Diabetes and Obesity in India:
Focus on Lifestyle of Young Individuals

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Chairman.
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Chairman, National Diabetes, Obesity and Cholesterol Foundation (N-DOC)
Director, Diabetes Foundation (India)
Honorary Professor, Institute of Life Sciences, Hyderabad
Member, WHO Expert Group on Childhood Obesity
Former Faculty, Endocrinology, The University of Texas
Awarded Padma Shree by President of India, 2007
The Diabetes Tsunami
Nearly 51 Million Indians are Suffering from Same Deadly Disease: The Tide is Still Rising

- Most rapidly increasing (150% over next 15 year) of all diseases.
- More than 7% Indians have diabetes, at par with Australia and more than UK.
- Diabetes will kill nearly one million people in India this year.
Secular Trends in Prevalence of Overweight and Obesity from 2006 to 2009 in Urban Asian Indian Adolescents Aged 14-17 Years

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Original Research
Imbalanced Dietary Profile, Anthropometry, and Lipids in Urban Asian Indian Adolescents and Young Adults

Nidhi Gupta, MBBS, Priyali Shah, PhD, Kashish Goel, MBBS, Anoop Misra, MD, Kaity Raisingh, MSC, Naval K. Vikram, MD, Vidya Kumar, MBBS, Ravindra M. Pandey, PhD, Dipak Koulial, PhD, Jasjeet S. Wad, MD, Swati Bharadwaj, MSc, Seema Gulati, PhD
National Foundation for Diabetes, Obesity, and Cholesterol Disorders (N-DOC), Diabetes Foundation (India) (P.S., A.M., S.B., S.G.); Department of Diabetes and Metabolic Diseases, Fortis Hospital (A.M., K.R., J.S.W.); Departments of Medicine (V.K.), and Biochemistry (R.M.P., D.R.); All India Institute of Medical Sciences, New Delhi, NIDDK, Endocrine Research Unit, Division of Endocrinology (K.G.); and Division of Cardiovascular Diseases (K.G.), Mayo Clinic, Rochester, Minnesota

Key words: adolescents, Asian Indians, dietary fat, saturated fats, obesity
Age-wise Prevalence Trend of Risk Factors
Males, n=1009

The average age of onset of diabetes in Indians is a decade earlier than other races. Many are in late 20s.
Prevalence of Insulin Resistance (by HOMA-IR) in Post-pubertal Asian Indian Children (n=396)

Overall Prevalence: Males, 21.8%, Females, 35.8%

M isra et al., IntJ Obesity, 2004
The New York Times
Sunday, December 31, 2006
India Prosperity Creates Paradox.
Many Children Fat, Even More Famished
By Somini Sengupta

A continuing study by Professor Anoop Misra, New Delhi, found that ranks of obese had jumped sharply in last two years, from 16% to 29%
Longitudinal Studies in Children: Key Observations

- ~77% of obese children will be obese adults.
- Multiple cardiovascular risk clustering persists from childhood to adulthood.
- Hyperinsulinemia & insulin resistance in childhood predict cardiovascular risk in adulthood.
The Roadmap to Avoid Diabetes, Death and Destruction

Inadequate nutrition, high blood pressure, obesity, low physical activity, stress, and lack of sleep

Intra-uterine period → Birth → Childhood → Adult hood → Physical inactivity/imbalanced diet

Genetic influence

Diabetes → Heart attack → Death

267 years → 88 years → 4100 years
Catching Them Young
The Knowledge
Knowledge Regarding Unhealthy Diet and Diseases among Children

Gulati, S; Misra A. Unpublished Data. 2010
Knowledge Regarding Unhealthy Diet and Diseases among M others

Gulati, S; Misra A. Unpublished Data. 2010
Catching Them Young
The Attitude
Any New Year's Resolutions, Garfield?

To stop eating junk food, and to exercise every day.

And to curb my inessant living.
Attitude of Children towards Eating Habits

- 51% children consider HomeMade food as “Old Fashioned”
- 43% children consume Junk Foods because according to them it is the “In thing”
- 68% children say interesting advertisements “inspire” them to purchase junk foods.
- 73% children Snack while watching television.
- 61% children tend to eat more when they are “lonely”.

