



**Second Asia-Oceania
Conference
on Obesity**
(MASO 2003)

*Under the auspices of
Asia-Oceania Association for the Study of Obesity
(AOASO)*

***Combating the Obesity Epidemic:
a shared responsibility***

Souvenir Programme & Abstracts

**7 - 9 September 2003
Renaissance Hotel
KUALA LUMPUR**



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a shared responsibility**

SOUVENIR PROGRAMME & ABSTRACTS

**7 – 9 September 2003
Renaissance Hotel, Kuala Lumpur
MALAYSIA**

2nd AOCO SECRETARIAT

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TABLE OF CONTENTS

Message from Minister of Health Malaysia	iii
Message from President, Asia-Oceania Association for the Study of Obesity	iv
Message from Organising Chairman, 2 nd Asia-Oceania Conference on Obesity	v
Organising Committee	vi
International Scientific Advisory Board	vii
Conference Information	viii
Venue Layout	x
Acknowledgement	xii
Scientific Programme at a glance	xiii
Official Opening	xiv
Scientific Programme	xv
Abstracts for Keynote Address and Plenary Lectures	1
Abstracts for Symposium Sessions	6
List of Posters	62
Abstracts for Poster Session	66



MENTERI KESIHATAN MALAYSIA
(Minister of Health Malaysia)

MESSAGE

I wish to extend a warm welcome to the participants of the 2nd Asia-Oceania Conference on Obesity. I would also like to thank the Malaysian Association for the Study of Obesity (MASO) and the Asia-Oceania Association for the Study of Obesity (AOASO) for inviting me to write this message.

On behalf of the Ministry of Health Malaysia, I wish to congratulate the Organizing Committee for their fine effort in convening this scientific conference which has attracted no less than 50 foreign speakers, some of whom are world renowned in the field of obesity, to Kuala Lumpur. A conference such as this will undoubtedly provide a platform for both speakers and participants to share experiences and update their knowledge on obesity.

The theme "Combating the obesity epidemic: a shared responsibility" is timely and serve as a reminder to us all. Despite considerable advances in our knowledge of the etiology of obesity and its management, the diseases associated with being obese are far too great a burden for researchers, health experts and policy makers to ignore and the challenges that lies ahead have never been greater.

It is my sincere hope that this conference will highlight and discuss some of the current thoughts and concerns on obesity, how it should be treated and managed, and more importantly how our Government will cope with this ever escalating epidemic.

May I wish all the participants a fruitful meeting and an enjoyable stay in Malaysia.


DATO' CHUA JUI MENG
Minister of Health Malaysia



PRESIDENT AOASO

Asia-Oceania Association for the Study of Obesity

MESSAGE

It is good to be able to welcome you here to Kuala Lumpur for the Second AOASO conference and it is good of the Malaysian Association to host it for us. We are a new and relatively small regional association, and it is important for us to meet and establish our identity and to share information. This is the most populous region of the world and the one in which obesity and metabolic disease will make the greatest impact. It is important to study and discuss the problem and this conference gives us the opportunity to do so. It also allows us to highlight the problem, and potential solutions for our respective health departments and governments, as well as making the medical community aware that things can be done to treat obesity.

It is important too, for us to develop our expertise in the region, and this meeting is only one of the things we can and should be doing. We need to have a newsletter, produce education materials, run education programs and be involved in trials and public health programs. There is a great deal to do, let us get started!

WELCOME!

Prof Dr Ian Caterson

President

Asia-Oceania Association for the Study of Obesity



PRESIDENT MASO

Malaysian Association for the Study of Obesity

MESSAGE

It gives me great pleasure to welcome you to Kuala Lumpur for the 2nd Asia-Oceania Conference on Obesity (AOCO). We are indeed honoured to have Y.B. Dato' Chua Jui Meng, Minister of Health Malaysia to grace the official opening of the conference.

It is most gratifying to note that despite the SARS scare and the war in Iraq, many scholars and eminent scientists in the field of obesity from no less than 25 countries have brave the journey to join us in what promises to be a memorable event in the obesity calendar for the region.

MASO have done our best to honour the confidence entrusted upon us by the AOASO Council 2 years ago in Japan, to come out with a broad-based scientific programme consistent with the growing concern of an obesity epidemic in the region. We have a busy 2-day programme which include a Keynote address, 3 Plenary lectures, 56 Symposia papers and more than 40 Poster presentations that will allow participants to update themselves of the current state of the art and science of obesity.

MASO would like to express our sincere gratitude to AOASO council and Advisory Board for their support and to all the speakers for accepting our invitation. We would also like to acknowledge the support of the sponsors and contributors, and last but not least, the participants for making this conference a success.

May you all have a fruitful meeting and to our foreign colleagues we wish you an enjoyable stay in Malaysia. Once again "**Selamat Datang**" – Welcome to Kuala Lumpur.


Prof Dr Mohd Ismail Noor

ORGANISING COMMITTEE

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Prof Philip James	International Obesity Task Force, United Kingdom
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Dr Ranjan Yajnik	King Edward Memorial Hospital Diabetes Centre, India
Dr L Tommaso Cavalli-Sforza	World Health Organization, WPRO, Philippines
Dr Prakash Shetty	Food Agriculture Organization, Italy
Dr Mabel Yap-Deurenberg	Health Promotion Board, Singapore

CONFERENCE INFORMATION

REGISTRATION DESK

The registration desk will be located at the entrance to Ballroom A, Renaissance Hotel, Kuala Lumpur. Registration will be open during the following hours:

Sunday, 7 September 2003	1400 – 1630 hours
Monday, 8 September 2003	0800 – 0900 hours, 1000 – 1600 hours
Tuesday, 9 September 2003	0800 – 1000 hours

All delegates may collect their conference materials at the registration desk during these hours. Participants and accompanying persons are required to wear their badges throughout the conference for identification purposes and for admission to various functions.

SECRETARIAT ROOM

The Secretariat Room is located at the Conference Office (next to Ballroom A). You may preview your slides at the Secretariat Room from 0900 – 1700 hours.

POSTER SESSION

Poster sessions will be held from 0900 – 1700 at Function Rooms 3 & 4. Posters should be put up between 0800 – 0900 on Monday, 8 September 2003, and should be taken down by 1700 hours on Tuesday, 9 September 2003.

CONFERENCE RECEPTION

All registered conference participants and their registered accompanying persons are invited to the cocktail reception. It will be held at Mezzo Lounge, 1st Floor, Renaissance Hotel, Kuala Lumpur between 1830 – 2030 hours on Sunday, 7 September 2003.

OPENING CEREMONY

The conference will be officially opened on Monday, 8 September 2003 at 0900 hours, at Ballroom A, Renaissance Hotel, Kuala Lumpur.

CONFERENCE DINNER

Conference participants and their registered accompanying persons who have paid for the nominal fee may attend the conference dinner. It will be held at Ballroom B, Renaissance Hotel, Kuala Lumpur on Monday, 8 September 2003 at 2000 hours.

ROCHE SATELLITE SYMPOSIUM

A satellite symposium organised by Roche (M) Sdn Bhd will be held at Ballroom A, Renaissance Hotel, Kuala Lumpur between 1845 – 1930 hours on Monday, 8 September 2003. Prof Philip James will speak on "The medical challenge of Asian diabetes".

ILSI POST-CONFERENCE WORKSHOP

A post-conference workshop entitled "School-based intervention programmes for healthy weight management" will be held on Wednesday, 10 September 2003 at Renaissance Hotel, Kuala Lumpur. This workshop is organised by ILSI SouthEast Asia.

AOASO COUNCIL MEETING

AOASO Council Members will attend the meeting on Monday, 8 September 2003 at 1600 hours. The venue is at Function Rooms 9 & 10, Renaissance Hotel, Kuala Lumpur.

MASO ANNUAL GENERAL MEETING

MASO Members are invited to attend the AGM on Tuesday, 9 September 2003, 1830 hours at Function Rooms 5 & 6. All members who attend the meeting will be invited to a dinner when the meeting ends.

TRADE EXHIBITION

A trade exhibition is held in conjunction with the 2nd Asia-Oceania Conference on Obesity. The exhibition will be located at the Concourse Area, Ground Floor, Renaissance Hotel, Kuala Lumpur. Exhibition opening hours are as follows:

Monday, 8 September 2003	0900 – 1700 hours
Tuesday, 9 September 2003	0900 – 1600 hours

TRADE EXHIBITORS

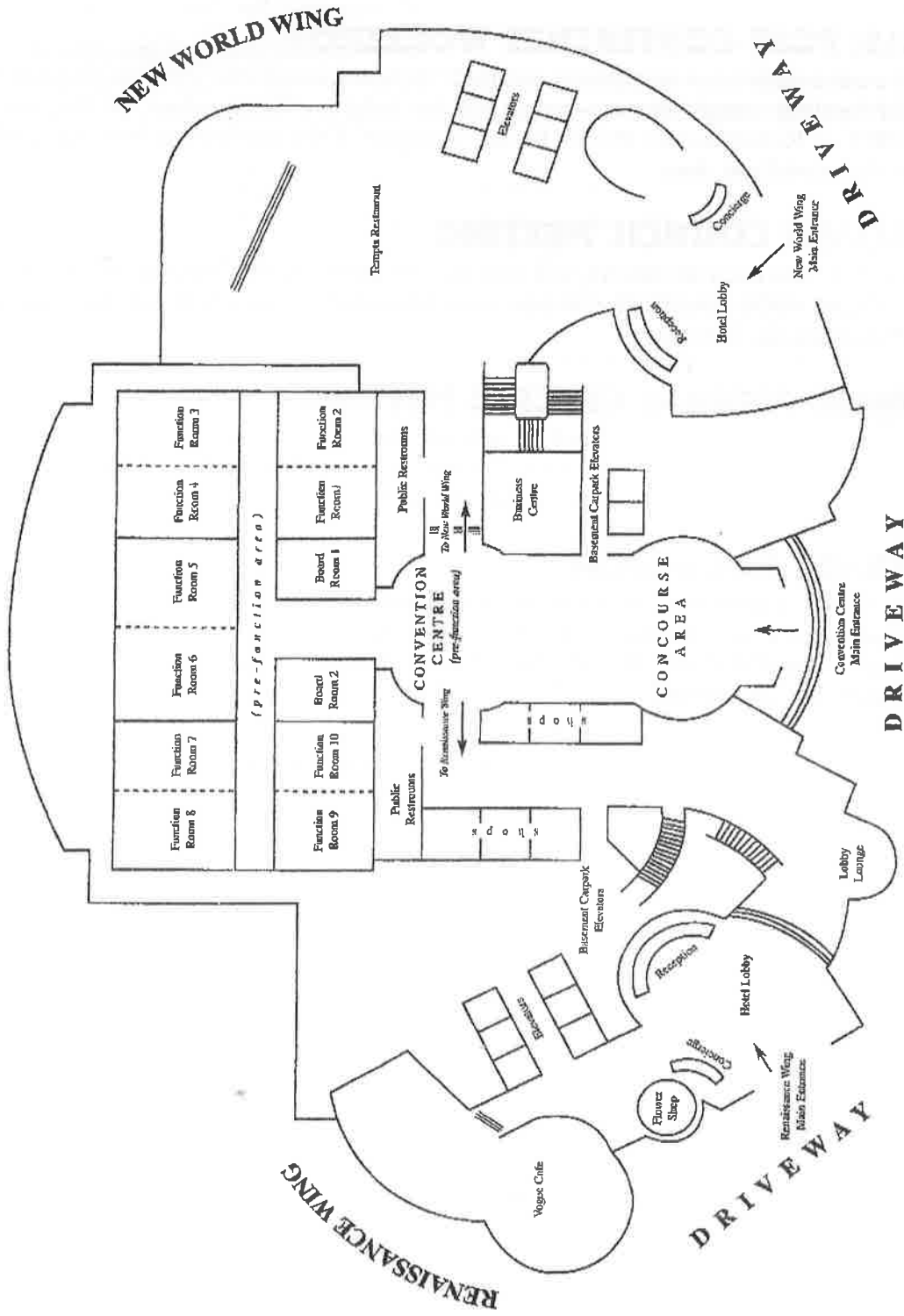
Companies participating in the trade exhibition include:

