 't' value showed statistical difference, indicating that there was a significant difference between eating pattern (df 48, CV 4.78, TV 2.01), meal pattern(df 4, CV 3.71, TV 2.01), eating snacks while watching television (df 48, CV 7.12, TV 2.01) among normal weight and overweight children.

Fig - 13 shows percentage mean score of eating habits of normal weight and overweight children.

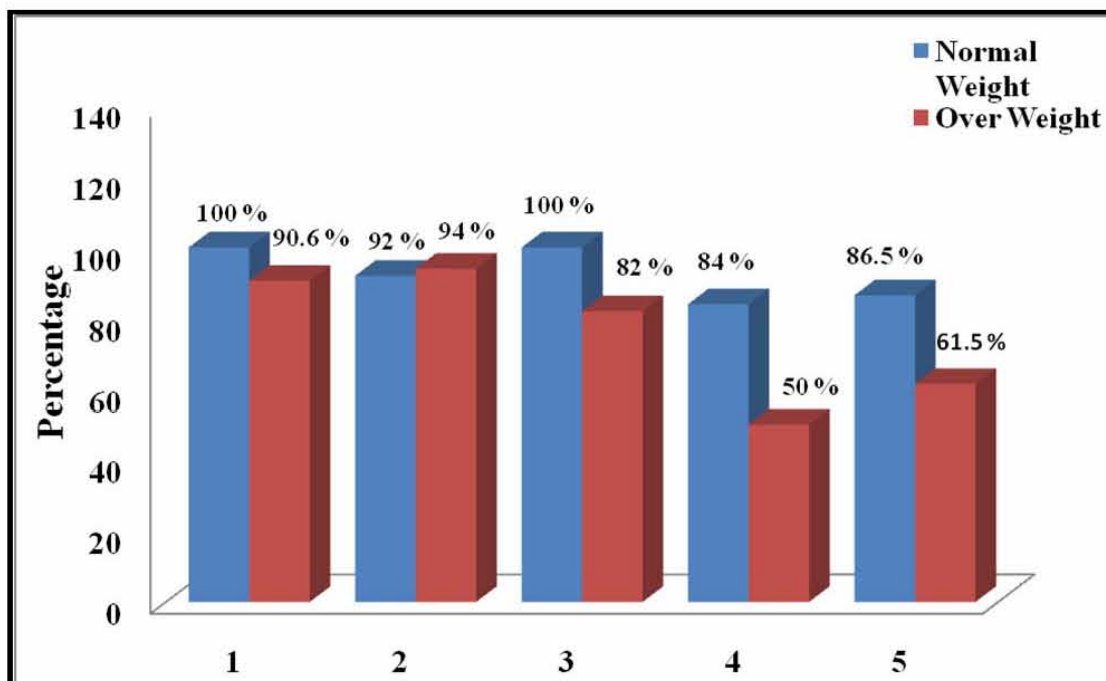


Fig-13 Percentage mean score of eating habits of normal weight and over weight children

S. No	Dietary Pattern
1	Eating pattern
2	Packed lunch
3	Meal pattern
4	Eating snacks while watching TV
5	Pocket Money and Frequency of Taking Snacks and Beverages

TABLE XIX

**FREQUENCY AND PERCENTAGE DISTRIBUTION OF NORMAL WEIGHT
AND OVERWEIGHT CHILDREN BASED ON
LEVEL OF EATING HABITS**

N=50

S. No	Level of Habits	Normal Weight N = 25		Over Weight N= 25	
		F	%	F	%
1	Good	22	100.0	10	40.0
3	Poor	-	-	15	60.0

Table XIX presents the normal weight and overweight children based on level of eating habits

All (100 %) of the normal weight children were having good eating habits. Where as the majority (60 %) of overweight children had poor score and only 40 % were had good score for eating habits.

This table concludes that majority of normal weight children had good eating pattern compared to over weight children.

Fig - 14 shows percentage of normal weight and overweight children based on Level of eating habits.