Gulati, S; Misra A. Unpublished Data.2010
“I like Fast Food Joints, Because...”

✓ “It is a happening place”, 32%
✓ “It is fashionable”, 25%.
✓ “I saw advertisement”, 68%

Gulati S, Misra A. Project TEACHER, Unpublished
Catching Them Young
The Practice
## Consumption of Lifestyle Foods among Children

<table>
<thead>
<tr>
<th>Item</th>
<th>Younger children</th>
<th>Older Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chips/ Pringle</td>
<td>68</td>
<td>66</td>
</tr>
<tr>
<td>Popcorn</td>
<td>33</td>
<td>28</td>
</tr>
<tr>
<td>Soft Drinks</td>
<td>30</td>
<td>41</td>
</tr>
<tr>
<td>Ice-Creams</td>
<td>44</td>
<td>58</td>
</tr>
<tr>
<td>Cakes/muffins</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Chocolates</td>
<td>71</td>
<td>75</td>
</tr>
<tr>
<td>Deep fried Food</td>
<td>40</td>
<td>57</td>
</tr>
<tr>
<td>Fast Food (Pizza/burger)</td>
<td>22</td>
<td>31</td>
</tr>
</tbody>
</table>

Gulati, S; Misra A. Unpublished Data. 2010
### Consumption of Lifestyle Foods among Mothers

<table>
<thead>
<tr>
<th>Item</th>
<th>Mothers of Younger Children</th>
<th>Mothers of Older Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chips/Pringle</td>
<td>53</td>
<td>57</td>
</tr>
<tr>
<td>Popcorn</td>
<td>29</td>
<td>36</td>
</tr>
<tr>
<td>Soft Drinks</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>Ice-Creams</td>
<td>43</td>
<td>48</td>
</tr>
<tr>
<td>Cakes/muffins</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td>Chocolates</td>
<td>47</td>
<td>57</td>
</tr>
<tr>
<td>Fried Food</td>
<td>39</td>
<td>38</td>
</tr>
<tr>
<td>Fast Food</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

> 2-3 times a week

Gulati, S; Misra A. Unpublished Data. 2010
Frequency of Purchasing Food from Canteen by Children

58% of younger children and 72% of older children buy food from the canteen at least 3-4 times a week.

Ordering Food From Outside

47% of mothers order food from outside and 24% of mothers order at least once in 15 days for family.

Gulati, S; Misra A. Unpublished Data. 2010
Snacks in School Canteen
Foods Sold Outside the School by Vendors
The Kiosks in the school Premises
An Ideal Canteen of a School (Pune)
## Consumption of Trans Fatty Acids in Urban Adolescents and Adults in India (% Energy)

<table>
<thead>
<tr>
<th>Age group</th>
<th>Male Mean (SD)</th>
<th>Female Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-18 years (n 797)</td>
<td>1.1 (0-10.7)</td>
<td>1.1 (0-10.2)</td>
</tr>
<tr>
<td>Adults</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-49 years (n 325)</td>
<td>0.4 (0-4.1)</td>
<td>0.6 (0-9)</td>
</tr>
<tr>
<td>&gt; 50 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n 124)</td>
<td>0.3 (0-6.2)</td>
<td>0.4 (0-6.8)</td>
</tr>
</tbody>
</table>

*Misra et al. British Journal of Nutrition 2008*
### Dietary Intake of Colas (g/d)

<table>
<thead>
<tr>
<th>Food Groups</th>
<th>13 - 15 years</th>
<th>16 - 18 years</th>
<th>19 - 25 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (n=132)</td>
<td>Female (n=122)</td>
<td>Male (n=327)</td>
</tr>
<tr>
<td>Colas</td>
<td>43 (0-300)</td>
<td>64 (3-300)</td>
<td>43 (0-300)</td>
</tr>
</tbody>
</table>