Exhibitor

Roche (M) Sdn Bhd
Totalife (M) Sdn Bhd
Pacific Home Appliance Sdn Bhd
Nestle Products Sdn Bhd
Biospace Smitech Medical Sdn Bhd
The Merisant Company
Graf Medical Systems Sdn Bhd
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Malaysian Palm Oil Promotion Council

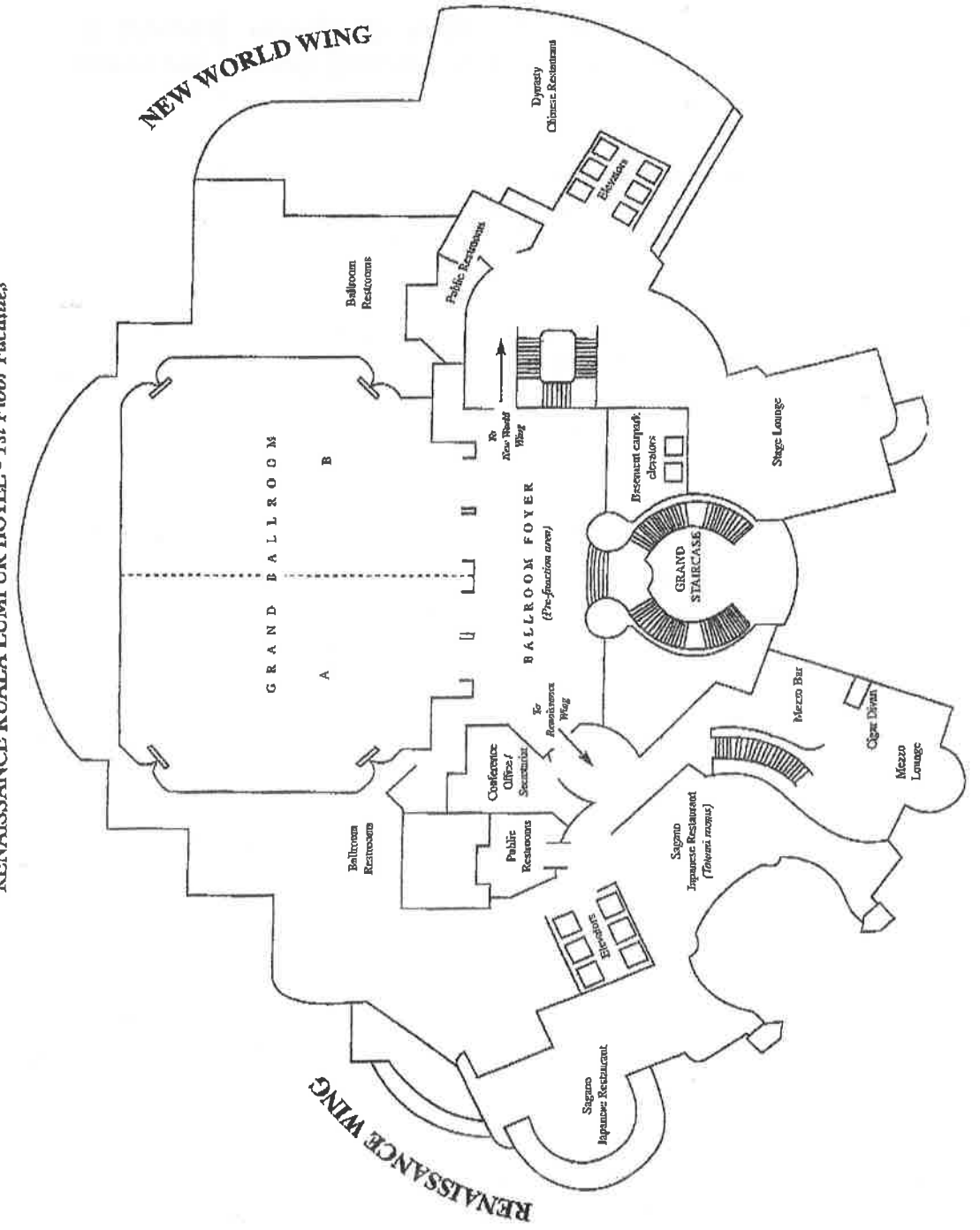
VENUE LAYOUT: GROUND FLOOR

RENAISSANCE KUALA LUMPUR HOTEL - Ground Floor Facilities



VENUE LAYOUT: FIRST FLOOR

RENAISSANCE KUALA LUMPUR HOTEL - 1st Floor Facilities



ACKNOWLEDGEMENT

The Malaysian Association for the Study of Obesity (MASO) gratefully acknowledges the generous support of the following sponsors and contributors:

Gold Sponsors

Abbott Laboratories (M) Sdn Bhd
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Malaysian Palm Oil Promotion Council
Servier (M) Sdn Bhd
Universiti Kebangsaan Malaysia

* Secretarial assistance is much appreciated.

SCIENTIFIC PROGRAMME AT A GLANCE

Time (hrs)	Sunday 7 September	Monday 8 September	Tuesday 9 September
0800 – 0900		REGISTRATION (Foyer of Ballroom A)	Plenary 2: The endocrine & signalling role of adipose tissue in obesity (Ballroom A)
0900 – 1000		OPENING CEREMONY (Ballroom A)	Plenary 3: Role of maladaptive thermogenesis in predisposition to obesity & chronic metabolic diseases (Ballroom A)
1000 – 1030		COFFEE BREAK (Foyer of Ballroom A) Poster viewing / Exhibition	
1030 – 1240		Keynote address: The challenge of Asian obesity – a double handicap (Ballroom A) Plenary 1: The costs of obesity (Ballroom A)	Symposium 5: Energy balance & appetite regulation (Ballroom A) Symposium 6: Active lifestyle programmes for weight management: evaluating impact and sustainability (sponsored by ILSI) (Function Rooms 5 & 6)
1240 – 1300		Poster viewing / Exhibition	
1300 – 1400		LUNCH (Tempts Restaurant, Ground Floor)	
1400 – 1610	REGISTRATION (Foyer of Ballroom A)	Symposium 1: Genetics of obesity and body composition (Ballroom A) Symposium 2: Prevalence and risk factors of obesity (Function Rooms 5 & 6)	Symposium 7: Pharmacological / surgical treatment (Ballroom A) Symposium 8: Diet and behavioural interventions (Function Rooms 5 & 6)
1610 – 1630		TEA BREAK (Foyer of Ballroom A) Poster viewing / Exhibition	
1630 – 1820		Symposium 3: Childhood obesity (Ballroom A) Symposium 4: Obesity and its metabolic consequences (Function Rooms 5 & 6)	Symposium 9: Prevalence of obesity (Ballroom A) Symposium 10: Obesity and related issues (Function Rooms 5 & 6)
1845 – 1930	WELCOME RECEPTION (MEZZO Lounge)	ROCHE SATELLITE SYMPOSIUM (Ballroom A)	CLOSING CEREMONY (Ballroom A) 1800 – 1830
2000 – 2200	1830-2030	CONFERENCE DINNER (Ballroom B)	MASO AGM (Function Rooms 5 & 6) 1830 – 2000

Note: Venue of events/sessions given in brackets

OFFICIAL OPENING

Date: Monday, 8 September 2003

Venue: Ballroom A, Renaissance Hotel, Kuala Lumpur

8.00 – 9.00 am REGISTRATION

8.45 am Arrival of guests

8.50 am Arrival of VIPs

8.55 am Arrival of Minister of Health Malaysia,
Y.B. Dato' Chua Jui Meng

9.00 am **Welcome Address**
by Y.Bhg. Prof Dr Mohd Ismail Noor
President of MASO &
Organizing Chairman, 2nd AOCO

**9.10 am Address & Official Opening
by Y.B. Dato' Chua Jui Meng
Minister of Health Malaysia**

9.40 am Tour of exhibition booths

10.00 – 10.15 am Refreshments

SCIENTIFIC PROGRAMME

Day 1

Monday 8 September 2003

KEYNOTE ADDRESS

Chairperson : Ismail Merican (Malaysia)

Venue : Ballroom A

10.15 - 11.15 am **The challenge of Asian obesity – a double handicap**
Philip James (United Kingdom)

PLENARY LECTURE 1

Chairperson : Narimah Awin (Malaysia)

Venue : Ballroom A

11.15 - 12.00 pm **The costs of obesity**
Ian Caterson (Australia)

12.00 - 1.00 pm **Poster Viewing / Exhibition**

1.00 – 2.00 pm **LUNCH**

SYMPOSIUM 1: GENETICS OF OBESITY AND BODY COMPOSITION
 Chairpersons : Paul Trayhurn (United Kingdom), Wan Muhamad (Malaysia)

Venue: Ballroom A

- 2.00 – 2.30 pm S1-1
The role of genetic and environmental factors in weight change
Hainer V (Czechoslovakia)
- 2.30 – 2.50 pm S1-2
Recent advances in genetics of severe obesity
Lee Yung Seng (Singapore)
- 2.50 – 3.10 pm S1-3
High body fatness at relatively low body mass index in Singapore children & adolescents
Paul Deurenberg (Singapore)
- 3.10 – 3.30 pm S1-4
Differences in fat distribution among European, Moari, Pacific island and Indian people in New Zealand
Elaine Rush (New Zealand)
- 3.30 – 3.50 pm S1-5
Leptin profile, body composition and metabolic features of Omani obese subjects
Masoud Y (Oman)
- 3.50 – 4.30 pm **Tea Break/ Posters/ Exhibition**

SYMPOSIUM 2 : PREVALENCE AND RISK FACTORS OF OBESITY
 Chairpersons : Mabel Deurenberg-Yap (Singapore), Lum SK (Malaysia)

Venue: Function rooms 5 & 6

- 2.00 – 2.30 pm S2-1
Markers of adiposity & health outcomes in Asian populations
Tim Gill (Australia)
- 2.30 – 2.50 pm S2-2
Evidence based classification & criteria of obesity in Japan
Shuji Inoue (Japan)
- 2.50 – 3.10 pm S2-3
Trends and disease risks of obesity in Chinese populations
Wu Zhaosu (China)
- 3.10 – 3.30 pm S2-4
Factors determining obesity in the Arab countries
A Musaiger (Bahrain)
- 3.30 – 3.50 pm S2-5
Prevalence of obesity in under five years children: Isfahan Province, Iran 2002
Heidarzadeh A (Iran)
- 3.50 - 4.10 pm S2-6
Prevalence & risk factors of obesity among young adolescents in Taiwan
Nain-Feng Chu (Taiwan)
- 4.10 – 4.30 pm **Tea Break/ Posters/ Exhibition**