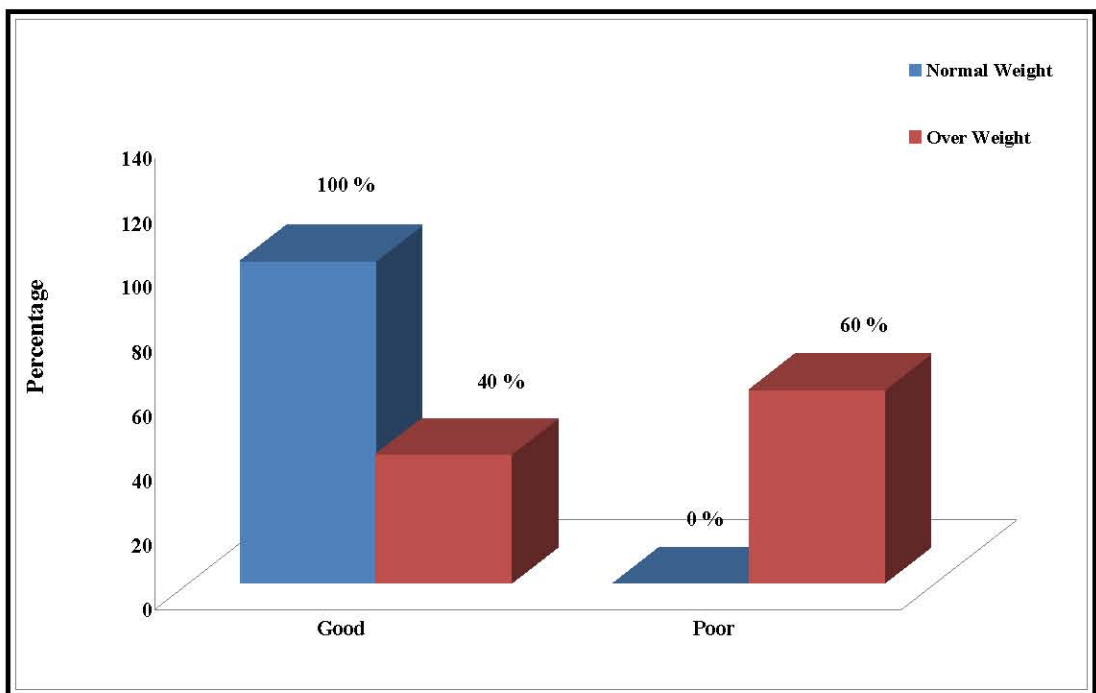


Fig- 14 Percentage of normal weight and overweight children based on Level of eating habits

DISCUSSION

CHAPTER V

DISCUSSION

This study focused on assessing the life style of normal weight and overweight children in terms of physical activity and dietary pattern. This chapter presents discussion of the main findings.

Distribution of samples based on Body Mass Index

Table I presents frequency and percentage distribution of samples based on Body Mass Index. Majority 20 % of normal weight children lies between the Body Mass Index of 17.5 – 20, where as 32 % of overweight children lies between the body mass index of 25 – 27.5. Average Body Mass Index of normal weight children was 20.64 whereas overweight children 26.80.

Demographic characteristics of the normal weight and overweight children

Table II(a)and(b) present the frequency and percentage distribution of demographic variables among normal weight and overweight children. Majority (40 and 48 %) of both normal weight and overweight children were under the age group of 13-14 years. Most of the families of overweight children monthly income was above 10,000 and most of them had comfort items like computers, television, car, bike, cycle and exercising equipments in their home compared to normal weight children. The table also reveals that most of the overweight children's parents were graduate and majority (44 %) of fathers were professionals compared to normal weight children. Majority of overweight children mothers (64%) were working women compared to only (12 %) of normal weight children.

Categories of physical activity during games period and while at school

Table III and **IV** presents frequency and percentage categories of physical activities among normal weight and overweight children during games period and while at school. In the present study majority of normal weight children (64 %) engaged in vigorous activities during games period and 36-72% were engaged in vigorous activities

before school begins, during lunch and after school is over. Whereas among overweight children (64 %) were engaged in both moderate and vigorous activity during games period at school, and 16-24% were engaged in vigorous activities before school begins, during lunch and after school is over.

This table reveals that more or less both normal weight and overweight children engaged in similar manner in physical activities during games period and normal weight children engaged more in vigorous activities compared to overweight children during school begins, lunch time and after school is over.

Based on the study done by **Stratton G, Ridgers N D(2007)** on physical activity among normal weight and overweight children, it was noted that moderate to vigorous physical activity was double among normal weight children compared to overweight children during break time at school.

Categories of physical activities after returning from school and during weekend and holidays

Tables V and **VI** show frequency and percentage distribution of physical activities after returning from school and during weekend and holidays. It was noted that 44% of normal weight children engaged in indoor and outdoor games after returning from school, 32% were engaged in vigorous activities and other 32% engaged in moderate and vigorous activity after returning from school and during weekend and holidays.

Among overweight children only 20% were engaged in indoor and outdoor games after returning from school and 64% were engaged in light activities during weekend and holidays.

This table reveals that normal weight children were engaged more in moderate to vigorous activities compared to overweight children. And during weekend and holidays most of the overweight children were engaged in light activities compared to normal weight children.

The present study findings was supported by a study done by **S.A Tebb and Moore M.S (1997)** ,there is some evidence that both a high proportion of dietary fat and low level of physical activity may increase the likelihood of weight gain.

Types of physical exercises among normal weight and overweight children

Table VII shows frequency and percentage distribution according to type of physical exercise carried out among normal weight and overweight children. Around 84-96 % of normal weight children were doing physical exercise such as walking and bicycling whereas physical exercises among overweight children was between 36-68 % only.

This table clearly reveals that normal weight children engaged in all forms of physical exercises compared to overweight children.

The χ^2 value did not show any statistical significance, indicating that there was no significant association between the two categories of physical exercise among normal weight and overweight children.