Approximately 1.8 cans of cola per week (540 ml/wk) per person consumption was noticed (1 can [300 ml] 132 kcal and 33 - 40 g sugar)

Misra et al. J Am Coll Nutr. 2010
## Sedentary Activities among Children

<table>
<thead>
<tr>
<th>Activity more than 60 minutes/day</th>
<th>Younger children %</th>
<th>Older children %</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV viewing</td>
<td>70</td>
<td>85</td>
</tr>
<tr>
<td>Working on Computer</td>
<td>56</td>
<td>68</td>
</tr>
<tr>
<td>Video Games</td>
<td>54</td>
<td>56</td>
</tr>
</tbody>
</table>

Gulati, S; Misra A. Unpublished Data. 2010
Catching Them Young
The Roadblocks
Roadblock 1
Healthy Living? Not for me Dude!

72% children are not ready to cut down or restrict the intake of Junk Food
47% children unwilling to restrict TV viewing & take up some physical activity

Gulati, S; Misra A. Unpublished Data.2010
Roadblock 2

Exams (vacations): Eat more, no exercise

• 36% of younger children and 62% of older children increase munching between meals during exam days

• 65% of younger children and 71% of older children increase their intake of choice foods during vacations

Gulati, S; Misra A. Unpublished Data. 2010
Roadblock 3
Mom, I want That Finger Lickin’ Pizza!

58% of younger children and 56% of older children say that they are affected by advertisements for purchasing fast foods

Gulati, S; Misra A. Unpublished Data. 2010
## Roadblock 4
### Unfit mothers, can’t be Role Models

<table>
<thead>
<tr>
<th>BMI (Kg/m²)</th>
<th>Mothers of Younger Children (N=600)</th>
<th>Mothers of Older Children (N=1200)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>=23</td>
<td>202</td>
<td>34</td>
</tr>
<tr>
<td>23.1-25.0</td>
<td>156</td>
<td>26</td>
</tr>
<tr>
<td>25.1-29.9</td>
<td>200</td>
<td>33</td>
</tr>
<tr>
<td>=30</td>
<td>42</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Gulati, S; Misra A. Unpublished Data. 2010
70% of students in class 10 and 12 are sedentary. Can we change these habits?
Catching Them Young
The Interventions
British J Nutrition, 2010

Improvement in nutrition-related knowledge and behavior of urban Asian Indian school children: findings from Multi-center Collaborative MARG intervention study

Improvement in Knowledge & Behaviour after Intervention: The MARG Study

(a) Improvement in knowledge score after intervention (%)

(b) Improvement in behaviour score after intervention (%)

Age (years)

8–11 12–14 15–18

0 20 40 60 80 100 120 140
ORIGINAL ARTICLE

Effects of controlled school-based multicomponent model of nutrition and lifestyle interventions on behavior modification, anthropometry and metabolic risk profile of urban Asian-Indian adolescents in North India

N Singhal¹, A Misra¹,², P Shah¹ and S Gulati¹

¹Centre for Diabetes, Obesity and Cholesterol Disorders (C-DOC), Diabetes Foundation (India), New Delhi, India and ²Department of Diabetes and Metabolic Diseases, Fortis Hospital, New Delhi, India
Table 1 Characteristics of multi-component model of nutrition and lifestyle interventions