SYMPOSIUM 3: CHILDHOOD OBESITY

Chairpersons : Kate Steinbeck (Australia), Tee E Siong (Malaysia)

Venue: Ballroom A

- 4.30 – 5.00 pm S3-1
Treating childhood obesity : options and outcomes
Kate Steinbeck (Australia)
- 5.00 – 5.20 pm S3-2
The role of exercise in combating childhood obesity
Richard Winsley (UK)
- 5.20 – 5.40 pm S3-3
New BMI-for-age growth charts for Singapore children: need for locally relevant charts for obesity diagnosis
Mabel Deurenberg-Yap (Singapore)
- 5.40 – 6.00 pm S3-4
An obesity epidemic associated with unhealthy lifestyles among 10 and 11-year olds in four Asian cities
Guldan G (Hong Kong)
- 6.00 – 6.20 pm S3-5
A study of overweight and obesity among school children in Manila
Florentino RF (Philippines)

SYMPOSIUM 4: OBESITY AND ITS METABOLIC CONSEQUENCES

Chairpersons : Mustaffa Embong (Malaysia), Hainer V (Czechoslovakia)

Venue : Function rooms 5 & 6

- 4.30 – 5.00 pm S4-1
Hormones & obesity – what is relevant?
Khalid Kadir (Malaysia)
- 5.00 - 5.20 pm S4-2
Epidemiology on obesity and cardiovascular risk factors in South Korea
Hye Soon Park (Korea)
- 5.20 - 5.40 pm S4-3
Prevalence of metabolic syndrome among Filipino adults aged 20 years and over
Tanchoco CC (Philippines)
- 5.40 - 6.00 pm S4-4
Childhood obesity and metabolic syndrome
Fatimah A (Malaysia)
- 6.00 - 6.20 pm S4-5
Standard of living index, body fat and insulin resistance in middle-aged Indian men in villages, slums and urban middle class
Kulkarni SR (India)

Day 1 Monday 8 September 2003

ROCHE SATELLITE SYMPOSIUM
Chairperson : Ikram Shah (Malaysia)

Venue: Ballroom A

6.45 - 7.30 pm **The medical challenge of Asian diabetes**
Philip James (United Kingdom)

8.00 - 10.00 pm CONFERENCE DINNER
Venue: Ballroom B

Day 2 Tuesday 9 September 2003

PLENARY LECTURE 2
Chairperson : Khalid Kadir (Malaysia)

Venue : Ballroom A

8.30 - 9.15 am **The endocrine & signalling role of adipose tissue in obesity**
Paul Trayhurn (UK)

PLENARY LECTURE 3
Chairperson : Mohd Ismail Noor (Malaysia)

Venue : Ballroom A

9.15 - 10.00 am **Role of maladaptive thermo genesis in predisposition to obesity & chronic metabolic diseases**
Abdul Dulloo (Switzerland)

10.00 - 10.30 am **Coffee Break/ Exhibition/ Posters**

SYMPOSIUM 5: ENERGY BALANCE & APPETITE REGULATION
 Chairpersons : Abdul Dulloo (Switzerland), Winnie Chee (Malaysia)

Venue : Ballroom A

10.30 - 11.00 am	S5-2 Determinants of activity energy expenditure <i>Westerterp K (Netherlands)</i>
11.00 - 11.20 am	S5-3 Metabolic predisposition to obesity in Malaysians with particular reference to energy expenditure <i>Ismail MN (Malaysia)</i>
11.20 - 11.40 am	S5-4 Glycemic index and satiety in obese Mexican with type 2 diabetes <i>Montserrat BG (Mexico)</i>
11.40 - 12.00 pm	S5-5 Energy homeostasis and BAT <i>Choi WH (South Korea)</i>
12.00 - 12.20 pm	S5-6 The role of dietary carbohydrate in the development of obesity <i>Nik Mazlan Mamat (Malaysia)</i>
12.20 - 1.00 pm	Posters/ Exhibition
1.00 - 2.00 pm	LUNCH

SYMPOSIUM 6: ACTIVE LIFESTYLE PROGRAMMES FOR WEIGHT MANAGEMENT - EVALUATING IMPACT & SUSTAINABILITY
 (Symposium sponsored by ILSI SouthEast Asia)
 Chairpersons : Jegathesan M (Malaysia), Richard Winsley (UK)

Venue: Function rooms 5 & 6

10.30 - 11.00 am	S6-1 Physical activity & exercise - the enabling instruments <i>Jegathesan M (Malaysia)</i>
11.00 - 11.30 am	S6-2 Physical Activity & Nutrition Programs in the USA: Unique Characteristics and Components of School Interventions <i>Debra Kibbe (USA)</i>
11.30 - 12.00 am	S6-3 Physical activity intervention programs - impact & sustainability <i>Andrew Hills (Australia)</i>
12.00 - 12.30 pm	S6-4 Promoting physical activity at a national level - the Singapore experience <i>Teh Kong Chuan (Singapore)</i>
12.30 - 1.00 pm	Q & A
1.00 - 2.00 pm	LUNCH

SYMPOSIUM 7: PHARMACOLOGICAL / SURGICAL TREATMENT
Chairpersons : Litonjua A (Philippines), Nor Azmi Kamaruddin (Malaysia),

Venue : Ballroom A

- 2.00 - 2.30 pm S7-1
The impact of Orlistat-induced weight reduction on metabolic profiles, insulin sensitivity and pancreatic beta cell function in obese Chinese subjects with or without type 2 diabetes mellitus
Peter Tong (Hong Kong)
- 2.30 - 2.50 pm S7-2
Psycho-behavioral and nutritional predictors of weight change in obese patients treated with sibutramine
Hainer V (Czechoslovakia)
- 2.50 - 3.10 pm S7-3
Sibutramine in obesity management - why and when?
Ian Caterson (Australia)
- 3.10 - 3.30 pm S7-4
Laparoscopic adjustable gastric banding for morbid obesity - results with 7.5 ml pouch and video presentation
Ganesh R (Singapore)
- 3.30 - 3.50 pm S7-5
Effect of novel herbal formulation containing plant extracts, amino acids and minerals in insulin resistant diabetic db/db and ob/ob mice
Abhijeet Nag (USA)
- 3.50 - 4.10 pm S7-6
Effects of obesity surgery on the metabolic syndrome
Lee WJ (Taiwan)
- 4.10 - 4.30 pm **Tea Break**

SYMPOSIUM 8: DIET & BEHAVIORAL INTERVENTIONS
Chairpersons : Ian Caterson (Australia), Shuji Inoue (Japan)

Venue : Function rooms 5 & 6

- 2.00 - 2.30 pm S8-1
Developing new dietary approaches to weight management
James Stubb (UK)
- 2.30 - 2.50 pm S8-2
High protein intake supports weight maintenance after body weight loss in humans
Westerterp-Plantenga M (Netherlands)
- 2.50 - 3.10 pm S8-3
Primary care management of obesity in Australia lower middle class patients
Gonczy J (Australia)
- 3.10 - 3.30 pm S8-4
Weight maintenance in post-weight reduction program: assessing its impact on quality of life
Wan A Manan (Malaysia)
- 3.30 - 3.50 pm S8-5
Effects of training programs on the management of obesity in an Iranian population
Arain Nezhad-Javad (Iran)
- 3.50 - 4.10 pm S8-6
Good glycaemic control through diet and structured exercise in obese type 2 diabetic patients in Kelantan
Aziz al-Safi Ismail (Malaysia)
- 4.10 - 4.30 pm **Tea Break**

SYMPOSIUM 9: PREVALENCE OF OBESITY
Chairpersons : Tim Gill (Australia), Rachmad S (Indonesia)

Venue : Ballroom A

- 4.30 - 4.45 pm S9-1
The co-existence of hunger and obesity among native migrant children in Mexico
Jimenez-Cruz A (Mexico)
- 4.45 - 5.00 pm S9-2
Obesity in Saudi Arabia
Madani KA (Saudi Arabia)
- 5.00 - 5.15 pm S9-3
Body mass index, waist circumference and health status of rural elderly Malays in four rural areas of Malaysia
Suzana S (Malaysia)
- 5.15 - 5.30 pm S9-4
Overweight & obesity among Malaysian adolescents
Poh Bee Koon (Malaysia)
- 5.30 - 5.45 pm S9-5
Height weight difference index for screening overweight & obesity in adults
Pruenglampoo S (Thailand)
- 5.45 - 6.00 pm S9-6
Overweight and obesity among pre-school aged Filipino children
Caridad Santos (Philippines)

SYMPOSIUM 10: OBESITY & RELATED ISSUES
Chairpersons : Kim YS (Korea), Khoo Kah Lin (Malaysia)

Venue : Function rooms 5 & 6

- 4.30 - 4.45 pm S10-1
The medical cost of obesity in Taiwan area
Chung Yang Yen (Taiwan)
- 4.45 - 5.00 pm S10-2
The effect of physical education on fat distribution and aerobic endurance in female Filipino adolescents
Willy Pieter (Malaysia)
- 5.00 - 5.15 pm S10-3
Body image perception: are overweight and obese rural adolescents different from their urban counterparts?
Norimah A Karim (Malaysia)
- 5.15 - 5.30 pm S10-4
Obesity among Iranian women- role of social factors
Mohsen M (Iran)
- 5.30 - 5.45 pm S10-5
BMI and physical activity are associated with serum uric acid levels in young adults
Kandiah M (Malaysia)
- 5.45 - 6.00 pm S10-6
Fast food as a risk factor for obesity in Indonesian school children
Hadi H (Indonesia)

6.00 - 6.30 pm **CLOSING CEREMONY**

Venue: Ballroom A

**ABSTRACTS FOR
KEYNOTE ADDRESS AND
PLENARY LECTURES**

Keynote address

The challenge of Asian obesity: a double handicap

James WPT

International Obesity Task Force, 231 N. Gower St, London NW12NS

Asians may be more susceptible to weight gain than some other groups e.g. Europeans and are more susceptible to its health impacts. These ethnic differences are traditionally considered to be genetically-based but evidence of environmental epigenetic effects are emerging with nutritional deficiencies in utero and infancy being important. LBW is linked to early stunting, these now being seen as predisposing to abdominal obesity and the metabolic syndrome in later life when modest weight gain occurs. Babies at both ends of the spectrum of birth weights seem particularly vulnerable to long term susceptibilities to adult disease. Short mothers are prone to gestational diabetes and early subsequent type 2 diabetes themselves and produce heavier babies who are then prone to childhood obesity and adolescent type 2 diabetes, i.e. an inter-generational amplifying cycle.

The fetal phase of development is the most vulnerable with organogenesis, structural development and the induction of particular proteosomes, all potentially affected by nutrient supply or the prevailing endocrine microenvironment. Despite compensatory maternal mechanisms long-term programming effects of the maternal diet occur e.g. on neural tube defects, possibly fetal and subsequent fat/lean ratios, altered brain development and hypothalamic-pituitary-adrenal axis, a reduced pancreatic capacity for insulin production and altered hepatic architecture and enzyme arrays responsible for the control of glucose metabolism.