The present study findings was supported by a study done by **Laxmaiah Avula et.al (2007)** study emphasizes that regular physical exercise, doing household activities, regular television viewing, and healthy eating behaviors could contribute to controlling overweight and obesity.

Types of sedentary activity among normal weight and overweight children

Table VIII presents frequency and percentage distribution of sedentary activities after returning from school. This table reveals that majority of overweight children (32-64 %) were engaged in sedentary activities compared to (4-20 %) of normal weight children

The χ^2 value did not show any statistical significance it indicate that there was no significant association between sedentary activities among normal weight and overweight children.

Mode of travel among normal weight and overweight children

Table IX presents frequency and percentage distribution according to overall response of mode of travel to school and for other purpose such as visiting friends and shopping. Among normal weight 10-17 children (40-68 %) were going to school and for other purposes by walking. Where as in overweight children most of them 52 % travelled by bicycling.

This table reveals that in majority of normal weight children the mode of travel was by walking when compared to overweight children who travelled through bicycle and bike.

The χ^2 value did not show any statistical significance, indicating that there was no significant association between the mode of travel to school among normal weight and overweight children. And there was a significant association noted between the mode of travel for other purposes among normal weight and overweight children.

From the **Table X** it was noted that average duration of physical activity per day at school was 74.4 minutes for normal weight children and only 42.4 minutes for overweight children, 42.13 minutes and 36.8 minutes at home for normal weight and overweight children. Average duration of physical exercise during weekend and holidays for normal weight children 90 minutes and for overweight children 48.4 minutes per day.

From the table it was noted that normal weight children engaged more duration in physical activities and exercises compared to overweight children.

The present study findings was supported by a study done by **Strong W et.al (2009)** it reveals that school age children should participate daily in 60 minutes or more of moderate to vigorous physical activity.

Eating pattern, meal pattern and packed lunch among normal weight and overweight children

Table XI, XII and XIII shows frequency and percentage distribution of eating pattern, meal pattern and packed lunch among normal weight and overweight children. This table reveals that 76-100% normal weight children had good eating pattern, meal pattern, took packed lunch and ate those packed lunch compared to 60-88% of overweight children.

Distribution of samples based on taking snacks while watching television

Table XIV shows frequency and percentage distribution of taking snacks while watching television. This table shows that majority (68%) of normal weight children did not have the habit of taking snacks while watching television and 20% took chips than other varieties. Whereas 100% of overweight children had the habit of taking snacks while watching television and 96% preferred sweet varieties.

This table reveals that the habit of taking snacks while watching television was high among overweight children compared to normal weight children.

The present study findings was supported by a study done by **M. Deanna et al. (2009)**, the findings of the study shows that both snacking and television watching have been associated with childhood overweight.

Distribution of samples based on the items preferred to buy, purchase of soft drinks beverages and its frequency

Table XV, XVI and XVII reveals frequency and percentage distribution of normal weight and overweight children. It shows that majority (80%) of normal weight children preferred to buy chips, 12-44% preferred soft drinks beverages and frequency of taking these items was less than three times a week. Where as 60-90% of overweight children were preferred noodles, chips, ice creams and chocolates, 40-84% were preferred soft drinks beverages and frequency of intake was more than three times a week.

From this table it was noted that preference shown by the overweight children for fried items, fast foods, sweet varieties and soft drinks beverages from outside was very high compared to normal weight children.

Similar result was obtained in the study done by **Kuriyan Rebecca et.al (2007)**, among overweight children. The result showed that eating behavior and increased consumption of fried foods was significantly associated with overweight children.

Mean score and level of eating habits among normal weight and overweight children

Table **XVIII and XIX** reveals that the mean score percentage for various activities (eating pattern, packed lunch, meal pattern, eating snacks while watching television and pocket money and frequency of taking snacks and beverages) was higher for normal weight children compared to overweight children. The table also reveals that majority (88%) of normal weight children had good eating habits compared to overweight children.

SUMMARY

CHAPTER VI

SUMMARY, FINDINGS, CONCLUSION, IMPLICATIONS AND RECOMMENDATION

INTRODUCTION

This chapter presents the Summary, Findings, Conclusion, Implications and Recommendation.

SUMMARY OF THE STUDY

Life style is considered to be an important determinant of health and sickness. Historically, a fat child means a healthy child, one who is free from infection. Today obesity or overweight in children, very often related to degenerative diseases is mainly due to improper lifestyle and dietary pattern. According to World Health Organization (2004), Body Mass Index between 18.5 to 24.99 is considered as normal weight and between 25 to 29.99 is considered as overweight.