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissemination of health-related information through lectures and focused group discussions</td>
<td>The lifestyle intervention included 24 weeks (6 months) of nutrition education. Initial 6 weeks were used for introduction of program to the school and for collecting baseline data. Subsequent 18 weeks were used for intensive and repetitive nutrition education to all the eleventh-grade students. The students were given lectures in batches of 30 in each class in 30 min of session each week for 10 weeks on the basics of food groups; importance of each food group for health; difference between simple and complex carbohydrates, concept of empty calories and its sources; importance of fiber in the diet; sources and adverse effects of trans-fats; sources of protein in the diet; harmful effects of consuming deep-fried, high-calorie Indian 'junk' food everyday; antioxidant and fiber content of fruits and vegetables; and importance of eating nuts. Emphasis was laid on the importance of every food group in the diet. Information on healthy cooking practices was also shared. In addition, knowledge of lifestyle-related diseases such as diabetes, CVD and hypertension was provided to them.</td>
</tr>
<tr>
<td>Promotion of physical activity</td>
<td>Children were encouraged to participate actively in physical activity periods in school every week for at least 30 min. They were informed of ways by which physical activity can be improved at home, such as by decreased television viewing, increased involvement in household chores, using walking as a means of travel to nearby destinations.</td>
</tr>
<tr>
<td>Other activities to promote healthy lifestyle</td>
<td>After 10 weeks of lectures and information dissemination, for the consecutive 8 weeks (30 min 5 days a week), children were involved in activities such as planning their own tiffin, planning a daily diet for themselves and listing healthy alternatives to high-calorie 'junk foods'. Quiz competition and extempore on health-related topics were also conducted during the activity periods.</td>
</tr>
<tr>
<td>Individual counseling</td>
<td>Individual counseling was held for an hour every week with the children by the trained nutritionist. They were counselled in groups of 4-5, and hence each child received individual attention. The children discussed their problems related to diet, lifestyle and physical activity. Hence each child received individual counselling of 1 h/week.</td>
</tr>
<tr>
<td>Policy-level changes in the school</td>
<td>A policy-level change was introduced in the school with the help of the school management. The school canteen menu was changed to healthier alternatives. The sale of aerated drinks and high-calorie foods, such as burgers, bread pakodas (deep-fried Bengal gram flour-coated bread slices) and noodles were stopped. Healthy Indian food providing satiety such as rajmah-chawal (bean curry and boiled rice) khichdi (Bengal gram flour and boiled rice), idli-sambhar (fermented and steamed rice and pulse flour and red gram dhal with vegetables) and brown bread cucumber sandwiches were made available. This was done to reduce the availability of unhealthy foods to children as well as to make the healthy lifestyle program sustainable in school.</td>
</tr>
<tr>
<td>Involvement of teachers and parents</td>
<td>A health camp was conducted in school for parents and teachers for the entire day during parent-teacher meeting where free nutritional counseling was provided to them by the trained nutritionist. They were given free of cost assessment of their body mass index, blood pressure and blood glucose by a physician and in addition, the parents of intervention children were telephonically contacted every month and were asked a set of standard questions pertaining to diet, lifestyle and physical activity of the child. Parents of each child were counselled for 5—7 min every month.</td>
</tr>
<tr>
<td>Training of student volunteers to sustain the program</td>
<td>An additional 1-h session was held every week with 40 student volunteers of eleventh grade. They were given instructions to disseminate the health messages to their peers and juniors. Activities such as skits in the morning assembly on nutrition-related topics such as harmful effects of 'junk' foods, healthy vs unhealthy lifestyle were held twice during the intervention program. Demonstration of recipes for healthy tiffin was done by them in the morning assembly on the occasion of World Food Day. Instructions were given to them to check and evaluate the tiffin of junior students each week and to counsel them to bring healthy tiffin each day. The children were given two demonstrations of healthy and easy-to-prepare snacks by their teacher as well as the nutritionist. Children were also asked to bring wrappers of foods such as biscuits, fruit juices, chocolates, ice-creams; and so on, and they were made to understand the nutritional and calorie content of these energy-dense food items.</td>
</tr>
</tbody>
</table>
% Decrease in Consumption Patterns of ‘Energy-Dense Foods’

<table>
<thead>
<tr>
<th>Consumption of Food Articles</th>
<th>Case School</th>
<th>Control School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweetened carbonated drinks &gt; 3 times/w</td>
<td>15.4%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Western ‘energy-dense’ foods (Burgers, pizzas, french fries, noodles) &gt; 3 times/w</td>
<td>9.2%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Chips/ Namkeen/Maggi &gt; 3 times/w</td>
<td>8.3%</td>
<td>No change</td>
</tr>
<tr>
<td>Indian ‘energy-dense’ food &gt; 3 times/w</td>
<td>6.3%</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

