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MESSAGE FROM **MS. SEEMA MODI,**

MANAGING DIRECTOR, HEINZ INDIA PRIVATE LIMITED



It might be prudent to term obesity a pandemic, because a billion people are affected worldwide. Malnutrition due to under-nourishment was bothering the authorities till recently, but in today's context obesity is creating far more anxiety as it is caused, largely, by intake of wrong foods. It is more of a perplexing anxiety because obesity in children is the trigger, and an obese child today, is surely bound to become an obese adult tomorrow. Apart from obesity being attributed to reduce the life expectancy, it makes the individual predisposed to medical complications.

The general belief in many people that obesity is a genetically developed abnormality is not totally correct, as scientific studies, medical and nutrition knowledge tells us that it as much an induced condition, which could have been avoided with correct information and regulated food intake. It is needless to emphasise that the lifestyle of children has to be stream-lined to provide sufficient time for physical exercise in the open air. While TV watching and playing computer games cannot be totally avoided in modern times, yet some amount of discipline should be ensured to promote and inculcate outdoor exercise in every child.

Dr. Avula Laxmaiah, Deputy Director (Scientist E), HoD, Division of Community studies and O/I, National Nutrition Monitoring Bureau, National Institute of Nutrition, ICMR, Hyderabad, had written an article on **Childhood obesity and its prevention strategies**. He had worked in the research area of childhood obesity doing extensive epidemiological and school intervention studies. It is an article with so much of systematic study background, that it is worthwhile to note that one single factor like increased time of TV watching could be triggering the increase in obesity in children. He says "... In spite of increase in participation in sports and games (indoor and outdoor), the prevalence of overweight and obesity had increased. Even though there was no change in the proportion of children who participated in TV watching, the duration of time spent in watching television was significantly increased over a period of time (2003: 1.4hours/day; 2011: 2.1hours/day)".

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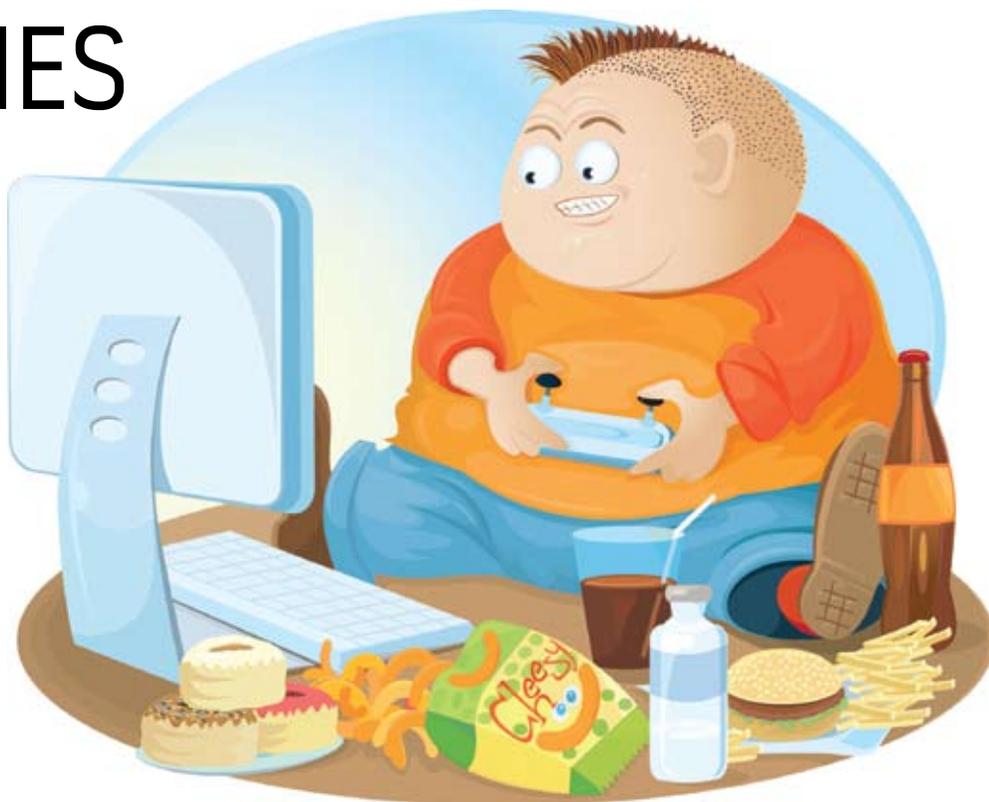
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CHILDHOOD OBESITY AND ITS PREVENTION STRATEGIES