Overweight is associated with the onset of major chronic diseases leading to complications and problems in children and adult. Childhood obesity/overweight is very often a risk factor for obesity in adulthood, compared to adult onset obesity. Hence close monitoring of overweight and taking timely preventive measures will be an effective approach in dealing with the problems. Incidence of childhood overweight is on the rise since last few decades and is still continuing to rise. Since the 1970s, the prevalence of overweight children has more than doubled for preschoolers ages 2-5 and adolescents ages 12-19 and it has more than tripled for children 6-11 years. Nearly one third of children and adolescents of both sexes, aged 6-19 years (30%) are considered to be either at risk for overweight (The Center for Health and Healthcare in Schools 2005). The transition in nutrition, sedentary life style, lack of exercise, increased television watching, computer addiction, improper dietary pattern adopted by children today are the major causes of overweight seen in children. The World Health Organization has

identified school as important settings for promotion of physical activity among children. Physical education, provided at school, is an ideal way to encourage activity and develop fitness among children. For this reason, the Centers for Disease Control and Prevention (CDC), the National Association for Sports and Physical Education (NASPE), and the American Heart Association all recommended comprehensive daily physical education for children Kindergarten to 12th standard.

The aim of the study was to assess the physical activity / exercise of normal weight and overweight children in and outside of school, their eating pattern and to see whether there is any difference.

The conceptual frame work used for this study was based on Rosenstoch's and Becker and Maiman's 'Health Belief Model'.

A descriptive and comparative survey approach was used. The study was conducted in a selected school with a sample of 25 normal weight and 25 overweight children studying in 7th to 11th standard, samples were selected by convenience sampling method.

The tool consisted of a self administered structured questionnaire with 26 items with two groups to assess the life pattern of school children.

FINDINGS OF THE STUDY

Demographic characteristics

In demographic characteristics presents that most of the overweight children are male, under the age group of 13-14 years, who has family income above 10,000 and facilities like computer, car, television, bike, cycle, exercise equipments. And most of the parents of overweight children are professionals and mothers are working compared to normal weight children.

Life Style

Life style of both normal weight and overweight children were grouped in to two headings, Physical activity/exercise and eating pattern. It was noted that normal weight children were engaged more in physical activity/exercise at school, home, and during weekend and holidays and had good eating pattern compared to overweight children. Majority of overweight children like to engaged in sedentary activities compared to normal weight children.

Significant Finding

There was a significant association found in between mode of travel for other purposes other than going to school among normal weight and overweight children (df-3, TV-7.82, CV-20.87).

There was a significant association noted between eating pattern (df 48, TV-2.01, CV-4.78), meal pattern (df-48, TV-2.01, CV-3.71), and eating snacks while watching television (df-48, TV-2.01, CV-7.12) among normal weight and overweight children.

CONCLUSION

Physical activity of each individual and eating pattern are inter linked. This study results shows that majority of normal weight children were engaged in physical activity at school and during weekend and holidays and followed a good eating pattern compared to overweight children. And most of the overweight children were engaged in sedentary activities at home.

LIMITATIONS

Exact response cannot be expected from the children.

IMPLICATIONS

The study has its implication in nursing practice, nursing education, nursing administration, nursing research, social pediatrics and community.

Nursing Practice

Nursing professionals can provide a better frame work for healthy life style and school based programs. Nurses understand the biologic, psychological, causative and social aspects of being an overweight and their impact on health. The nurse can render awareness through education of the parents and children at the school, hospital and community level.

The nurse can also improve the knowledge of parents, children and school teachers by conducting education program and by counseling. A healthy life style is important for the proper growth and development. Guidance and Counseling services should be arranged timely and provided with adequate knowledge, positive support and make the child as a healthy member of society in future.

Nursing Education

Findings of the study have some implication for nursing education. The health care system pay more attention on the training of nursing students and school teachers. So that, they will acquire more knowledge and will be able to help oneself in knowing the importance of healthy lifestyle. Motivation to change and psychological counseling technique is key to any lifestyle intervention. Teaching about healthy diet and the importance of maintaining moderate physical activity in young children is important as obesity is more easily prevented than treated. It is important to begin preventive efforts early in childhood.

Nursing Administration

Nursing administrators should be necessarily involved in formulating policies for health education program in the school, hospital as well as community settings. All the

health education and school based program should integrate education on healthy lifestyle changes in children.

Nursing Research

There is a need for extensive research in this area. The findings of the study help to expand the scientific body of knowledge upon which further research can be conducted.

In the Community

The community health nurse has an important role as health educator, health promoter and health protector in the community. During home visits the nurse can identify the vulnerable overweight children and observe different lifestyle adopted by the family and children. Nursing personal working in the community health department should be given in service education to update and improve their knowledge regarding overweight and life style practices. Within the healthcare community, the multidisciplinary team might include a primary physician, an obesity specialist, a diabetic educator, a nurse, a dietitian, a fitness counselor and a social worker as well as the patient and family. Education and counseling families of obese children through media use is vital. Healthcare professionals should also become involved in setting up new community programs to promote healthy lifestyle.

RECOMMENDATIONS

Based on the findings of the study, the investigator proposed the following recommendations.

- A replication of present study can be done with large sample.
- A comparative study can be conducted between the rural and urban areas.

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APPENDICES

APPENDIX - I

LETTER REQUESTING PERMISSION TO CONDUCT THE STUDY

To,

The Principal
R.V.S Matriculation Higher Secondary School,
Sulur, Coimbatore.