The Asian metabolic syndrome probably signifies the double handicap of early undernutrition with subsequent excess weight gain. This means that girls and young women in particular need early interventions to minimise risk with public health initiatives in both management and prevention. The Asia - Oceania challenge is how to integrate investigative efforts but still move to persuade policy makers to combat the dramatic health burden now unfolding.

PL-1

The costs of obesity

Ian D Caterson

Human Nutrition Unit G08, University of Sydney, NSW 2006 Australia

As is now recognised, obesity is highly prevalent throughout the world, and with this comes increasing morbidity and mortality and increased health costs. Generally the costs of obesity to the community are considered in 2 main areas.

The first, and the easiest to calculate provided the correct health data for the country or region are available, are the "Direct Costs", the costs of medical and health services to the community. The second type is the "Indirect Costs", which are costs to the individual (in terms of quality of life, self-esteem, employment and own funds spent on the management of obesity) and to the society in which they live. These latter costs are calculated from loss of productivity, sick days, disability pensions etc. Given the range of health care systems and costs, obviously a wide range of direct and indirect costs has been calculated. These costs range from \$99 billion in the US (some 6-7% of health costs), to Canada reporting a range of the range C\$830 million to C\$3.4 billion, and New Zealand reporting NZ\$135 million (2% of health care costs). There are obvious difficulties in comparing these.

There are other aspects of costs to consider and perhaps these may give a better understanding of the costs of obesity. These other approaches include "Intangible Costs" a range of calculations, which include the cost of feeling unwell due to obesity. Other costs include the costs of treating an obese individual per year calculated from medical visits, hospitalisations and cost of drugs. "Disability Adjusted Life Years" is yet another measure and recently, using this approach, it appears that obesity and lack of physical activity are major risks or "costs". Other approaches include Cost Utility Analysis and cost effectiveness, these latter have been used with effect by the National Institute for Clinical Effectiveness (NICE).

To obtain valid comparisons between countries and societies, we must establish specific criteria and collect the appropriate health cost and disease prevalence data for a standard approach.

PL-2

The endocrine and signalling role of adipose tissue in obesity

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Although the rapid and continuing rise in obesity is clearly a consequence of changes in lifestyle, it has provided impetus to the investigation of the fundamental mechanisms involved in the regulation of energy balance. In the genomic era, this has included a search for those genes, or gene polymorphisms, which predispose to obesity. At a mechanistic level, important developments have occurred recently in the identification of novel neuropeptides involved in the control of appetite, such as the orexins, while the discovery of new uncoupling proteins (UCP2, UCP3, UCP4) was initially thought to provide a locus for adaptive thermogenesis in skeletal muscle and other organs outwith brown fat. A radical change in perspective on energy balance has come from new understanding of the function of white adipose tissue (WAT). The view that WAT is simply a lipid storage depot has been replaced by the recognition that it is an endocrine organ, communicating both with the brain and peripheral tissues through the release of leptin and other hormones. Leptin is secreted principally from adipocytes and acts as a critical signal in energy balance and other physiological processes. This hormone is one of a rapidly growing list of protein signals and factors released by WAT. These adipokines include the hormones adiponectin and resistin (implicated in insulin resistance), classical cytokines such as IL-6 and TNF α , as well as proteins involved in vascular haemostasis (e.g. plasminogen activator inhibitor-1), lipid metabolism (e.g. retinol binding protein), the complement system (e.g. adipsin) and the acute phase response (e.g. haptoglobin). The adipokines provide an extensive communication network between adipose tissue and other organs and some, such as plasminogen activator inhibitor-1, are directly implicated in the pathologies associated with obesity.

PL-3

Role of maladaptive thermogenesis in predisposition to obesity and chronic metabolic diseases

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An impressive body of epidemiological evidence suggest that large fluctuations in body weight are strong risks for obesity, diabetes and cardiovascular disease. These have been shown:

- (i) in adults who as neonates showed poor (fetal and early postnatal) growth followed by *catch-up growth*,
- (ii) in adults who during childhood either suffered from growth retardation followed by catch-up growth or who showed the phenomenon of *early 'adiposity rebound'*, and
- (iii) in men and women who in their young adulthood experienced weight fluctuations involving *the recovery of body weight* after substantial 'unintentional' weight loss due to disease and famine, or due to 'voluntary' slimming.

In this lecture, the case is first put forward that a *common denominator* in all these situations of large weight fluctuations is that body fat is subsequently recovered at a disproportionately faster rate than that of lean tissue, thereby underscoring a pivotal link between processes that lead to accelerated fat recovery (or *catch-up fat*) and high risks for chronic metabolic diseases. Evidence is then presented which suggest that adaptive alterations in metabolic efficiency (*i.e.* in adaptive thermogenesis) that participate in the regulation of *catch-up fat* – and which had major survival value in a lifestyle of famine-and-feast - has now turned 'maladaptive' in a lifestyle characterized by an abundance of energy-dense foods and low physical activity.

ABSTRACTS FOR SYMPOSIUM SESSIONS

The role of genetic and environmental factors in weight change

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Genetic determinants of weight change are represented by obesigenic and leptogenic genes whereas a high energy, high fat diet and a sedentary lifestyle represent the most important environmental influences. However, both eating behavior and physical activity level are also significantly influenced by genetic factors. Sedentarism might affect an increase in obesity prevalence observed recently in many European countries including the Czech Republic in spite of some decline in energy intake and fat consumption.

Outcome of the weight reduction regimen is influenced by interaction between genetic determinants and environmental lifestyle factors. Our studies demonstrated that a low consumption of both fat and protein, low fasting non-protein respiratory quotient (RQ), high restraint score of the Eating Inventory (EI) and low Beck depression score before the initiation of obesity management predicted successful outcome of the weight reduction regimen at 2-yr follow-up. In contrast to conventional treatment high restraint score of the EI at baseline was associated with a lower weight loss in response to antiobesity drugs and bariatric surgery. Sibutramine-induced weight loss maintenance at 1-yr follow-up was significantly related to decrease in disinhibition score of the EI. A low ratio of fat to carbohydrate oxidation, i.e. a high RQ was associated with a susceptibility to weight regain and weight cycling. Our study conducted in severely obese subjects confirmed the role of hereditary factors in the ability to oxidize fat. A high RQ was revealed in subjects reporting parental obesity while a low RQ was observed in those without family history of obesity. The Prague Twin Study with a very low calorie diet (VLCD) revealed large differences in weight loss in response to VLCD treatment between pairs of obese female monozygotic twins whereas a high within-pair resemblance was found for both weight loss and fat mass loss.

The extending knowledge of multiple genes involved in regulation of food intake and eating behavior, energy expenditure and fat storage is contributing to a molecular understanding of body weight regulation.

Recent advances in the genetics of severe obesity

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Common obesity is considered a multifactorial disease of polygenic inheritance, evolving from interactions of the environment, behaviour, and genes. While environmental and behavioural factors are contributory, there is increasing evidence for a genetic cause for severe obesity. Studies indicate that up to 80% of variance in the body mass index is attributable to genetic factors. Recent genetic studies have challenged our traditional views of the pathogenesis of obesity, and changed how we view obesity as just a psychological disorder arising from sheer gluttony and poor discipline.

Obesity is determined by multiple genes, which influence food intake and metabolic rate. Changes in one and more of these loci can result in dysfunctional weight regulation. The approaches used to identify these obesity related genes include genome-wide linkage studies in unrelated obese individuals, linkage studies in families, and association studies between obesity and polymorphic variants in candidate genes predicted to affect weight regulation. Unfortunately these approaches have not been as promising, because the obese phenotype is very heterogeneous, even within the same family, with variable contributions from the genetic, environmental and behavioural influences.

Significant milestones were achieved in our understanding of weight dysregulation with the recent reports of severe human obesity associated with novel genetic mutations. Seven monogenic forms of pathological human obesity have been described to date, mainly involving genes which encode proteins of the leptin axis and the melanocortin pathway, including, leptin and its receptor, pro-opiomelanocortin (POMC), proconvertase 1, peroxisome-proliferator-activated receptor γ 2 (PPAR γ 2), melanocortin-4 receptor (MC4-R) and melanocortin-3 receptor (MC3-R). Except for MC4-R, MC3-R, and PPAR γ 2, mutations in these genes cause rare, recessive, syndromic forms of obesity, associated with multiple endocrine abnormalities.

The new knowledge not only contributes to our understanding of the molecular circuitry controlling appetite and energy balance, but also opens up new therapeutic possibilities and facilitates the design of novel therapeutic agents for obesity.

High body fatness at relatively low body mass index in Singapore children and adolescents

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Body weight, body height and skinfold thickness at four sites (biceps, triceps, subscapular and suprailiac) were measured in 477 school children, aged 12 to 18 years old. Body mass index (BMI) was calculated as weight/height². Body fat percent was predicted using published formulas based on skinfolds and body mass index. In addition body fat percent was measured using deuterium oxide dilution.

In females (Caucasian) prediction formulas based on skinfolds seriously underestimated body fat percent. Also (Caucasian) prediction formulas based on BMI underestimated BF% in females. In contrast in males the prediction formulas resulted in much better estimates of body fat percent. Skinfold prediction formulas developed in Singapore adults generally resulted in valid predicted values in adolescents. Also, predicted body fat percent from BMI based on formulas developed in adult Singaporeans, showed little bias in adolescents, thus enabling the application of one set of prediction formulas for body fat percent based on skinfolds or BMI from age 12 years onwards.

When compared with Caucasian data of adolescents of the same age, Singaporean adolescent females generally have more body fat than Caucasians of the same weight, height and age (or body mass index). For Singaporean male adolescents the differences in body fat are negligible small compared to Caucasians of the same sex, weight and height.

The data confirm earlier findings in Singaporeans children, adolescents and adults and are in line with general findings that 'Asians' have more body fat compared to Caucasians.

S1-4

Differences in fat distribution among European, Maori, Pacific Island and Indian people in New Zealand

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Increased body fat and in particular central body fat are identified as risk factors for life style diseases such as Type 2 diabetes mellitus, cardiovascular disease and hypertension. It is also known that fat distribution varies by gender, age and ethnicity. To date 930 volunteers aged 18-80y (208 Maori, 208 Pacific Island, 344 European), 170 Indian) have been scanned with the same dual energy X-ray absorptiometer and total body fat and fat content of the abdominal and gluteal regions measured. For the same body mass index (BMI) Pacific Island volunteers had less percentage body fat (%BF), and Indian volunteers more %BF than Maori and European. For the same %BF there were between 8-9 BMI units difference between Indian and Pacific. Indian had the highest percentage abdominal fat but the ratio of abdominal fat to gluteal fat was highest in Pacific and lowest in European. Leg length relative to body height was greatest in Pacific and least in Maori. Given the increasing prevalence of obesity and its comorbidities these and other anthropometric differences by ethnicity need to be considered in relation to other risk factors when setting cut-off or action points for interventions related to obesity.