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INTRODUCTION

A significant increasing trend in the prevalence of overweight and obesity has been documented over the last few decades in the developed as well as in the developing countries^{1,2}. Several studies carried out globally also indicate a rise in overweight and obesity both in children and adolescents. Because of rapid transition in socio-economic status, nutrition and lifestyles, more than 1.1 billion adults were overweight, (BMI ≥ 25) and at least 300 million of them were clinically obese (BMI ≥ 30)³. In almost all the developing countries, the overweight/obesity are often coexists with undernutrition and the condition is known as 'double burden of disease'. This condition probably persists at country, state, district, sub-district, community and even at individual level. Some overweight and obesity individuals may suffer from double burden of diseases i.e., micronutrient undernutrition and overweight. The rising prevalence of obesity in developing countries is largely also due to rapid urbanization and mechanization, wherein reduction of energy expenditure and increased intakes of energy may happen because of increase in purchasing power and availability of high fat, energy-

dense fast foods. The prevalence of overweight/obesity in urban children in Delhi has shown an increase from 16 per cent in 2002 to about 24 per cent in 2006. The consequences of obesity are insulin resistance, type 2 diabetes mellitus (T2DM), dyslipidemia, hypertension, cardiovascular diseases, metabolic syndrome, gastro intestinal, breast, ovarian and endometrial cancers etc. The consequences that are associated with childhood obesity are carried over to their adult life. Thus the most significant long-term consequences of childhood and adolescent overweight and obesity are its persistence even in adulthood with all the attendant health risks⁴⁻⁶.

For any level of body mass index (BMI) in Asia, Indians have a higher proportion of body fat percentage and lower muscle mass compared to their counter parts of Europeans and Caucasians in USA. Because of these body composition attributes, Asian Indians may develop more in insulin resistance, metabolic syndrome

and T2DM even in the individuals who are in low BMI levels⁷. About one-third of overweight or obese Asian Indian children have insulin resistance and at least one-fourth of overweight and obesity individuals may suffer from at least two cardio-metabolic risk factors. Important independent risk factors for development of T2DM in Asian Indians, especially young adults were hypertriglyceridemia, high waist-to-hip ratio, and family history of diabetes. High levels of C-reactive protein (CRP) levels predict future risk of T2DM and CHD. In Asian Indian adolescents, high CRP levels were seen in 13 per cent subjects overall, 22 per cent were overweight and 25 per cent with excess body fat. CRP levels have shown a direct association with percentage of body fat⁸.

Several cross-sectional studies in Western countries have shown that overweight and obese adolescents are less physically active than non-obese, physical inactivity, high socio-economic background, dietary transition was found to be major

factors⁹⁻¹¹. However, scanty studies were carried out only in few of the studies and very few studies were available to assess the time trends. Therefore, the National Institute of Nutrition, division of community studies has carried out a series of studies to assess its magnitude, determinants and trends of overweight and obesity among children and associated factors such as socio-economic status, occupation, literacy status of parents, physical activities, participation in sports and games, physical in-activities like watching TV, playing computer/video games, dietary behaviours among adolescents of Hyderabad and the rest of South India.

METHODOLOGY

STUDY 1 (2003-04)