Respected Sir/ Madam,

Sub: - Letter requesting permission for conducting the study

Miss. Sreeja Mohan is a Post Graduate Nursing student of our institution. She has selected below mentioned topic for her Research Project to be submitted to The TamilNadu Dr. MGR Medical University of Health Sciences as a partial fulfillment of this Master of Nursing Degree.

“A comparative study to assess the life style of school children with normal weight and overweight in a selected school, at Coimbatore.”

Regarding this project, she in need of your esteemed help and co-operation as she is interested in conducting a study of her project in your institution. I request you to kindly permit her to conduct the proposed study and provide her the necessary facilities.

The student will furnish further details of the study if required personally. Please do the needful and oblige.

Thanking you,

Place : Coimbatore

Yours faithfully,

PRINCIPAL

APPENDIX - II

PERMISSION LETTER FOR CONTENT VALIDITY

From,

Miss. Sreeja Mohan
M.Sc. (N) Student,
R.V.S College of Nursing,
Sulur, Coimbatore.

To,

Through the Principal,

Respected Sir/ Madam,

Sub: - Letter requesting opinion and suggestion of experts for establishing content validity of the tool.

I am a M.Sc (N) student in RVS College of Nursing, Sulur, Coimbatore in the speciality of Child Health Nursing. As per requirement for the partial fulfillment of this nursing degree under The TamilNadu Dr. MGR Medical University. I have selected the following topic for dissertation.

“A comparative study to assess the life style of school children with normal weight and overweight in a selected school, at Coimbatore.”

I kindly request you to go through the research tool and validate against criteria given in the sheet.

Thanking you,

Yours faithfully,

(Sreeja Mohan)

Enclosure:-

1. Objectives of the study
2. Description of the tool
3. Research Tool
4. Criteria rating for validation
5. Content validation certificate.

APPENDIX - III

CERTIFICATE OF CONTENT VALIDITY

This is to certify that the tool developed by Miss. Sreeja Mohan, M.Sc.
(N)

Student, R.V.S College of Nursing , Sullur, Coimbatore to collect data on
the problem.

**“A comparative study to assess the life style of school children with
normal weight and overweight in a selected school, at Coimbatore.”**

Is validated by the undersigned and she can proceed with this tool to
conduct the main study.

Name :

Address :

Signature :

Seal :

Date :

APPENDIX - V

REQUISITION LETTER FOR CO-GUIDE

From

Miss. Sreeja Mohan
M.Sc, (N) Student,
R.V.S College of Nursing,
Sulur, Coimbatore.

To

Dr. D. Ramamoorthy, M.B.B.S, DCH
Medical Officer, Pediatrician,
R.V.S Multi Specialty Hospital ,
Coimbatore.

Through the Principal

Sub: - Request for Co-Guide

I wish to state that I am Miss. Sreeja Mohan II Year M.Sc Nursing Student, R.V.S College of Nursing have selected the below mentioned topic for dissertation as a As per requirement for the partial fulfillment for the Master of nursing degree to The TamilNadu Dr. MGR Medical University.

“A comparative study to assess the life style of school children with normal weight and overweight in a selected school at Coimbatore.”

Regarding this I am in need of your valuable help and co-operation by providing services to be a co-guide for my study.

I humbly request your highness to consider the same and do the needful.

Thanking you,

Yours Sincerely,

(Sreeja Mohan)

APPENDIX - VI

QUESTIONNAIRE

INTRODUCTION:

Overweight in children is a common issue that causes great health concern. The socio cultural changes has resulted a change in the lifestyle of children & adults all over the world. Today everybody is concerned about the bodyweight & tryout various measures to keep the body weight under control.

PURPOSE:

The purpose of this questionnaire is to find out your lifestyle particularly with regard to eating, physical activities and exercises.

INSTRUCTIONS:

Kindly go through each question and mark your answers in appropriate boxes. There is no right and wrong answers. Tick all that is applicable to you in the boxes given. Your answers will be kept confidential.

PART – 1 DEMOGRAPHIC DATA

Kindly give the following personal information by marking in the appropriate boxes.

1. Personal Information:

a) Your Age : 12-13 13-14 14-15 15-16

b) Your Sex : Male Female

2. Educational Qualification:

a) Father : illiterate Primary Middle Secondary Graduate

b) Mother : illiterate Primary Middle Secondary Graduate

3. Occupation of :

a) Father : _____

b) Mother : _____

4. Family Income :

- a) Below 5000 b) 5001 - 10000
c) Above 10000

5. If you have the following at home, kindly tick (✓) in the box?

- a) Computer b) Television
c) Car d) Bike
e) Cycle f) exercising equipments

6. What type of food do you take at home?

- a) Pure vegetarian b) Occasionally Non Vegetarian
c) Mostly non Vegetarian d) Vegetarian who takes eggs

7. Your family diet contains the following:

Sl. No	Items	Daily	Once a week	Twice a week	Trice a week
a.	Cereals : (Eg. wheat, rice etc)				
b.	Pulses : (Eg. Dhal varieties)				
c.	Vegetables : (Eg. Green leafy vegetables, Non leafy vegetables)				
d.	Milk and Milk products : (Eg. Ghee, butter, cheese, creams, curds etc.)				
e.	Sweets : (Eg. Pastries, icecreams, chocolates, etc)				
f.	Non Veg. foods : (Eg. Meat, Fish, Chicken, Mutton, Egg etc)				

PART II : ASSESSMENT OF LIFE STYLE

Below given are questions on physical activities/exercises and diet. Do not leave out any questions. Kindly mark your answers in the appropriate boxes.