S1-5

Leptin profile, body composition and metabolic features of Omani obese subjects

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Leptin plays an important role in weight regulation and metabolic syndrome. Oman has a high prevalence of diabetes and metabolic syndrome. Obesity and fatness are considered leading causes for increasing prevalence of diabetes worldwide. 35 Omani obese (35females and 10males) and 20 non-obese subjects were studied. Leptin levels, body composition, waist and hip circumference, lipid profile, fasting insulin and oral glucose tolerance test (OGGT) were performed and measured.

The leptin levels were significantly ($p < 0.001$) higher in obese (34.78 ± 13.96 ng/ml) compared to non-obese subjects (10.6 ± 4.2 ng/ml) and were higher in females compared to males ($p < 0.05$). There was a strong positive correlation between leptin levels with weight, BMI; fatness and waist circumferences. Majority of obese subjects showed to have high levels of fasting insulin. Using fasting blood glucose and OGGT; five subjects were found to have impaired fasting glucose; 6 with impaired glucose tolerance and 4 with diabetes mellitus. Most of obese subjects showed to have desirable triglyceride levels, but some showed to have modest increase in total cholesterol and LDL-cholesterol levels, while few showed to have low HDL-cholesterol levels.

We conclude that serum leptin levels are higher in Omani obese subjects and their metabolic features are close to other ethnic obese subjects.

Markers of adiposity and health outcomes in Asian populations

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Obesity, and in particular abdominal obesity, is a major public health problem in Asia and its increase is associated with escalating levels of type 2 diabetes, hypertension and cardiovascular disease. However, no systematic compilation of data or analysis of the association between markers of adiposity and ill health have been performed for the region and there remains considerable uncertainty about how best to define obesity in Asia and how to identify those most at risk of weight-related disease. It remains unclear whether current definitions of obesity developed for Western populations are applicable to populations from Asia. For example, there is now some data suggesting that the relationship between body fat and disease varies between ethnic groups, with Asian populations experiencing high levels of disease at much lower levels of BMI than European populations. However, the issue of how best to define adiposity in Asians (by BMI alone, BMI and Waist, waist alone, waist-hip ratio etc) remains unresolved. These and other uncertainties were highlighted at a recent WHO Expert Consultation on Appropriate BMI for Asians in Singapore. To inform continued analysis by WHO on this matter, a program of research has been established under the International Obesity Task Force. The overall objective of this initiative is to provide systematic assessment of the relationship between markers of adiposity (BMI, waist circumference, waist:hips ratio) and morbidity (diabetes, hypertension) within Asian populations. Research groups and government agencies from across Asia were invited to participate by providing datasets or undertaking agreed analysis on their own data. To this point, data has been provided by researchers in Hong Kong, India, Philippines, Singapore, Taiwan and Thailand and in a preliminary analysis this was compared against data from Caucasian groups in Iran and the USA. As expected, both the prevalence of diabetes mellitus and hypertension increases continuously with BMI and waist circumference in men and women in the eight populations included in the present analyses. The difference between Asian populations and between Asian populations and Caucasian populations does not appear to be clear-cut. We are in the process of conducting more detailed analyses and are currently seeking additional datasets for inclusion. In particular, we will be examining whether there is a difference in the risk of BMI associated co-morbidity, at a given BMI, across populations and which anthropometric measurements are best able to predict risk.

Evidence based classification and criteria of obesity in Japan

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In 1997, WHO initiated the educational movement of International Obesity Task Force (IOTF), and proposed the criteria of overweight and obesity as BMI ≥ 25 and BMI ≥ 30 , respectively. If we consider BMI ≥ 30 as obesity, we can not explain the rapidly increased incidence of obesity-related diseases in Japan since prevalence of obesity in this criteria is less than 3%.

The epidemiological study based on 150,000 Japanese subjects revealed that when morbidity rate in BMI 22 was estimated as 1, odds ratio over 2 times were BMI 25 in hypertension, hypertriglyceridemia and hypo-HDL-cholesterolemia, BMI 29 in hypercholesterolemia, and BMI 27 in diabetes.

Taken together, JASSO committee decided to define BMI ≥ 25 as obesity. This criteria has been also accepted to use the criteria of obesity in the committee of Asia-Oceania Region in IASO and WHO Western Pacific Region.

It is also recognized that fat distribution is closely related to the morbidity of obesity independent of degree of obesity. In Japan, it has been revealed that visceral obesity is a major risk factor for obesity-related chronic diseases. Thus, JASSO committee proposed the criteria for pathological obesity in the following condition: In subjects with BMI ≥ 25 associated with either condition: 1) associated with obesity-related chronic diseases, or 2) confirmed visceral obesity by CT Scanning.

In summary, we propose that different criteria and classifications are necessary in different folks and ethnics.

Trends and disease risks of obesity in Chinese populations

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The Working Group on Obesity in China (WGOC), under the support of International Life Sciences Institute (ILSI) focal point in China, organized a meta-analysis on the relation between BMI, waist circumference (WC) and risk factors of related chronic diseases.

A total of 13 population studies met the criteria for inclusion, with data of 239 972 adults (20-70 years) surveyed in the 1990s. Data on WC was available for 111 411 persons and data on serum lipids and glucose were available for more than 80 000. The study populations located in 21 provinces, municipalities and autonomous regions in mainland China as well as in Taiwan. Each enrolled study collaborating Institution provided data according to a common protocol and uniform format. The results have shown that the prevalence of hypertension, diabetes, dyslipidemia and clustering of risk factors all increased with increasing level of BMI or WC. BMI at 24 was the point with best sensitivity and specificity for identification of the risk factors, and was recommended as the cut-off point for overweight. BMI at 28 which might identify the risk factors with specificity around 90% was recommended as the cut off point for obesity. WC beyond 85 cm for men and beyond 80 cm for women were recommended as the cut-off points for central obesity.

In conclusion, analysis of population attributable risk percent illustrated that reducing BMI to normal range (< 24) could prevent 40%-50% of risk factor clustering. Treatment of obese persons ($\text{BMI} \geq 28$) with drugs could prevent 15% - 17% of risk factor clustering. Controlling WC (< 85 cm for men and < 80 cm for women) could prevent 47% - 58% of risk factor clustering. Based on the results, the classification of overweight and obesity for Chinese adults was recommended.

Factors determining obesity in the Arab countries

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Obesity has reached an epidemic condition in most Arab countries, among both children and adults. Using the body mass index (BMI) as an indicator, the prevalence of overweight and obesity was about 6% among preschool children, increased to 20-25% in school children, 25-45% in adolescents, 40-60% in adult males and 45-70% in adult females. Several factors contribute to the high prevalence of obesity in this region. Food habits have changed dramatically to become more westernized with high intake of energy, fat, sugar and meat. For example, the daily per capita intake of fat in Saudi Arabia increased by 143% during 1971-1997. Decrease in physical activity and practicing exercise, is another important factors. In a study in Bahrain, it was found that the practicing exercise among men decreased from 20% at age 30-49 years to 7.5% at age 50-79 years. Television occupied most of leisure time of the people in this area, especially among adolescents and women. Fast foods are the most preferable foods for the young people, and many of them consume such foods during watching television. Advertisements, mass media, multi-pregnancies, lack of health awareness, socio-cultural factors and body image have a significant impact on the occurrence of obesity. This paper will discuss all possible factors that determining the high prevalence of obesity in this region.

S2-5

Prevalence of obesity in under five years children: Isfahan Province, Iran 2002

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Introduction: Emerging evidence strongly suggests that obesity and overweight have reached epidemic proportions globally. Prevalence of under five year's children obesity is about 1.8 percent in EMRO (Eastern Mediterranean region). The pattern of overweight and obesity in under five year's children of Isfahan province were assessed in this epidemiologic study.

Material and Methods: In a cross sectional study, 24533 (11654 under 24 month and 12879 between 24 and 72 month) under five years child of Isfahan province which admitted to health post/center/house for well baby care or vaccination, entered to study by convenience sampling, length (under 24 month) were measured by infantometer and height (24 to 72 month) by SECA instruments. Weight were measured by SECA balance, after an interview with parent a questionnaire were completed, for gathering the demographic data and child eating pattern (breast feeding, supplemental food,...). The anthropometric data were analyzed by Epilinfo 2002 nutstat (CDC 2000 reference), and BMI percentile (BMIC) and weight for height percentile (WHC) were calculated for them. All data were analyzed by SPSS 10 software with 0.05 significance level.

Results: The survey showed that in under 24 month age group 11.3 percent had WHC between 85 and 95 and 10.9 percent had WHC more than 95. In over 24 month age group 5.1 percent had BMIC between 85 to 95 and 3.3 percent had BMIC more than 95. In this age group 3.6 percent had WHC between 85 to 95 and 2 percent had WHC more than 95. There was significant difference between male and female, rural and urban ($P < 0.05$, Mantel Haenzel chi-square) in these parameters. Eating patterns had no relation with under 24 month overweight but it had significant relation with overweight and obesity in over 24 month age group ($P < 0.05$, Rho-Spearman).

Conclusion: It seems that prevalence of overweight and obesity in under five year age group in Isfahan (Iran) is much more than regional prevalence and it need more attention to preventing an upcoming obesity epidemic in next generation.

S2-6

Prevalence and risk factors of obesity among young adolescents in Taiwan

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Obesity, defined as excess of body fat that induced health hazard, is a widespread and growing problem in the world with significant medical, psychosocial and economic consequences. The prevalence of obesity has increased substantially over the last few decades and this trend will continue not only in developed but also in developing countries. In children, the development of obesity is associated with several chronic conditions. Excess body weight in childhood is the leading cause of pediatric hypertension and is associated with high risk for dyslipidemia, impaired glucose tolerance, hepatic gastrointestinal disturbance, sleep apnea and orthopedic complications. Childhood obesity is a problem because it is an important predictor of adult obesity. About one third of obese preschool children become obese adults and one-half of obese school-age children become obese adults. Furthermore, obesity in childhood appears to increase the risk of subsequent morbidity, whether or not obesity persists into adulthood. In Taiwan, the prevalence of obesity (defined as body weight $> 120\%$ of mean body weight) in ages 12-15 children was 12.4, 14.8 and 15.6% among boys and was 10.1, 11.1 and 12.9% among girls for 1980, 1986 to 1997, respectively. A survey of Taipei children between 12 to 15 years old in 1994-1996 found that 16.6% of boys and 11.1% of girls are obese, whilst an additional 11.6% of boys and 10.2% of girls were overweight. These results showed that the problem of overweight and obese among children and young adolescents in American and Taiwan are similar important and seriously. The causes of obesity are complicated and are still controversial in humans. However, it is clear that a positive energy balance where energy intake from food exceeds energy expenditure in physical activity is strongly associated with weight gain and the development of obesity. Most families and twins studies have clearly demonstrated that genetic components play a significant role in the cause of obesity among childhood. The heritability of body fatness and body fat distribution was around 70%. Socioeconomic status, region of residence, patterns of transportation, household working and leisure-time activities (such as watching television, using computers and playing electronic games) are important environmental factors that associated with the development of obesity among young adolescents. Diet patterns and food compositions also play a significant role in obesity but do not identify the cause of obesity in youth. In Taiwan, further nutritional studies are needed for youth to evaluate the association between diet patterns and food intakes on the development of obesity among this specific population. In conclusion, the prevalence of overweight and obese among youth increased steady over the period from 1980 to 2000 in Taiwan area. Since obesity in adults is associated with many chronic disorders that support the strategy of prevention of excess weight gain and obesity early in life to decrease the risk of chronic diseases in later life is the most appropriate way on managing of obesity.