This cross sectional and institutional study adopted a multistage stratified sampling procedure. The sample size covered was 1208 adolescents of 12-17 years from three types of schools i. e., government (36.2 per cent adolescents), semi private (19.3 per cent) and private (44.5 per cent), from a total of 23 institutions, which cater mostly adolescents of low, middle and high socio-economic background respectively 10 (Laxmaiah, et al 2007) in Hyderabad. Hyderabad is the capital city of Andhra Pradesh, established four hundred years ago (1591-92), on Deccan plateau 541 meters above sea level and sprawls over an area of 260 km. Now-a-days Hyderabad is making great strides in information technology and telecommunication, attracting multinational companies and foreign investments and performing the out source work. Hyderabad cuisine is largely dominated by biryani, which is a rich preparation of meat cooked with flavoured rice and aromatic spices. Number of fast food and junk food courts, like McDonalds, Pizza Huts, etc., have been established in many areas of the city. The study protocol was approved by the Institutional Ethical Review Board (IRB), written consent was also obtained from the heads of the educational institutions and while oral informed consent was obtained from all the adolescents. The household socio-economic and demographic data such as community, literacy status, occupation of father and mother were collected from the adolescents and the same was confirmed with the school records. The ages were taken from the date of birth recorded in the school register or self reported by older children¹².

After removing heavy clothing, belts and shoes all the adolescents were weighed using a standard SECA electronic weighing scale, with an error of ± 100 gms. The machine was regularly checked using test weights. A portable anthropometric rod was used for measuring the height, with an error to the nearest of 0.1cm, using standard protocols. Based on the weight and height, the body mass index (BMI) was calculated using the formula $BMI = Wt (Kg)/Ht (m)^2$. The International Obesity Task Force (IOTF) references were used to define overweight and obesity in the present study¹³.

ANALYSIS OF DATA

Data was analyzed using SPSS for Windows version 14.0 Inc. Chicago, IL USA. Adolescents were categorized into two groups i.e. Non-overweight (< 85th percentile) and Overweight (≥ 85 th percentile) using age and sex specific percentiles of BMI. Watching TV is categorized into none, <3h/day, and ≥ 3 h/day. Similarly, other variables like physical activities, aerobic activities, etc. were also categorized. According to age, gender, socio-economic, ethnic groups, type of school, physical activity level, the prevalence of overweight and obesity was calculated.

STUDY 2 (2006-07)

It was also a cross sectional nested case control study that adopted a multistage random sampling procedure. The subjects were urban adolescent School/Junior College Children in the age group of 12-17 years in the state of Andhra Pradesh. The enrolment ratio in the urban schools and junior colleges of Andhra Pradesh was about 90 per cent. Therefore, subjects were selected from the schools and junior colleges, managed by government, aided and private, which provided adolescents of different socioeconomic strata.

The sample covered was 7,905 children from all the three regions of Andhra Pradesh. However, the assessment of correlates was carried out among cases (overweight and obese adolescents) and doubles the number of matched controls (non-overweight subjects). The matching was done for region, type of school, age and gender and type of occupation of father. In each class, wherever more than one section existed, one section was selected randomly and about 20 boys and 20 girls were covered randomly for the present study. For data collection and data analysis, a similar

procedure was followed as was done in the study (1)¹⁴.

STUDY 3 (2011-12)

In this study also a cross sectional and multi-stage random sampling method was adopted. A total of 2,257 adolescents (boys: 1276; girls: 981) were covered from 20 randomly selected private schools of Greater Hyderabad Municipal Corporation (GHMC), Hyderabad, Andhra Pradesh. Selection of samples and data collection was carried out in similar procedures as followed in the study (1)¹⁵.

RESULTS

SOCIOECONOMIC PROFILE

STUDY 1

About 41 per cent of the adolescents in the age group of 12-17 years belonged to other backward communities, while 19 per cent belonged to either Scheduled Caste or Scheduled Tribes. The major occupation of father was either service (48.3 per cent) or business (27.8 per cent). Majority of the adolescents (82.5 per cent) were residing in their own houses. About two third of adolescents (69 per cent) were living in pucca houses, while about 24 per cent in semi-pucca houses.

STUDY 2

Over all, about 44 per cent of adolescents in the age group of 12-17 years belonged to other backward communities (OBCs) and a fifth of them were Scheduled Caste/Tribes (19.4 per cent). In general, about half of adolescents' father occupation was either service (30.4 per cent) or business (20.7 per cent), followed by labourers (38 per cent), artisans (5.9 per cent) and others (5 per cent). Majority of the adolescents (86.5 per cent) were residing in their own houses. About two third of adolescents (60.7 per cent) were living in pucca houses, while about 29 per cent in semi-pucca houses.

