LIST OF ABBREVIATIONS

AACE - American Association of Clinical Endocrinologists

AHA – American heart association

AO - Abdominal Obesity

apoA-I – Apolipoprotein A - I

apoB – Apolipoprotein B

ASCVD - Atherosclerotic Cardiovascular Disease

BMI – Body mass index

BMR – Basal metabolic rate

BP – Blood pressure

BRHS - British Regional Heart Study

CAC - Coronary artery calcification

CARDIA - Coronary Artery Risk Development in Young Adults

CHD - Coronary heart disease

CHO – Carbohydrates

CI - Confidence Interval

CO - Central Obesity

CRISPS2 - Cardiovascular Risk Factor Prevalence Study-2

CRP - C-Reactive Protein

CSA - Chronic Stable Angina

CT - computed tomography
CVD – Cardiovascular Disease
DPS – Diabetes Prevention Study
DSP – Diastolic Blood Pressure
DWL – Double Labelled Water
DXA - Dual Energy X-Ray Absorptiometry
EE - Energy Expenditure
EGIR - European Group for the Study of Insulin Resistance
ENDCAD - Emirates National Diabetes study and screening for risks factors for Coronary Artery Disease
EYHS – European Youth Heart Study
FAO – Food And Agriculture Organization
FFQ – Food Frequency Questionnaire
FPG - Fasting Plasma Glucose
FPL - Familial Partial Lipodystrophy
FRS - Framingham Risk Score
GADAs - Glutamic Acid Decarboxylase Autoantibodies
GHQ - General Health Questionnaire
GXT - Graded Exercise Test
HD - Highly Distressed
HDL - High Density Lipoprotein
HDL-C - High Density Lipoprotein Cholesterol
HGI - High Glucose Level
HIV – Human Immunodeficiency Virus
HOMA - Homeostasis Model Assessment
HR - Hazard Ratio
HRQL - Health-Related Quality of Life
HRR - Heart Rate Recovery
HT - Arterial Hypertension
HTN – Hypertension
ICMR - Indian Council of Medical Research
IDF – International Diabetes Federation
IDSP – Integrated Disease Surveillance Project
IFG - Impaired Fasting Glucose
IGT – Impaired Glucose Tolerance
IHD - Ischemic Heart Disease
IHHP - Isfahan Healthy Heart Program
IIMT - Intimal-Medial Thickness of Internal
IOTF - International Obesity Task Force
IPC - Investigations Préventives et Cliniques
IRS – Insulin Resistance Syndrome
IS – Insulin Sensitivity
LADA - Latent Autoimmune Diabetes of Adults

LDL-C - Low Density Lipoprotein Cholesterol

LTPA - Leisure-Time Physical Activity

MEC - Mobile Examination Center

MESA - Multi-Ethnic Study of Atherosclerosis

MET - Metabolic Equivalent

MetS - Metabolic Syndrome

MI - Myocardial Infarction

MS – Metabolic Syndrome

MUAC - Mid Upper Arm Circumferences

MUFA – Monounsaturated Fatty Acid

NCDs - Non Communicable Diseases

NCEP/ATP III - National Cholesterol Education Program/Adult Treatment Plan III

NDIC - National Diabetes Information Clearinghouse

NEFA - Nonesterified Fatty Acids

NEQ - Night Eating Questionnaire

NES - Night Eating Syndrome

NHANES - National Health and Nutrition Examination Survey

NHLBI/AHA – American Heart Association and the National Heart Lung, and Blood Institute
NMS – Non Metabolic Syndrome

Non-HDL-C – Non High Density Lipoprotein Cholesterol

OGTT – Oral Glucose Tolerance Test

OPD – Out Patient Department

OR - Odds Ratio

PA – Physical Activity

PAI - Plasminogen Activator Inhibitor

PAL – Physical Activity Level

PAQ - Physical Activity Questionnaires

pNGT - Previous Normal Glucose Tolerance

pOGCT - Previous Oral Glucose Challenge Test

PUFA – Polyunsaturated Fatty Acid

RDA – Recommended Dietary Allowances

RR – Relative Risk

SBP – Systolic Blood Pressure

SFA – Saturated Fatty Acid

SMHS - Shanghai Men's Health Study

SPC - San Pedro de Cajas

T2DM - Type 2 Diabetes Mellitus

TFA – Trans Fatty Acid
TG – Triglycerides

TOD - TARGET ORGAN DAMAGE

UAE - United Arab Emirates

UK – United Kingdom

US – United States

VAI - Visceral Adiposity Index

VFA - Visceral Fat Area

VLDL-C - Very Low Density Lipoprotein Cholesterol

VO2 max - Maximum Volume of Oxygen

WC – Waist Circumference

WHO – World Health Organization

WHR – Waist Hip Ratio

WHS - World Health Survey

WHTR - Waist-Height Ratio
LIST OF TABLES

Table 1.1 AACE Clinical Criteria for Diagnosis of the Insulin Resistance Syndrome

Table 3.1 The International BMI Classification of underweight, overweight and obesity for adults.