Treating childhood obesity: options and outcomes

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There is a growing interest in the management of childhood obesity and effective treatment of childhood obesity is vital. This is because of its prevalence, the associated medical and psychosocial morbidity that is present in childhood and the future health consequences in adulthood. There are a many reported programs to treat childhood obesity. If randomised controlled trials (RCTs) of lifestyle interventions are selected the number of programs is much reduced. In addition most studies have small subject numbers and significant attrition, and are generally undertaken in hospital or university sites, with well-motivated subjects. Such observations make it difficult to generalise about more universal application. Given the prevalence of child obesity, programs need to be cost-effective and deliverable at primary care or community level. There are limited data on the optimal components of a program to treat childhood obesity and available data will be considered. A better understanding of what induces behaviour change in families, and strategies to better engage families are required. Parents often fail to recognise obesity in their child or have concerns about adverse effects of a management program. Adolescents are generally viewed as a more difficult therapeutic group. No lifestyle RCT on adolescent obesity has been reported for over 15 years. In addition, outcome data are almost exclusively changes in the degree of overweight. It is important to consider other outcomes of success including improvement in markers of morbidity and broader health outcomes.

The messages for child obesity management should be consistent with the messages for the prevention of overweight and obesity. National guidelines for child obesity management, which are developed from an existing evidence base, can be used to frame future research questions. The accumulation of research knowledge needs to occur in parallel with the continuing management of childhood obesity.

The role of exercise in combating childhood obesity

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The trend for an increasing proportion of adults classified as overweight/obese is also being mirrored in children. Evidence suggests that over fatness in young people is associated with health problems such as hyperinsulinaemia, hypertension and a poor blood lipid profile even in childhood. There is evidence that being overweight/obese in childhood, but particularly adolescence, tracks into adulthood. Clearly therefore, intervention with at risk young people may help to combat future adulthood obesity, consequently a multidisciplinary approach to the treatment of obesity is now used with exercise playing a key role.

The misconception that overfat children are unfit in comparison to their normal fatness peers may have arisen through the inappropriateness of measuring and expressing "fitness" in relation to body size. When overfat children's aerobic fitness is measured and expressed more fairly using allometric scaling techniques, their cardiopulmonary fitness falls within the normal range. The research evidence, on balance, suggests that obese and overweight youngsters are less physically active than their normal weight peers, but due to their greater body mass may expend more energy during these physically active periods. The use of exercise training as a tool to reduce body fat percentage in overfat children has generally had favourable results with reductions of approximately $\leq 10\%$. Such programmes have often used a combination of diet modification, education and exercise to achieve the desired goal. Similar results are also seen with exercise only treatment programmes. For both types of programme however, the time taken to achieve significant fat loss is often quite long and the permanency of the body fat reduction often short lived once the programme ceased.

In conclusion, there appears to be a role for exercise within both a multifaceted and unifaceted programme. Encouraging overfat children to become and then to remain habitually physically active, can play an important role in their weight management throughout their life.

New BMI-for-age growth charts for Singapore children: need for locally relevant charts for obesity diagnosis

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An anthropometric study was conducted among 13 863 school children aged 6 to 18 years in 2002 to establish locally relevant BMI-for-age charts and to validate screening/diagnostic tools for body composition. This set of charts will complement the recently established BMI-for-age charts among preschoolers.

A team of trained nurses took the anthropometric measurements in 24 schools (10 primary schools, 10 secondary schools and 4 junior colleges/centralised institutes over a period of 6 months.

Generally, there has been a significant increase in weight of 2.4 kg and 2.2 kg for boys and girls (after correcting for age and height) respectively since the last anthropometric study in 1994 with no change in height, resulting in a significant increase in BMI of 1.1 kg/m² for both boys and girls.

BMI-for-age centile charts are constructed using Cole's LMS method. Definition of overweight and obesity using the centile charts are linked to adult cut offs positioned at age 18 years. Corresponding centile curves to two sets of adult cut offs were computed, the WHO cut offs of 25 and 30 kg/m² and Asian cut offs of 23 and 27.5 kg/m² for overweight and obesity respectively. Using existing screening data of 34,000 school children, prevalence of overweight and obesity using these two sets of centile curves were compared. Using WHO cut offs, the overall prevalence of overweight and obesity is 9.1% and 15.6% for girls and boys respectively. Using Asian cut offs, the prevalences rise to 16.7% and 25.4% respectively. The choice of cut offs and its public health implications will be discussed during the presentation.

An obesity epidemic associated with unhealthy lifestyle among 10- and 11-year-olds in four Asian cities

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This reports a cross sectional survey of the diet and physical activity knowledge, attitudes, and practices (KAP) and overweight and obesity among 1,519 10- and 11-year-olds (50% males) from Bangkok (n=367), Hong Kong (n=364), Kuala Lumpur (n=488), and Manila (n=300). Data was collected as health communication needs assessment, and for cross-city comparison. Researchers from each city together developed the study, and separately administered the questionnaires to subjects in 3 to 5 schools, also measuring subjects' heights and weights. Childhood overweight and obesity according to an international reference were firmly established, with 18.6% overweight and 7.2% obese, with higher rates in the boys and in Bangkok and Manila than in Kuala Lumpur and Hong Kong. Their main healthy eating information sources were family (77%), school (76%), doctor (63%) and television (56%). Subjects had acquired a certain amount of healthy eating and physical activity knowledge, knowing some favorite foods were healthier than others. Around half of them reported choosing their own meals and snacks, but what they choose was not consistent with their knowledge. Only 21% reported eating a lunch with more vegetables than meat. Favorite snacks included potato chips and similar snack foods, biscuits, and chocolates. Although 97% report liking sports, much television watching (135±108 min on weekdays and 227±176 min on weekend days) and "playing computer" (61±76 min on weekdays and 95±107 min on weekend days), was reported, along with mainly taking exercise in PE classes, and on weekends and holidays. Homework (45%), lack of time (39%), preferring other pastimes (30%), and too hot (24%) were their main reasons for not taking more exercise. In conclusion, while healthy living messages are reaching these students enough to affect their knowledge and attitudes, they do not deliver the skills and enhance support needed to apply that knowledge and adopt healthy behavior.

S3-5

A study of overweight and obesity among school children in Manila

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The primary purpose of the study was to gather data that will assist authorities in planning and implementing nutrition education programs focused on the growing problem of obesity and overweight in children. The study covered 1208 children, 8 – 10 years of age, who were randomly selected from all public (PuS) and private (PrS) schools from the City of Manila. Apart from weight and height measurements, data on the children's dietary and physical activity pattern, together with information on nutrition-related KAP of the children and their parents, were gathered. On the average, PrS children were much taller and heavier and had higher BMI than PuS children, resulting in a much lower prevalence of undernutrition and a much higher prevalence of overnutrition. Children from PrS, which are generally of higher socio-economic status, tended to take larger amount of food and more animal foods, fats and oils, and beverages, resulting in a higher caloric, protein, iron and vitamin A intake, compared to children from PuS. Moreover, PrS children were performing a lower level of physical activity; more were riding a motor vehicle to school instead of walking; and preferring TV and computer games over outdoor games. The data indicate that private schools should begin to look at the emerging problem of overnutrition and the role of physical activity program in the health of children, and consider the important role of parents/guardians, teachers and TV in this regard.

S4-1

Hormones and obesity: What is relevant?

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Obesity may be a consequence of excess or deficiency of certain hormones or as a consequence of the side effects of these hormones. The role of specific hormones in terms of regulation of adipose tissue function is best exemplified by the peptide Leptin, which is synthesized by fat cells in response to fat deposition and has effects at the hypothalamus to suppress appetite as well as stimulate release of anorectins and stimulate utilization of fat eg via secretion of tumour necrosis factor alpha. In most obese patients however, there is resistance to leptin hormone action. Serum leptins are usually high but the appetite does not appear suppressed.

The adipocytes or fat cells however are now known to produce many other newly identified hormones and peptides, the function and regulation of which are still being clarified.

Other hormones are also well known to cause obesity. Glucocorticoids such as cortisol cause central obesity if present in excess, and weight loss if deficient as in Addison's disease. On other hand obese persons also have raised cortisol. The question is which comes first: the raised cortisol or the obesity? Will lowering plasma cortisol medically in obese patients cause weight loss?

Insulin is a hormone of plenty, secreted during periods of feeding. Insulin results in deposition of glycogen and inhibition of lipolysis. Excess insulin causes hypoglycaemia and increased appetite and weight gain. Excess insulin is seen in metabolic syndrome with central obesity etc. However in this syndrome, there is insulin resistance, and yet there are manifestations of insulin excess such as on the skin.

The gonadal steroids also appear to play a role in weight regulation and obesity. Hypogonadal men tend to be obese. Women tend to gain weight when given hormone replacement therapy.

Thus at present stage of our knowledge, the role of hormones in causing obesity in terms of clinical relevance is still limited except to exclude certain conditions associated with obesity such as insulin resistance, hypogonadism and steroid excess.

S4-2

Epidemiology on obesity and cardiovascular risk factors in South Korea

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The aim of this study was first, to investigate the prevalence of obesity, abdominal obesity, and clustering of cardiovascular risk factors, and secondly, to identify the BMI or waist circumference (WC) level at which clustering increases in South Koreans. A population-based, cross-sectional National Health Examination Survey was carried out in 1998. A total of 8,816 subjects (4,029 men and 4,787 women) aged 15-79y were selected by stratified multistage probability sampling design. The measurements taken of the subjects included: height, weight, waist and hip circumference, blood pressure, fasting glucose, and lipids. The prevalence of BMI ≥ 25 kg/m² was 25.3% for men and 28.3% for women. The prevalence of WC >90 cm in men, and >80 cm in women was 18.5%, and 38.5%, respectively. Clustering of 3 or more cardiovascular risk factors was 22.7% in men and 21.7% in women. Using <21 kg/m² as a referent, subjects with BMI of 23 kg/m² and 27 kg/m² had the odds ratio of 3.5 and 10.2 in men, and 3.1 and 6.7 in women, respectively for clustering of cardiovascular risk factors. Using <65 cm as a referent, subjects with a WC of ≥ 90 cm in men and ≥ 85 cm in women had an odds ratio of 13.4, and 13.6, respectively for clustering of cardiovascular risk factors. Considering the significant associations between clustering of cardiovascular risk factors and BMI or WC, the present study suggests that the large number of South Koreans may have important implications for health care even at a lower level of BMI or WC.