STUDY 3

A total 2,257 adolescents in the age group of 10-15 years (boys: 1276; girls: 981) were covered from 20 randomly selected private schools of Greater Hyderabad Municipal Corporation (GHMC), Hyderabad, Andhra Pradesh. More than two thirds of the adolescents (64.6 per cent) belonged to forward communities, while one fourth belonged to backward communities (26 per cent) and rest of them were either scheduled caste (8.2 per cent) or

scheduled tribes (1.2 per cent). Almost all adolescents (87.9 per cent) were living in pucca houses. No significant gender differentials were observed and two thirds of adolescents were living in their own houses (64.4 per cent), while rest of them was living in rented houses (35.6 per cent).

There were no significant differences observed between the subjects of above three studies.

The average age of the subjects covered was 13, 14, and 15 years in all the three periods of time. In all the three periodic studies, the coverage of girls was about 52-55 per cent. The proportion of children participated in indoor games was significantly increased over a three time periods (2003: 56.3 per cent; 2006-07: 89.3 per cent; 2011: 89.8 per cent). Similarly, the proportion of children also significantly over a period of time (2003: 52.8 per cent; 2006-07:60.5 per cent; 2011:87 per cent). The proportion of children who were watching television was more or less same during all the three periods of time that proportion was above 80 per cent and surprisingly no change was observed in the proportion of children who were performing physical exercise regularly. The mean BMI of the boys was increased over all the three periods (2003: 17.4; 2007: 17.6; 2011: 17.8) and similar trend was also observed among girls (2003: 18.2; 2007: 18.4; 2011: 17.8).

The mean BMI was significantly higher among girls compared boys (Table 1). The mean BMI was also higher among the

children, whose father was in service in all the time periods. There was a significant difference observed in the mean BMI among children of different socio-economic status of the households they belonged.

PREVALENCE OF OVERWEIGHT/OBESITY AND TIME TRENDS

The prevalence of overweight among children significantly increased from 6 per cent in 2003, 9 per cent in 2007 and 12 per cent in 2011, while the prevalence of obesity observed in 2003 and 2007 was no change and however there was an

increase observed in 2011 (2.3 per cent) (Fig.1). In spite of increase in participation in sports and games (indoor and outdoor), the prevalence of overweight and obesity was increased. Even though there was no change in the proportion of children participated in TV watching, the duration of time spent in watching television was significantly increased over a period of time (2003: 1.4hours/day; 2011: 2.1hours/day).