All differences are statistically significant

**Consumption of Fruits (brought in Tiffin)**

<table>
<thead>
<tr>
<th></th>
<th>Case School</th>
<th>Control School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>10.1%</td>
<td>29.8%</td>
</tr>
<tr>
<td>Follow-up</td>
<td>40.4% *</td>
<td>25.9%</td>
</tr>
</tbody>
</table>

*Statistically significant

% Change in Time Spent in TV Viewing and Physical Activity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Case School</th>
<th>Control School</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV Viewing &gt; 2 h/d</td>
<td>5.2% ↓</td>
<td>2.4% ↑</td>
</tr>
<tr>
<td>Physical Activity 30-60 min/d</td>
<td>9.8% ↑</td>
<td>3.7% ↑</td>
</tr>
</tbody>
</table>

All differences are statistically significant

% Change in Anthropometric Parameters

P < 0.05 in Control SAD
P < 0.001 in Case biceps

## % Change in Metabolic Parameters

<table>
<thead>
<tr>
<th>Variable</th>
<th>Case School</th>
<th>Control School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Glucose</td>
<td>-4.9% *</td>
<td>-2.2%</td>
</tr>
<tr>
<td>HDL -C</td>
<td>2.2%</td>
<td>-2.3%</td>
</tr>
</tbody>
</table>

*p < 0.001

% Change in Fasting Insulin Levels and Measures of Insulin Resistance and Beta-Cell Function after Intervention

Singhlal N, Misra A et al., Met Synd Relat Disord, 2010
Intervention Projects:

• CHETNA (“Awareness”): 10 schools in Delhi (With support of Rotary Club, New Delhi)

• TEACHER: Trends in Childhood Nutrition and Lifestyle Factors in India, Four cities (New Delhi, Agra, Bangalore, Pune)

• MARG (“ThePath”): Medical education for children/Adolescents for Realistic prevention of obesity and diabetes and for healthy ageing: North India, multiple cities

• DISHA (“Horizon”): 50 cities across India
“MARG” (The Path)

Project “MARG”: The Path
Medical Education for Children / Adolescents for Realistic Prevention of Obesity and Diabetes and for Healthy AGing

“Health Awareness Program for the Prevention of Obesity and Diabetes through Balanced Diet and Physical Activity”

Promoted by: Diabetes Foundation (India)
Funded by: World Diabetes Foundation

Principal Investigator: Prof. Anurag Misra, Director & Head, Department of Diabetes & Metabolic Diseases, Fortis Hospitals, New Delhi & Noida, WHO Expert in Childhood Obesity

Co-Investigator: Mrs. Rekha Sharmas, Former Chief Dietitian, All India Institute of Medical Sciences, New Delhi, Senior Vice President VLCC

Project “MARG”: The Path
A World Diabetes Foundation Project
Office of Project “MARG”: The Path and Diabetes Foundation India
C-6/D, Saket Enclave, New Delhi 110 017 (India)
Tel. No. +91-11-41949072 Email: info@worlddiabetesfoundation.org

DISHAA

Project Dishaa
(50 city Initiative)

Across 50 cities, nearly 70 top diabetologists/physicians/Nutritionists as leaders

Initiative of National Diabetes, Obesity, and Cholesterol Diseases Foundation & Emcure Pharmaceutical (India) Pvt. Ltd

March 5, 2011
M A R G: Principal Focus

"Change the Individual"
- Children
- Parents
- Teachers
- Public

"Change the environment"
- Home
- School
- Area around school

"Change the Individual"
"MARG" to Good Health
Eat Right
Stay Light &
Be Bright

Project "MARG": The Path
Medical Education for Children / Adolescents for Realistic Prevention of Obesity and Diabetes and for Healthy Eating
A Health Awareness Program for the Prevention of Obesity & Diabetes through Healthy Eating and Active Lifestyle
Promoted By: Diabetes Foundation (India)
Funded By: World Diabetes Foundation (Denmark)
Information, Education, and Communication Material

**CHOOSE HEALTHY... STAY HEALTHY!!!**

Good to Eat... ... Tough to Burn

Colas/Fruit Juices/ Canned Juices
Butter Popcorns
Pizza/Burger/ White Bread/Noodles
Ice-Creams/Ice-Cream Shakes/Puddings

The Healthy Way Out...