S4-3

Prevalence of metabolic syndrome among Filipino adults aged 20 years and over

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This study sought to determine the prevalence of metabolic syndrome, using data collected from 4,541 adults covered in the 1998 National Nutrition Survey. The metabolic variables analyzed were: total cholesterol, LDL-c, HDL-c, triglycerides and fasting blood sugar (FBS). Measurements of obesity such as body mass index (BMI), waist-to-hip ratio (WHR) and waist circumference (WC) as well as blood pressure were also taken. Results showed that in general, the proportion of subjects with co-morbidity factors increased with higher levels of FBS, except for high cholesterol wherein no pattern was established. The highest prevalence of high FBS was found in both males (35.8%) and females (14.5%) with the following combined characteristics: high BMI, high WHR and high WC. Males with co-existing high BMI, high WHR, and high WC were observed to have the highest prevalence rate of hypertension (66.5%). Among females, the highest prevalence rate of hypertension (37.9%) was seen among those with high FBS. Males and females with high WHR have an estimated odds ratio of having high FBS of almost six and five times respectively compared to those with normal WHR. The odds of high FBS among females was five times among those with triglyceride level $>$ than 200 mg/dL. Univariate analysis showed that males and females with high WC generally provided greater risk to dyslipidemia compared to those who were overweight and obese as well as those with android obesity. Android obesity for males and high WC for females were better predictors of risk to high FBS. These findings showed that the prevalence rate of metabolic syndrome is 0.28%, based on the number of individuals with the following combined characteristics: high FBS, hypertensive, android obese, with body mass index (BMI) of ≥ 25.0 and high WC. Females had almost twice the rate than males. Considering that metabolic syndrome, with its co-morbidity factors is prevalent among some Filipino adults aged 20 years and over, it is recommended that health programs geared towards minimizing the morbid risk factors be properly developed, promoted and fully implemented.

Childhood obesity and metabolic syndrome

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This study was conducted in two centers namely Kuala Lumpur and Kota Bharu. A total of 12, 681 children 9 to 11 years old, attending primary schools both in Kuala Lumpur and Kota Bharu were screened. Their height and weight were measured and sociodemographic data collected using a questionnaire. There are 5047 children (2668 boys and 2379 girls), attending 14 schools in Kuala Lumpur. The remainder 7634 children (3778 boys and 3856 girls), attending 21 schools are sample from Kota Bharu. Their demographic background, perception, food habits, nutrition knowledge and physical activity were evaluated using the questionnaire. Overweight problem includes children who are obese and those at risk of obesity based on WHO reference 1995 (BMI-for-age \geq 95th percentile = obesity, 85th percentile \leq BMI-for-age $<$ 95th percentile = at risk of obesity). The results show that the overall prevalence of children having overweight problem in Kuala Lumpur is 912 (18.1%) of which 437 (8.7%) are obese. There are 956 (12.5%) overweight children in Kota Bharu whereas 437 (5.7%) are obese. The prevalence of overweight problem is significantly higher in boys than girls in Kuala Lumpur ($p < 0.05$). However there is no significant difference between boys and girls in Kota Bharu. The study also found significant difference among prevalence of overweight problem with increasing age ($p < 0.05$) in Kuala Lumpur and Kota Bharu. This finding implies that pubertal changes and body image may contribute to this difference. The expectation that the prevalence of overweight problem is lower in Kota Bharu as compared to Kuala Lumpur was not true. This indicates that Kota Bharu being less urbanized than Kuala Lumpur has obesity problem comparable to the Federal Territory. The other sociodemographic findings will be discussed in the main paper. To relate childhood obesity and metabolic syndrome, Sekolah Kebangsaan Sri Delima, the school with a high prevalence of overweight and obesity (18.3%) was selected for clinical screening and intervention. All the overweight and obese children ($n=66$) and control ($n=34$) were examined clinically for FSL, FBS, OGTT, C-peptide, insulin and leptin. The data showed 1 out of 66 overweight and obese children was diagnosed diabetic (1.5%), 5 were diagnosed IGTT (7.7%) and 19 were dyslipidaemic (29.2%). Education intervention packages including diet, physical activity and psychosocial aspects were prepared based on parameters collected. These packages were implemented to the overweight and obese children with their parents both at the hospital and school. Preliminary results show improvement in weight change, % body fat, physical activity and dietary intake among these children.

Standard of living index, body fat and insulin resistance in middle-aged Indian men in villages, slums and urban middle class

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Lack of a standard tool to assess socio-economic status (SES) has hampered studies to investigate its role in the epidemic of obesity and diabetes in India. Recently National Family Health Survey (NFHS-2) has evolved Standard of Living Index (SLI) as a standardised approach to study SES. We used SLI in CRISIS study (Coronary Risk of Insulin Sensitivity in Indian Subjects) to assess the contribution of SES to obesity and diabetes in middle-aged men in villages, slums and urban middle class population in and around Pune ($n=441$).

Forty eight percent rural and 60% slum men had low SLI (lowest third), while 81% urban middle class men were affluent (upper third). Twenty two percent rural, thirty six percent slum and seventy percent middle class men were adipose (body fat $>25\%$, by bioimpedance). Insulin resistance (HOMA-R) progressively increased from rural (0.98), to slums (1.33) and middle class (1.91, $p < 0.001$ for trend) as did prevalence of hyperglycemia and other related cardiovascular risk factors. Duration of urban exposure was strongly predictive of SLI, obesity and diabetes ($P < 0.001$) while migration frequency was predicted by lower SLI ($p < 0.01$). SLI was strongly related to body mass index (BMI, kg/m^2), adiposity and diabetes ($p < 0.01$, all), independent of geographical location ($p < 0.01$).

Thus, higher living standards predict obesity, insulin resistance and diabetes irrespective of rural or urban residence. These findings are different than those in the developed countries where there is a reversal of SES gradient for these conditions. Preventive measures to curtail the diabetes epidemic will have to be concentrated in those with higher SLI in India.

S5-1

The endocrine and signalling role of adipose tissue in obesity

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Although the rapid and continuing rise in obesity is clearly a consequence of changes in lifestyle, it has provided impetus to the investigation of the fundamental mechanisms involved in the regulation of energy balance. In the genomic era, this has included a search for those genes, or gene polymorphisms, which predispose to obesity. At a mechanistic level, important developments have occurred recently in the identification of novel neuropeptides involved in the control of appetite, such as the orexins, while the discovery of new uncoupling proteins (UCP2, UCP3, UCP4) was initially thought to provide a locus for adaptive thermogenesis in skeletal muscle and other organs outwith brown fat. A radical change in perspective on energy balance has come from new understanding of the function of white adipose tissue (WAT). The view that WAT is simply a lipid storage depot has been replaced by the recognition that it is an endocrine organ, communicating both with the brain and peripheral tissues through the release of leptin and other hormones. Leptin is secreted principally from adipocytes and acts as a critical signal in energy balance and other physiological processes. This hormone is one of a rapidly growing list of protein signals and factors released by WAT. These adipokines include the hormones adiponectin and resistin (implicated in insulin resistance), classical cytokines such as IL-6 and TNF α , as well as proteins involved in vascular haemostasis (e.g. plasminogen activator inhibitor-1), lipid metabolism (e.g. retinol binding protein), the complement system (e.g. adipsin) and the acute phase response (e.g. haptoglobin). The adipokines provide an extensive communication network between adipose tissue and other organs and some, such as plasminogen activator inhibitor-1, are directly implicated in the pathologies associated with obesity.

S5-2

Determinants of activity energy expenditure

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Objective: The main determinants of daily energy expenditure are body size and physical activity. Activity energy expenditure is the most variable component of total energy expenditure. It was assessed whether the physical activity level in confined conditions is an indicator of free-living physical activity.

Research Methods and Procedures: Activity energy expenditure was measured over one day in the confined environment of a respiration chamber (floor-space 7 m²), where activities were restricted to low intensity activities of daily living, and over 2 weeks in the free-living environment with doubly labeled water. Subjects were 16 women and 29 men (31 \pm 10 y; 24.2 \pm 2.7 kg/m²; means \pm SD).

Results: The free-living activity level of the subjects, total- as a multiple of resting energy expenditure, was 1.76 \pm 0.13. Activity energy expenditure in the chamber was 47 \pm 13% of the value in daily life, and the two values were correlated ($r=0.50$, $p<0.001$; partial correlation corrected for age, gender and BMI: 0.40, $p<0.01$). The chamber value explained 25% of the total variance in free-living activity energy expenditure.

Discussion: The activity level of a subject under sedentary conditions is an indicator for activity energy expenditure in daily life, showing the importance of non-exercise activity for daily energy expenditure.

S5-3

Metabolic predisposition to obesity in Malaysians with particular reference to energy expenditure

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Studies over the past decades have suggested significant inherited differences in various compartment of human energy expenditure, namely, low basal metabolic rate (BMR), low daily energy expenditure (24 h EE), low energy cost of physical activity, reduced thermogenic response to a meal and low capacity to oxidize dietary fats. While most energy expenditure studies in overweight and obese subjects were reported among Caucasians, similar studies in Asian population are scarce. It is imperative that we assess metabolic efficiency in these populations in order to determine the poorly known contribution of reduced energy expenditure in the etiology of obesity, since variations in energy expenditure does exist even when comparison are made in normal weight individuals. The prevalence of overweight and obesity in both adult and children in Malaysia is on the rise, implying that there have been changes in the society that contribute to weight gain by promoting caloric imbalance. This paper will attempt to highlight results of several studies suggesting that Malaysians in general, have a largely sedentary lifestyle, their BMR and metabolic costs of habitual activities are lower as compared to Caucasians and that their TDEE are lower than the current RDA for energy. The above phenomenon could well be the key factor that triggers weight gain in the Malaysian population over the last decades.

S5-4

Glycemic index and satiety in obese Mexican with type 2 diabetes

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Obesity is associated to type 2 diabetes, and the perception of hunger is one of the main problems for diet adherence. The aim of this study was to evaluate the effects of mixed meals with different glycemic index (GI) on satiety in people with type 2 diabetes who are overweight or obese.

In this study nine women and one man, 30 to 60 years of age, with diagnosis of type 2 diabetes, and body mass index higher than 27 kg/m², were randomly allocated to each of the experimental diets. After one week of the first experimental meal, a second meal was assessed. Each experimental meal had 500 calories. One of the experimental meal had lower than 60 GI diet and the other higher than 80 GI diet. Before and after the experimental meal, satiety was assessed through a seven point visual analog rating. Data was analyzed by using the incremental technique under the curve during 240 minutes. Satiety differences between experimental meals, was calculated by rank differences (Wilcoxon test). The result did not show statistical differences in the exercise during the previous day or in the postmeals palatability ratings. The mean satiety perception (area under the curve) was highest for the low GI experimental meal ($P < 0.05$).

S5-5

Energy homeostasis and brown adipose tissue

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The brown adipose tissue (BAT) roles as a major site of non-shivering thermogenesis that is important for the regulation of the body temperature and body weight. In addition, BAT has also been suggested to play a role in energy homeostasis through its endocrine function. However, there are important questions surrounding, for example, the differentiation of white adipose tissue (WAT) vs. BAT, the function of BAT in obesity, and the role of neonatal BAT in which no white adipose tissue is formed. To understand these functional aspects of BAT, we produced a transgenic mouse line in which BAT could express HSV-TK from the UCP1 promoter and be conditionally ablated by the administration of Ganciclovir (GCV), a genotoxic substrate for HSV-TK protein. The expression of HSV-TK transgene was mild but BAT-specific in our transgenic mice. Treatment of GCV to adult mice caused functional atrophy of brown adipocytes leading to transdifferentiation into white adipocytes. On the contrary, UCP-TK neonates from the GCV-treated pregnant mice died after birth with defects in energy metabolism of liver as well as the function of BAT. From this study, we could understand more about the transdifferentiation mechanism of brown adipocyte to white adipocyte seen in mouse and human obesity model and propose that the UCP-TK mice can be a useful model system in the research of the BAT physiology. Furthermore, observing the defects in energy metabolism of GCV treated UCP-TK neonates, we could conclude that the fetal BAT has more active functions in controlling the energy homeostasis as well as the regulation of body weight and temperature.