DISCUSSION AND CONCLUSIONS

Perhaps, this is one of the first trend

FIG 1: THE PREVALENCE OF OVERWEIGHT AND OBESITY AMONG URBAN ADOLESCENTS BY TIME TRENDS

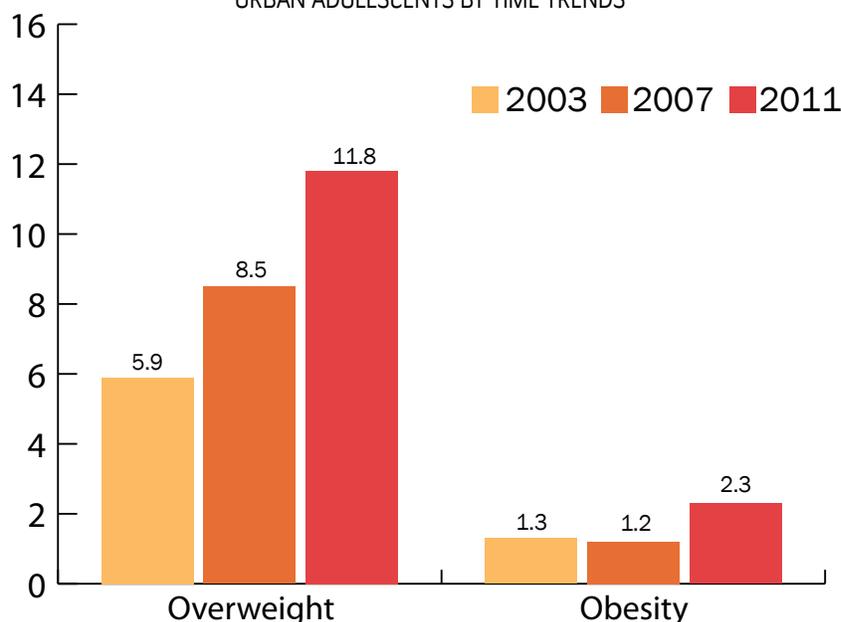


TABLE 1 TIME TRENDS IN DIFFERENT VARIABLES OF THE SAMPLE

VARIABLES	STUDY 1 (2002-03)	STUDY 2 (2006-07)	STUDY 3 (2010-11)
N	1208	7905	2,257
Mean age in years	14.5	13.5	12.6
Sex (per cent of girls)	51.5	52.5	56.5
Participation in Games and sports (per cent):			
Indoor	56.5	69.3	89.8
Out door	52.8	60.5	87.0
Television watching (per cent)	88.2	80.0	98.0
Physical exercise (per cent [^])	39.2	47.8	48.2
Mean BMI (95 per cent, CI):			
Boys	17.4 (17.2, 17.7)	17.6 (16.4, 18.2)	17.8 (17.2, 18.4)
Girls	18.2 (18.3, 18.9)	18.4 (17.4, 18.9)	18.6 (17.8, 18.8)
Subject's family - father occupation (Mean BMI):	17.8 ± 3.21	17.6 ± 2.77	18.1 (17.8, 18.6)
Socioeconomic status:			
Low	17.2 (16.9, 17.5)	17.4 (16.4, 17.4)	17.6 (17.0, 17.8)
High	18.0 (17.6, 18.6)	18.2 (17.6, 18.8)	18.4 (17.6, 19.1)
Duration of hours of watching television (hours/day)	1.4 (1.1, 2.1)	1.6 (1.2, 2.3)	2.1 (1.6, 2.8)
Overweight prevalence IOTF definition (per cent and 95 per cent, CI)	5.9 (4.6, 7.2)	8.5 (7.3, 9.6)	11.8 (9.8, 12.7)
Obese prevalence IOTF Definition (per cent and 95 per cent, CI)	1.3 (0.7, 1.9)	1.2 (0.6, 1.8)	2.3 (1.8, 2.9)

studies in India attempted to document the change in the prevalence of overweight and obesity as well its associated factors among urban adolescents in South India. The over all prevalence of overweight and obesity (\geq 85th percentile) among the urban adolescents increased over a period of time. Very few studies carried out in India also showed an increase in the prevalence of obesity as shown in the present study. The prevalence was, however, comparable with the figures reported in the other developing countries¹⁶⁻¹⁸. The prevalence was marginally higher among the girls as compared to the boys ($P > 0.05$), which was also observed in the many international studies.

A clear socio-economic gradient in the prevalence of overweight and obesity was observed in the present study, which is consistent with the other studies¹⁹. This could be because of several attributes, which are related to obesity, encountered to a greater extent in higher income groups. The diets of the children in the higher socio-economic group are known for their higher fat content and the subjects are involved in more sedentary activities. Studies have reported earlier that the raise in the sedentary pursuits like increase in the sedentary pursuit and decrease in physical activity have led to increase in the prevalence of overweight and obesity. There were significant changes observed in the present study.

The results clearly revealed that regular physical activity even in simple activities like participation in the household activities and outdoor games could reduce prevalence of overweight and obesity. The prevalence was significantly lower in the children who participated regularly in the household activities ($p < 0.001$), outdoor games and physical exercises. These observations are consistent with the results of previous studies. The major conclusion drawn from this study is that the prevalence of overweight and obesity was increased in spite of increase in the physical activities as well as increase in the sedentary activities such as participation in indoor games and sports, participation in television watching and using more of vehicular transport.

Therefore, role of physical activity, games and sports should be emphasized and facilities should be provided for outdoor games in schools with compulsory hours of sports and games. There is an urgent need to educate the urban community on the

aspects of healthy food habits and desired life styles, so as to prevent overweight and obesity.

ACKNOWLEDGEMENTS

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GENES IDENTIFIED FOR COMMON CHILDHOOD OBESITY

An international collaborative study including researchers from The University of Western Australia has identified at least two new gene variants that increase the risk of common childhood obesity.

The largest-ever genome-wide study of common childhood obesity was conducted by the Early Growth Genetics (EGG) Consortium and considered a broad range of children including data from the Western Australian Pregnancy (Raine) Cohort.