A) Physical activities/ Exercises.

1) What games do you play in school during the game period?

- | | | | |
|----------------|--------------------------|----------------|--------------------------|
| a) Basket Ball | <input type="checkbox"/> | b) Foot ball | <input type="checkbox"/> |
| c) Tennis | <input type="checkbox"/> | d) Cricket | <input type="checkbox"/> |
| d) Badminton | <input type="checkbox"/> | e) Volley boll | <input type="checkbox"/> |
| f) kho – kho | <input type="checkbox"/> | g) Ring ball | <input type="checkbox"/> |
| h) Throw ball | <input type="checkbox"/> | i) Any others | <input type="checkbox"/> |
-

2) How long do you play games?

- | | | | |
|--------------|--------------------------|------------|--------------------------|
| a) ½ an hour | <input type="checkbox"/> | b) 1 hour | <input type="checkbox"/> |
| c) 1 ½ hour | <input type="checkbox"/> | d) 2 hours | <input type="checkbox"/> |

3) How many times do you have game period in a week?

- | | | | |
|------------|--------------------------|------------|--------------------------|
| a) 1 time | <input type="checkbox"/> | b) 2 times | <input type="checkbox"/> |
| c) 3 times | <input type="checkbox"/> | d) 4 times | <input type="checkbox"/> |

4) Do you play games in the school other than during games period?

- | | | | |
|--------|--------------------------|-------|--------------------------|
| a) Yes | <input type="checkbox"/> | b) No | <input type="checkbox"/> |
|--------|--------------------------|-------|--------------------------|

5) If yes, answer the following

Play time	Games played	Frequency			Duration			
		Daily	Once a week	Twice a week	½ hour	1 hour	1 ½ hour	2 hours
Before school begins	a _____							
	b _____							
	c _____							
	d _____							
	e _____							
During lunch time	a _____							
	b _____							
	c _____							
	d _____							
	e _____							
After school is over	a _____							
	b _____							
	c _____							
	d _____							
	e _____							

6) After returning from school do you engage in playing games at home?

a) Yes

b) No

7) If yes, answer the following?

	Types of games played	Frequency			Duration			
		Daily	Once a week	Twice a week	½ hour	1 hour	1 ½ hour	2 hours
Playing indoor games	a _____							
	b _____							
	c _____							
	d _____							
	e _____							
Playing outdoor games	a _____							
	b _____							
	c _____							
	d _____							
	e _____							

8) If you do not play any games after coming from school in which of the following activities do you engage?

Activities	Frequency			
	Daily	Once a week	Twice a week	Trice a week
a) Watching TV				
b) Using computer				
c) Listening music				
d) Doing home work				
e) Reading books				
f) Going for tuition				
g) Chitchatting with family members				
h) Chitchatting with friends				
i) Any other _____				

13) What is your mode of travel to go to school?

- a) By walk b) By auto/Car/School bus/Bike
c) By Private bus d) By bicycle

14) What is the distance between your home & school?

- a) Less than 1 km. b) 1 km.
c) More than 1 km.

15) What is your usual mode of travel for other purpose (shopping, visiting friends etc.)

- a) By walk b) By auto/car/bike
c) By bus d) By bicycle

B) Eating Pattern :

16) Do you eat

- | | Yes | No | Everyday | Not everyday |
|-------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Break fast | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Evening snacks | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Dinner | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

17) Do you take packed lunch to school?

- a) Everyday b) Not every day

18) Do you eat the packed lunch taken from your home?

- a) Yes b) No

19) What is your usual meal pattern per day?

- a) 2 meals b) 3 meals
c) 4 meals d) above 4 meals

20) Do you take snacks when you watch television?

- a) Yes b) No

21) If yes, what type food you take?