Whole Fruits/Lassi/Soy Milk/ Coconut Water etc.
Steamed Corns (Without Butter)
Brown Bread/Atta Noodles/ Wheat Porridge/Sprouts
Fruit Puddings/Fruit Salads /Skimmed Milk Shakes

*Project "Mary": The Path*

A World Diabetes Foundation Funded Project
Office of Project "Mary": The Path and Diabetes Foundation (India)
6-6G7, Shilajur Development Area, New Delhi 110 024 (India)
Tel: (91) 11-27998727 Telephone: (91) 11-27998727
Email: anujaspuria.mary@gmail.com
## YOUR CALORIMETER
Count your calories on daily basis and judge the adequacy of your diet.

<table>
<thead>
<tr>
<th>Food Items</th>
<th>Amount</th>
<th>Energy (Kcal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapatti</td>
<td>25g</td>
<td>65</td>
</tr>
<tr>
<td>Vegetable dry</td>
<td>1 Knot (100g)</td>
<td>77</td>
</tr>
<tr>
<td>Dal</td>
<td>1 Knot (50g)</td>
<td>100</td>
</tr>
<tr>
<td>Rice boiled</td>
<td>25g &amp; cup</td>
<td>66</td>
</tr>
<tr>
<td>Brown Bread</td>
<td>25gm</td>
<td>61</td>
</tr>
<tr>
<td>Cornflakes with milk</td>
<td>1 bowl</td>
<td>220</td>
</tr>
<tr>
<td>Egg (boiled)</td>
<td>1 (50g)</td>
<td>80</td>
</tr>
<tr>
<td>Apple (medium)</td>
<td>1 (100g)</td>
<td>92</td>
</tr>
<tr>
<td>Banana (medium)</td>
<td>1 (100y)</td>
<td>116</td>
</tr>
<tr>
<td>Gurd</td>
<td>1 Knot (100g)</td>
<td>75</td>
</tr>
<tr>
<td>Lassi (Chhupani)</td>
<td>1 glass</td>
<td>70</td>
</tr>
<tr>
<td>Mini Buffalo milk with 2 top sugar</td>
<td>250 ml (1 glass)</td>
<td>330</td>
</tr>
<tr>
<td>Tea (50 ml toned milk + 2 top sugar)</td>
<td>1 cup</td>
<td>60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Food Items</th>
<th>Amount</th>
<th>Energy (Kcal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noodles</td>
<td>1 Mt (100g)</td>
<td>435</td>
</tr>
<tr>
<td>Samosa</td>
<td>1 pcs</td>
<td>150</td>
</tr>
<tr>
<td>French fries</td>
<td>Large</td>
<td>300</td>
</tr>
<tr>
<td>Pizza (Cheese A Tantona)</td>
<td>1 Slices</td>
<td>280</td>
</tr>
<tr>
<td>Burger</td>
<td>1 piece</td>
<td>330</td>
</tr>
<tr>
<td>Brown Brand Sandwich</td>
<td>2 Slices</td>
<td>194</td>
</tr>
<tr>
<td>Brown Bread</td>
<td>25 gm  (4)</td>
<td>112</td>
</tr>
<tr>
<td>Butter popcorns</td>
<td>50 g (regular)</td>
<td>160</td>
</tr>
<tr>
<td>Chips</td>
<td>50 g (1 piece)</td>
<td>196</td>
</tr>
<tr>
<td>Biscuit</td>
<td>25 gm</td>
<td>112</td>
</tr>
<tr>
<td>Ice Cream Pops</td>
<td>1 Scoop (100g)</td>
<td>120</td>
</tr>
<tr>
<td>Paniyaram</td>
<td>1 pcs</td>
<td>500</td>
</tr>
<tr>
<td>Chocolate</td>
<td>1 Bar (35gm)</td>
<td>180</td>
</tr>
<tr>
<td>Asmpool (Soft) tea</td>
<td>1 Bottle 350ml</td>
<td>110</td>
</tr>
</tbody>
</table>

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### Are you at Risk of Overweight/Obesity

*Obesity* is the presence of excess fat in the body. The indicator of fatness is Body Mass Index (BMI).