“Previous studies have focused on more extreme forms of obesity primarily connected with rare disease syndromes, while this study includes a broader range of children. “We have identified and characterized two new genetic variants that are associated with a predisposition to common childhood obesity”

The current meta-analysis included 14 different research groups encompassing 5530 cases of childhood obesity and 8300 control subjects of normal weight, all of European ancestry. The study team identified two novel loci, one near the OLFM4 gene on chromosome 13, the other within the HOXB5 gene on chromosome 17. They also found a degree of evidence for two other gene variants. None of the genes were previously implicated in obesity.

Scientific Director of the Raine Cohort UWA Associate Professor Craig Pennell said the study published online in Nature Genetics was the first of its kind.

“Previous studies have focused on



more extreme forms of obesity primarily connected with rare disease syndromes, while this study includes a broader range of children.

“We have identified and characterized two new genetic variants that are associated with a predisposition to common childhood obesity.”

Established research indicates that obese adolescents tend to have a higher risk of mortality when they are adults. Although environmental factors, such as food choices and sedentary habits, contribute to the increasing rates of obesity in childhood, twin studies and other family-based evidence have suggested there is a genetic component as well.

Previous studies have identified gene variants contributing to obesity in adults and in children with extreme obesity but relatively little is known about genes implicated in regular childhood obesity.

“This work opens up new avenues to explore the genetics of childhood obesity”, Associate Professor Pennell said. “A great deal of work remains, however, these findings may ultimately be useful in helping

to design preventive interventions and treatments for children, based on their individual genomes.”

The Raine Study is the largest well-characterised pregnancy cohort in the world and is conducted jointly by the UWA School of Women’s and Infant’s Health and the Telethon Institute for Child Health Research. The study recruited 2900 pregnant women between 1989 and 1991 prior to 18 weeks gestation at King Edward Memorial Hospital in Perth, and their children have been documented over the last 21 years.

The study “A genome-wide association meta-analysis identifies new childhood obesity loci” was funded by The National Health and Medical Research Council of Australia and the US National Institutes of Health.

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NUTRI LIFE CLINICS

BY DR. P. JAGANNIVAS

DIRECTOR HNFI

We have three Nutri Life Clinics being operated in India- Chennai, Bengaluru and Delhi. They are sponsored by Heinz Nutrition Foundation India as part of their Continued Nutrition Education activity. Three popular and leading nutritionists and dieticians of the respective cities are consulting at these clinics. They are Dr. Dharini Krishnan, Ms. Sheela Krishnaswamy and Dr. Neelanjana Singh respectively. The people who come to these clinics on appointment get free consultation and nutrition counselling from these nutritionists.

I am pleased to inform that our nutrition consultant at Nutri Life Clinic run by HNFI at Chennai, Dr. Dharini Krishnan is one of the persons invited for giving the key note address at the 16th International Congress of Dietetics at Sydney, Australia on 5-8 September 2012. Ms. Sheela Krishnaswamy our nutrition consultant at Nutri Life Clinic at Bengaluru co-chaired two sessions as an ICDA Board Member. We are proud to be associated with them.

Dr. Dharini Krishnan had sent us a small report about her talk, based on our request which is presented below.



→ Double burden of Malnutrition

- Researchers
- Educators
- Dieticians at schools. Working with the canteen and food issues related to children



DR. DHARINI KRISHNAN

DR KRISHNAN IS A CONSULTANT DIETITIAN AT HER CLINIC AT MYLAPORE, CHENNAI. SHE WAS THE NATIONAL PRESIDENT INDIAN DIETETIC ASSOCIATION TILL DECEMBER 31ST, 2010. SHE WAS ALSO A CONSULTANT AT WWW.SITAGITA.COM, GIVING ONLINE DIET ADVICE AND SECRETARY AND INVOLVED WITH ECOSCIENCE RESEARCH FOUNDATION AND WORKING TOWARDS THE ORGANIC MOVEMENT. SHE CONSULTS AND COUNSELS PATIENTS FOR TWO HOURS A DAY FOR FIVE DAYS A WEEK AT NUTRI LIFE CLINIC.