- a) Chips b) Sweets

c) Fast foods d) Any other _____

22) Do you get pocket money to buy from outside?

a) Yes b) No

23) Which of the following you prefer to buy?

a) Burger b) Noodles

c) Chips d) Bale Poori

e) Ice creams f) Chocolates

g) Halva h) Cakes

i) Pizza j) others _____

24) How often do you buy?

a) Daily

b) less than 3 times a week

c) More than 3 times a week

d) Any other _____

25) What drinks you buy from outside?

a) Milkshakes b) Soft drinks

c) Fresh fruit juice d) Butter milk

e) Sugarcane juice f) Tender coconut

g) Any other _____

26) How often do you buy these items?

a) Daily b) less than 3 times a week

c) more than 3 times a week d) Any other _____

Édhj'f'

K-Diu :

m½fkhd vilís FHªijfĒñ cl± Mnuhij»a« g!za xU bghJthd fUªJifis¥ g!z Muh-nth«. ,aj cyf« KGt½Y« c's bgÇat@f' k!W« FHªijfĒñ fyhørhhu« k!W« ehfßfšfĒñ mo¥gilÆ± mt@fĒñ th³jif Kiw K!zYkhf khzísJ. jibghGJ x²bthUtÇñ cl± vil g!za Étu« g±ntW fhuÂfĒdh± m½ªJ mt@fĒñ cl± vil jšfĒñ f£L¥gh£oiF' itª½Uj»ñwd®.

bghU' :

Ñ³if©l Édhj'fĒñ ,ykhf jšfĒñ th³jif Kiw k!W« czî gHjftHj'fšfšf' / cligÆl'z'f' g!z xU M-î cl±g!za fUªJf' :

Ñ³if©l x²bthU Édhj'f' k!W« mjiFÇa g½±f' Ñ³ c's f£lª½± Fzif¥g£L'sJ. m½± rÇahdit k!W« jtwhd g½±f' bfhLj'f¥g£L'sd. Ñ³if©lt!z± c's f£lšfĒ± rÇahd g½±fis Fz¥¾lî«.

gF½ - I

Ñ³if©lt!z± bfhLj'f¥g£L's jft±SjF f£lª½± g½± mĒjfi«.

1. jft±

m. taJ : 12-13 13-14 14-15 15-16

M. ghĒd« : M© bg©

2. f±ÉªjF½

m«kh: gojfhjt® bjhlj'fj±É

,ilÃiyj'f±É KJÃiyj'f±É

KJfiy¥g£l«

m¥gh : gojfhjt® bjhlfjff±É
 ,ilÃiyjff±É KJÃiyjff±É
 KJfiy¥g£l«

3. bjhÊ±

m¥gh : _____

m«kh : _____

4. tUkhd«

m) 5000 jF Fiwthf M) 5001 - 10,000

,) 10,000 m½fkhf

5. Ñ³jf©lti¿± c´s bghU£f´ c§f´ å£o± c´sdth v-W f£l±½± F¿¥¾lî«>

m) fÂÂ M) bjhiyjh£¼

,) fh® <) ,U rjfu thfd«

<) Ä½t©o c) cllgÆi¼ rhjd«

6. c§f´ å£o± vªj tifahd czîf´ c©Šå®f´>

m) fh-f¿f´ k£L«

M) v¥gthtJ mirt czîf´ k£L«

,) K!¿Y« mirt czîf´

<) irt czîf´ k£L« K£il

7. cŞf' FL«gα½± c's eg®fĒ→ czîj f£L¥ghLf' g!¿
¾-tUkhW

t. v©.	czî tiff´	½d«	thu« xU Kiw	thu« ,U Kiw	thu« ,-W Kiw
m)	jhÅaŞf´ : (v.fh. nfhJik/ mÇ¼)				
M)	gU¥ò tiff´				
,)	fh-f¿f´ : Ñiuf´/ fh-f¿f´				
<)	gh± kiW« ghĒ± ,UªJ »iljF« bghU£f´ (be-/ bt©bz-/ jß« jÆ®/ ghyhilj£o)				
c)	,Å¥ò tiff´ : lµ»ß«/ rhjny£				
C)	mirt czîf´ : khL/ Ū→/ nfhĒ/ ML/ K£il/ ,iwø¼				

gF½ II
th³if Kiw

Ñ³if©ldti¿± bfhLjifg£L's czîj f£L¥ghLf' k!W« cligÆi¼f' g!¿a nf'Éf'
bfhLjifg£L'sd. rÇahdtiw njªbjLªJ f£lª½± Åu¥òf.

1. cligÆi¼f':

1. c\$ř' g'ËjTİ\$řË± »iljF« Éisah£L neu\$řË± v→d tifahd Éisah£Lf' ÉisahLå®f'>

- | | | | |
|-------------|--------------------------|----------------|--------------------------|
| m) Til¥gªJ | <input type="checkbox"/> | M) fh±gªJ | <input type="checkbox"/> |
| ,) ó¥gªJ | <input type="checkbox"/> | <) k£il¥gªJ | <input type="checkbox"/> |
| c) ,wF¥gªJ | <input type="checkbox"/> | C) if¥gªJ | <input type="checkbox"/> |
| v) nfh-nfh | <input type="checkbox"/> | V) tisa¥gªJ | <input type="checkbox"/> |
| l) gªJ åRj± | <input type="checkbox"/> | x) k!wit _____ | |

2. v²tsî kÂ neu« Ú\$ř' ,ªj Éisah£il ÉisahLå®f'>

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|-------------|--------------------------|---------|--------------------------|
| m) 1/2 kÂ | <input type="checkbox"/> | M) 1 kÂ | <input type="checkbox"/> |
| ,) 1 ¹/² kÂ | <input type="checkbox"/> | <) 2 kÂ | <input type="checkbox"/> |