#### CALCULATE YOUR BMI

**By Measuring Your**

- Height in Meters &
- Weight in Kilograms

Use the following formula to calculate your BMI:

$$\text{BMI} = \frac{\text{Weight in Kilograms}}{\text{Height (in Meters)}^2}$$

**CHECK IT NOW!!**

<table>
<thead>
<tr>
<th>AGE</th>
<th>At Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>21.5</td>
</tr>
<tr>
<td>15</td>
<td>21.9</td>
</tr>
<tr>
<td>16</td>
<td>22.7</td>
</tr>
<tr>
<td>17</td>
<td>22.8</td>
</tr>
<tr>
<td>18</td>
<td>23.2</td>
</tr>
</tbody>
</table>

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Project "Mangi" - The Path
A World Diabetes Foundation Funded Project
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FOOD GUIDE PYRAMID

- Sweet (Sparingly) Fats (< 3 tsp/day)
- Dairy Products (2-3 servings/day)
- Meat and Meat Products (1-2 servings/day)
- Fruits (2 servings/day)
- Vegetables (3 servings/day)
- Cereals (6 servings/day)

Project MARG: The Path

Always Be Active
- Limit your TV viewing & other sitting activities
- Walking, Jogging, Skipping, Swimming, Cycling, Football, etc.
- Pick up any one activity daily
Debate on Health Topic
Poster Making on Health Topics

Healthy Food

“Juicing is a powerful way to good health, partly because fresh juice has powerful antioxidants but also because it is central to daily needs of phytonutrients.”

EAT FRESH FOOD
Children as Chefs
Healthy Cooking Contest
Cooking Healthy Breakfast
Poster Making on Health Topics

Left Poster:
Junk Food: Janta Alert!
Consumption of this leads to:
- Cancer
- Diabetics
- Arthritis
- Hypertension
- Death

Right Poster:
Power Puff Vegetables vs. MoJo Junk

By: Nageshwar S
Skit on Health Topic
Slogan Writing
Health Walk

Diabetes Foundation (India)

In Partnership & Sharing With
ROTARY CLUB OF DELHI SOUTH EAST & World Diabetes Foundation
Welcomes You at
Walk to Prevent Obesity, Diabetes & Heart Disease

Saturday, August 25, 2007 from Rose Garden (gate facing IIT), New Delhi

with support from
Arjuna Awardees Association & Indian Medical Association
Types of Exercise

AEROBIC

STRENGTH

FLEXIBILITY
Summary
Summary

• Increasing childhood obesity in India, associated with multiple cardiovascular risk factors is harbinger of early diabetes and heart disease.

• This epidemic of obesity and the metabolic syndrome in children is fuelled by imbalanced diets and physical inactivity.

• Our group has created a module of successful intervention in adolescents for healthy lifestyle and prevention of obesity and diabetes.

• This intervention leads to change in knowledge, practices and physiological benefits in short period of time.

• Countrywide programs, akin to our programs “M ARG” and “DISHAA” in schoolchildren are urgently needed.
Coordination and Regional Teams

- **The Central Coordinating Team (CCT)**
  - Dr. Priyali Shah  Swati Bhardwaj
  - Dr. Seema Gulati  Neha Mittal
  - Sugandha Nayar  Surya Bhatt
    Priyanka Nigam

- **City-wise Teams**
  - Delhi Team
  - Jaipur Team
    - Dr Rajeev Gupta and Team
  - Agra Team
    - Dr DK Hazra and Team
  - Allahabad Team
    - Dr Sarita Bajaj and Team
  - Mumbai Team
    - Dr Jagmeet Madan and Team
  - Dehradun Team
    - Dr Kuldeep Datta and Team
  - Lucknow team
    - Dr Ramakant and team