Table 3.2 Classification of weight status according to BMI in Asian Adults

Table 3.3 Categories for Blood Pressure Levels in Adults (measured in millimeters of mercury, or mmHg)

Table 3.4 PAL values as per Physical Activity Questionnaire and Actical Device

Table 4.1 Distribution of MS subjects by different definitions of metabolic syndrome

Table 4.2 Baseline Information

Table 4.3 Physical Activity Profile

Table 4.4 Physical activity over the years

Table 4.5 Distribution of subjects by PAL values

Table 4.6 Physical activity levels defined by MET minutes/wk

Table 4.7 Distribution of subjects by BMI classification

Table 4.8 Distribution of MS subjects by BMI classification and PAL

Table 4.9 Distribution of subjects on the basis of number of MS diagnostic components.

Table 4.10 Distribution of MS subjects by number of MS diagnostic components and PAL
Table 4.11 Means values of MS diagnostic components by number of MS diagnostic components
Table 4.12 Distribution of subjects by meal pattern
Table 4.13 Distribution of subjects for skipping meals
Table 4.14 Distribution of subjects by likes and preferences
Table 4.15 Distribution of subjects by consumption of fruits and vegetables
Table 4.16 Distribution of subjects for consumption of fats
Table 4.17 Distribution of subjects by consumption of type of milk and other beverages
Table 4.18 Distribution of subjects for smoking and alcohol consumption
Table 4.19: Mean energy and nutrient intake of male subjects
Table 4.20: Mean energy and nutrient intake of female subjects
Table 4.21 Food frequency of consumption of snacks, sweet and processed food
Table 4.22 Diagnostic components of Metabolic Syndrome, BMI and Physical Activity – Karl Person’s Correlation
Table 4.23 Independent nutritional factors that contribute to metabolic syndrome – results of logistic regression analysis
Table 4.24 Independent factors that contribute to metabolic syndrome – results of logistic regression analysis
LIST OF FIGURES

Figure 1.1 Complex interactions of genetic, perinatal and nutritional and other acquired factors in development of insulin resistance, type 2 diabetes and coronary heart diseases in Asian population

Figure 1.2 Conceptualizes the role of physical activity and nutrition in the etiology of metabolic syndrome and CVD risk.

Figure 4.1 Distribution of metabolic syndrome subjects by gender

Figure 4.2 Distribution of metabolic syndrome subjects by age and gender

Figure 4.3 Percentage prevalence of diagnostic characteristics of metabolic syndrome in MS subjects

Figure 4.4 Percentage prevalence of diagnostic characteristics of metabolic syndrome in NMS subjects

Figure 4.5 Distribution of MS females by age categories

Figure 4.6 Distribution of MS males by age categories

Figure 4.7 Distribution of Subjects by Family History (Multiple responses)

Figure 4.8 Distribution of subjects as per global guidelines for physical activity

Figure 4.9 Distribution of subjects by PAL values

Figure 4.10 Distribution of MS and NMS subjects by MET minutes/wk

Figure 4.11 Distribution of MS subjects by fasting blood glucose and PAL

Figure 4.12 Distribution of MS subjects by triglycerides levels and PAL

Figure 4.13 Distribution of MS female subjects by waist circumference and PAL

Figure 4.14 Distribution of MS male subjects by waist circumference and PAL

Figure 4.15 Distribution of MS female subjects by HDL cholesterol and PAL
Figure 4.16 Distribution of MS male subjects by HDL cholesterol and PAL

Figure 4.17 Distribution of MS subjects by systolic blood pressure and PAL

Figure 4.18 Distribution of MS subjects by diastolic blood pressure and PAL

Figure 4.19 Distribution of subjects by BMI classification

Figure 4.20 Distribution of MS subjects by BMI classification and PAL

Figure 4.21 Distribution of subjects on the basis of number of MS diagnostic components.

Figure 4.22 Distribution of MS subjects by number of MS diagnostic components and PAL

Figure 4.23 Means values of MS diagnostic components by number of MS diagnostic components

Figure 4.24: Percent adequacy of energy and nutrient intake in male subjects

Figure 4.25: Percent adequacy of energy and nutrient intake in female subjects

Figure 4.26 Phenotypic markers of metabolic syndrome
LIST OF ANNEXURES

I. Questionnaire – General Information
II. Questionnaire – Dietary Information
III. Questionnaire – Physical Activity
IV. Questionnaire – Food Frequency
V. Moderate and Vigrous-Intensity Physical Activity By WHO (2012)
VI. METS as per specific activity
VII. Anthropometric Measurements, Diagnostic Components of MS and Physical Activity Level of Metabolic Syndrome Subjects
VIII. Anthropometric Measurements, Diagnostic Components of MS and Physical Activity Level of Non Metabolic Syndrome Subjects
IX. Energy and Nutrient Intake of Metabolic Syndrome Subjects
X. Energy and Nutrient Intake of Non Metabolic Syndrome Subjects
XI. Information Sheet
XII. Consent Form
XIII. List of Paper Publications and Presentation
XIV. Paper Publications

1. Obesity, Metabolic Syndrome and Physical Activity in Indian Adults.
2. Metabolic Syndrome among Urban Indian Adults.