3. c\$ř' g'Ëj Tİ\$řË± xU thuª½± v²tsî Éisah£L tF¥ò »iljF«

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| m) 1 Kiw | <input type="checkbox"/> | M) ,U Kiw | <input type="checkbox"/> |
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4. Ú\$ř' c\$ř' g'ËjTİ\$řË± Éisah£L tF¥ò m±yhj neu\$řË± ÉisahLå®fsh>

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| m) M« | <input type="checkbox"/> | M) ,±iy | <input type="checkbox"/> |
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7. rÇahdtliw vGjî«

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å£o!F btËna ÉisahL« Éisah£L f´	m _____ M _____ , _____ < _____ c _____							

8. g´Ë KoªJ å£o!F tªjil¬ Éisah£L m±yhk± ntW
bghGJnghjFf´ c´sdth>

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m . oÉ gh®ªj±				
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,. ,ir nf£l±				
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c . oôr¬ br±Yj±				
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v. e©g®fSl¬ ÉisahLtJ				
V. ntW VjhtJ _____				

9. cšf' ÉLKiw eh£fË± m±yJ thu±½¬ ,W½ eh£fË± VjhtJ
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10. Ñ³;f©lt!¿± rÇahditfis vGjî«

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M _____				
, _____				
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c _____				

11. Ñ³;fhŠ« bra±fis br-tJ©lh>

m. el±j± M. ÚªJ±
 ,, XLj± <. Í«dhµoj(cl! gÆ!¼)
 c. nahfh C. irj»' X£l«
 x. eldkhLj± X. fuh±nj
 Xs. jÉu _____

12. Úšf' v²tsî ,ilbtËÆ± ,aj bra±fis br-»Ö®f' >

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2	XLj±								
3	nahfh								
4	ÚªJj±								
5	Í«ndµoj								
6	irj»' X£l«								
7	eldkhLj±								
8	fuhªnj								
9	mJ jÉu ____								

13. Úšf' g'ËjF vªgo br±å®f' >

- m. M£nlh/ fh®/ngUªJ/ ,U rjfu thfd« M. elªJ
 ,, jÅah® ngUªJ <. irj»'

14. cšf' T£oiF« cšf' g'ËjF« ,ilªg£l öu«v-d>

- m. 1 »nyh Ú£IUjF Fiwthf
 M. 1 »nyh Ú£l®
 ,, 1 »nyh Ú£IUjF m½fkhf

15. Úšf' filjF m±yJ e©g®fË- å£oiFø br±Y«nghJ vªj
 tifahd thfdªij cgnah»ªÖ®>

- m. elªJ
 M. M£nlh/fh®,U rjfu thfd«
 ,, ngUª½±
 <. irj»' (,U rjfu t©o)

23. Ñ³f©lt!W´ ÚŞf´ KjÈl« bfhL±J fij thŞFå®f´>
- | | | | |
|----------|--------------------------|-----------|--------------------------|
| m. g®f® | <input type="checkbox"/> | M. üL±µ | <input type="checkbox"/> |
| ., ¼¥µ | <input type="checkbox"/> | <. nk±óÇ | <input type="checkbox"/> |
| c. lµ»ß« | <input type="checkbox"/> | C. rhjny£ | <input type="checkbox"/> |
| v. m±th | <input type="checkbox"/> | V. nfj | <input type="checkbox"/> |
| l. Ô!h | <input type="checkbox"/> | x. k!wit | _____ |

24. v±jid Kiw ÚŞf´ thŞFå®f´>
- | | |
|----------------------------|--------------------------|
| m. ½dK« | <input type="checkbox"/> |
| M. thu±½± 3 eh£fSjF Fiwthf | <input type="checkbox"/> |
| ., thu±½± 3 eh£fSjF m½fkhf | <input type="checkbox"/> |
| <. k!wit | _____ |

25. ÚŞf´ btËÆÈUªj FË®ghdŞf´ thŞ» Fo¥Ô®fsh>
- | | |
|------------------------|--------------------------|
| m. ghÈ± br-j FË®ghdŞf´ | <input type="checkbox"/> |
| M. FË®ghdŞf´ | <input type="checkbox"/> |
| ., gHçrhWf´ | <input type="checkbox"/> |
| <. nk® | <input type="checkbox"/> |
| <. fU«òçrhW | <input type="checkbox"/> |
| c. ,sÚ® | <input type="checkbox"/> |
| C. k!wit | _____ |

26. v±jid Kiw ÚŞf´ thŞFå®f´>
- | | |
|----------------------------|--------------------------|
| m. ½dK« | <input type="checkbox"/> |
| M. thu±½± 3 eh£fSjF Fiwthf | <input type="checkbox"/> |
| ., thu±½y 3 eh£fSjF m½fkhf | <input type="checkbox"/> |
| <. k!wit | _____ |