DIETITIANS AS LEADERS

A leader is a person who influences a group of people towards achievement of their goals. Someone who leads, guides and inspires a group of followers. Leadership has been described as: “a process of social influence in which one person can enlist the aid and support of others in the accomplishment of a common task”.

Leadership is a process by which an individual influences a group of individuals to achieve a common goal. The purpose, person and people are linked to achieve a common goal. A leader should be able to motivate, to achieve larger goals, be able to pool strengths of a team of people. Leading means setting a direction, aligning people, motivating and inspiring.

Areas where dieticians can be leaders are:

- Changes in the Food and Nutrition Policy
- Be health promoters and prevent chronic diseases
- Providing safe foods for all
- Farm to fork- Such programmes will help self-help groups, where their products can be transported
- Nutrition Health Policy planners
 - Organic Products

The different roles that dieticians can play could be as:

- Entrepreneurs
- Business owners

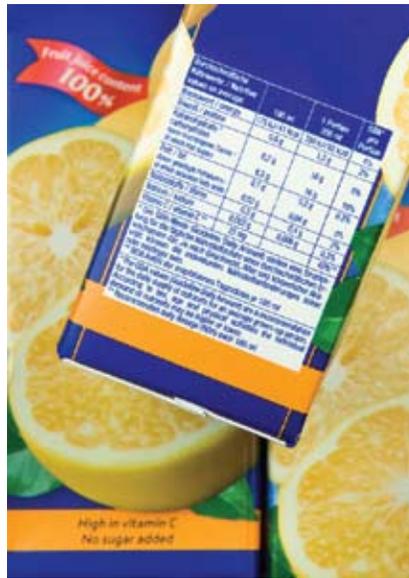




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CHILDHOOD OBESITY IS PERMANENT

Indians have higher proportion of body fat with lower muscle mass as compared to western counterparts. This has been aptly described as “thin fat adult”. Thus we Indians are genetically at higher risk of obesity. Childhood obesity persists into adult life with all the attendant health risks and hence it is important to prevent childhood obesity. The study conducted in Hyderabad by Dr. Laxmaiah over the last eight years has shown doubling of prevalence of overweight and obesity in older children. This is mainly due to change in life style especially in urban children with sedentary habits and access to calorie-dense food. Obesity is catching up even in rural children. While under nutrition continues to contribute to poor health in Indian children, obesity is a dual burden. Worst is the fact that many obese children are deficient in micronutrients – coexistence of under nutrition and over nutrition in the same child.



- Consultants in Private practice
- Poly clinics of dietitians
- Dietitians at Department stores
 - i. Teach the Right choices of foods to people
 - ii. Teach to read Food labels

How a dieticians can become a leader would be:

- a. Acknowledge and accept one’s own strength and weakness. Recognise the strengths and use it and strengthen the weaknesses.
- b. Has to be technically proficient. Has to update one’s knowledge, evidence based practice should be followed.
- c. Build responsibility in the team members.
- d. One should become that change that one wishes to see in others.
- e. There should be trust, empathy and genuine communication among the leader and the team members.
- f. There should be a common shared vision for example achieving the best department in the hospital. Instill this drive in the members and inspire them to achieve this goal.
- g. For ensuring that the tasks are understood, supervised and accomplished. Weekly and daily charts

of targets achieved can be maintained. Client satisfaction can be a good measure of checking the results of the work done.

The six leadership styles are Coercive, Authoritative, Affiliated, Democratic, Pacesetter and Coaching. Effective leader’s use combinations of the six leadership styles depending on the people and situation involved.

The examples that can be used in Community Dietetics are sending out SMSes and Blogs on a daily basis. There are startling experiences where providing nutrients which changed the map of under-nutrition for example in the case of folate in pregnant women or vitamin A deficiency or micro-nutrient deficiency. Media, both TV and print media can be used as an aggressive mode for dissemination of nutrition information, to create nutrition awareness in the public. This is already happening with many corporate adopting this method. Even telemedicine is using these technologies to give alerts of appointments, reminders to take medications etc.

Hence dieticians who turn to be leaders can achieve path breaking success in their area of practice.

(Keynote address at the International Conference of the International Confederation of Dietetic Associations in September 2012)



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