S5-6

The role of dietary carbohydrate in the development of obesity

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The increasing prevalence of obesity around the world is associated with changes in diets that are becoming richer and lifestyles more sedentary. The percentage of energy from dietary fat has long been considered a primary determinant of body fatness. Several observational studies found an inverse relationship between energy intake from fat and from sugar, but not between fat and starch intake. Besides the absolute sugar intake, the ratio between intake of fat and sugar may be important in body-weight regulation. Recently, some doubts have arisen about the protective role of carbohydrates around which energy balance is regulated and body weight controlled. Several rigorous tests of carbohydrate-specific models of feeding have suggested that carbohydrate oxidation or stores per se do not exert powerful unconditioned negative feedback on energy intake. In a series of studies, we have showed that the addition of mandatory snacks rich in sugar, fat or starch (energy density: 550 kJ/100 g) led to elevated energy intakes over 7 d in men, women and lean and overweight subjects. In these studies, energy density, palatability, taste, texture and appearance of these snacks were equalised across treatments. The remainder of the diet was consumed *ad libitum* and consisted of a counterbalanced selection of high protein, high carbohydrate and high fat foods. Subjects did not compensate at all for the high fat snacks and only compensated by 20–30% for the high sugar snacks. The same difference occurred between the carbohydrate treatments and the fat treatment, with greater compensation of ~ 0.7 - 1.0 MJ/d on the high carbohydrate treatments. There is little evidence from these studies that sugars and high GI starches are different in terms of satiety or energy intake. The intake-promoting effect of the high-sugar diet was likely due to the sensory stimulation to eat associated with sweet foods.

S6-1

Physical activity and exercise – the enabling instruments

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There are four health-enhancing activities, which have great potential to enhance longevity as well as quality of life. These are: diet and weight control, exercise and physical fitness, risk management (of risk factors for disease) and "preventive maintenance" of the body. These are all interrelated and work symbiotically. Although the principles, which govern their application are now fairly well understood there appear to be barriers to bridging the divide between knowledge and its application both at a personal level and by communities. Public authorities have to find strategies that will be able to bridge these gaps. A motivating feature is that such health enhancing activities, far from being difficult to implement, can be readily integrated into most people's lives by making relatively minor adjustments to their daily routines. On an individual level, all it requires is the personal decision to make the change, the commitment to see it through and the motivation to sustain it. At the community level, the government and public authorities have to provide the awareness, the know-how and the 'enabling/facilitating environment'. Exercise can be both 'formal' as well as 'incidental'. Formal exercise is planned, measured and requires some level of organization and self discipline whilst incidental exercise can be realized through sustained behavioral changes such as walking/cycling instead of driving, climbing stairs instead of taking elevators, etc. One could also incorporate some exercise routines at the desk. Promotion of a healthy lifestyle can be integrated and emphasized in national health policies as well as incorporated into national development plans. These policies then can be translated into programs. These can have a number of associated programs such as 'Sports for All', 'a Fit Nation' etc. Resource allocation can then reflect this inclusion. Such policies have to be broad based and beyond the realms of Health Ministries alone. Hence, there would be a need for intersectoral collaboration and an integrated approach, involving many other agencies. For example facilities have to be provided for in housing areas, schools, workplaces as well as appropriate recreational areas. Synergies and smart partnerships have to be forged with the private sector as well as NGO's to achieve these objectives. Some of these initiatives may need appropriate legislation to be passed. Public awareness and participation campaigns can be started involving the media as well as other forms of advertising. These can include jingles, brochures etc. Events encouraging mass participation such as big walks and family runs can be engendered. Systems for rewards, recognition, incentives (or even disincentives) can be instituted to further motivate participation. Appropriate tax incentives may be offered. Programs and facilities provided for these activities will have to take into consideration cultural and social sensitivities and appropriately adjust for them.

S6-2

Physical activity & nutrition programs in the USA: Unique characteristics and components of school interventions

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Low physical activity levels and poor dietary choices have been identified as contributing to the rising prevalence of obesity and non-insulin dependent diabetes mellitus in young people in the United States (US). According to the Centers for Disease Control and Prevention (CDC), 51% of children and adolescents eat less than one serving a day of fruit, and 29% eat less than one serving a day of vegetables that are not fried. In addition, the CDC reports that only 8.0% of elementary schools, 6.4% of middle schools, and 5.8% of high schools provide daily physical education or its equivalent for the entire school year for students in all grades in the school. Because children and adolescents spend a major portion of their time in schools and evidence suggests a link between health and learning, it makes sense that schools provide an environment that promotes healthful nutrition and physical activity habits. This presentation reviews the research on and explores the unique aspects of physical activity and nutrition-related school interventions in young people. Several school-based efforts have produced successful results including integrating physical activity and nutrition education into academic lessons, improving the quality of physical education, and enhancing school policies to improve health programming. Programs and resources including Planet Health, TAKE 10!, SPARK, CATCH, CDC School Health Index, and others will be reviewed. Future studies should examine creative school interventions that enhance health, while encouraging student learning and improving classroom behavior, and promote physical activity and nutrition in young people and their families in the home and community settings.

S6-3

Physical activity intervention programs – impact and sustainability

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The health benefits of physical activity are well established and a major goal of governments, including Australian health authorities, is to identify strategies to reduce the proportion of the population that are sedentary and overweight. Physical activity contributes to a lower risk of coronary heart disease, and other chronic diseases including obesity, hypertension, type 2 diabetes, colon cancer, osteoarthritis, and osteoporosis. From a health perspective, including for weight management, the sedentary individual has the most to gain when moving from a completely sedentary lifestyle to progressively higher levels of physical activity and exercise. Convenience has been consistently cited as an important factor in decisions to take up and continue a more physically active lifestyle. Therefore, more accessible facilities, reduced travelling time, expenditure, and disruption of other activities may all contribute to activating sedentary and obese individuals. Changes in both the environment and infrastructure initiatives that promote physical activity should be considered together with the encouragement of positive beliefs, attitudes and knowledge of physical activity. This paper addresses the importance of a multi-sectoral approach with an emphasis on development of community capacity, and through it, sustainability of improvements in physical activity. In order for maximum benefits to be derived from physical activity interventions for weight management, greater emphasis is needed in matching physical activity promotion strategies for the population with optimal exercise prescription to meet individual needs and expectations.

S6-4

Promoting physical activity at a national level – the Singapore experience

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In Singapore, physical activity is promoted by many organisations. Significant contributors include the Singapore Sports Council, Ministries of Education, Health, and Defence, People's Association (a Government agency), NTUC Income (a Trade Union insurance company), the various National Sports Associations, private health/fitness clubs and centres, and multinational and large private companies with company fitness programmes. The main player, the Singapore Sports Council, has been promoting Sports for All since its inception in 1973, with sports facilities, programmes, services and activities for the population. The provision of sports facilities follows the Master Plan of Sports Facilities of 1975.

In 1996 a new initiative called Sports for Life (SFL) was launched to further promote sports and physical activity, targeting the least active segments of the population - housewives, senior citizens and the working population. SFL includes programmes to teach Singaporeans sports (learn-to-play schemes), fitness evaluations (Sports for Life Walk, Sports for Life Run, and National Physical Fitness Award (NAPFA) Challenge, STEPfit) and membership in ClubFITT fitness gyms. With SFL and other programmes, the Singapore Sports Council, together with other organisations, intends to encourage more Singaporeans to be physically active especially in sports. Targets have been set aiming at 50% of the population exercising one or more times a week by the year 2005.

A nationwide survey in 1997 revealed that 34% of the population played sports one or more times a week (with 14% three or more times a week), whereas 59% were inactive. Daily physical activity, including leisure time physical activity, household chores, physical activity at work, totalled only about 88 minutes per day. In 2001, 38% played sports one or more times a week (16% three or more times a week) and daily physical activity averaged 65 minutes per day.

S7-1

The impact of orlistat-induced weight reduction on metabolic profiles, insulin sensitivity and pancreatic β cell function in obese Chinese subjects with or without type 2 diabetes mellitus

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Background: There are close associations between obesity, insulin resistance and Type 2 diabetes mellitus. Orlistat, a gastrointestinal lipase inhibitor, reduces dietary fat absorption and subsequent caloric intake. We examined the weight-losing effect of Orlistat treatment on insulin sensitivity/resistance indices and pancreatic β cell function and cardiovascular risk factors in a group of severely obese young Chinese subjects with or without Type 2 diabetes. **Methods:** Obese patients with (n=24) or without diabetes (n=26) were given orlistat 120 mg *t.i.d.* without concomitant hypocaloric diet for 6 months (BMI: 27.3 – 47.4 kg/m²). The efficacy measures were (1) insulin sensitivity indices derived from the homeostasis model assessment (HOMA-IR) and composite measure of whole-body insulin sensitivity index (COMPOSITE-IS), (2) the disposition index was computed to estimate the dynamic relationship between insulin secretion and insulin sensitivity, glycemic control, (3) glycaemic control, (4) cardiovascular risk factors including anthropometry, blood pressure, lipid profiles and albuminuria and (5) body composition by the dual-energy X-ray absorptiometry. **Results:** At baseline, patients with diabetes had lower BMI and body fat percentage but higher waist-to-hip ratio and were more insulin resistant. Orlistat reduced body weight, waist and hip circumferences, total body fat %, blood pressure, fasting plasma glucose and lipid levels, albuminuria and insulin sensitivity indices in both groups (all $p < 0.05$). Despite having less weight reduction, there was greater percentage reduction from baseline in HbA_{1c} (-13.3% vs. -3.6%, $p < 0.001$), fasting plasma glucose (-20.3% vs. -2.4%, $p < 0.001$) and systolic blood pressure (-6.5% vs. -2.7%, $p = 0.02$) in patients with diabetes. Diabetic patients had reduced insulin response compared to non-diabetic subjects at baseline ($p < 0.001$). A 4-5% weight reduction was associated with reduction in fasting, mean OGTT and area-under-the-curve (AUC₀₋₁₂₀) PG in both groups (all $p < 0.05$). For diabetic patients, there was no change all insulin levels during OGTT. By contrast, there was significant reduction in fasting, mean OGTT, insulin AUC₀₋₁₂₀ and peak insulin levels in non-diabetic subjects (all $p < 0.05$). The HOMA and COMPOSITE-IS indices improved in both groups (all $p < 0.05$). Pancreatic β cell function, as computed by the corrected insulin response, increased in diabetic patients resulting in an improvement in the disposition index. Decline in plasma triglycerides explained 31% and 21% of variability of the percentage reduction in HOMA and COMPOSITE-IS respectively. **Conclusions:** Short-term Orlistat treatment without the use of a hypocaloric diet significantly improved insulin sensitivity and cardiovascular risk profiles in severely obese Chinese subjects with or without Type 2 diabetes. There are differences in dynamic insulin responses between obese subjects with or without diabetes as well as their changes following weight reduction. Furthermore, orlistat-induced weight reduction improved pancreatic β -cell function in diabetic subjects.

S7-2

Psychobehavioral and nutritional predictors of weight change in obese patients treated with sibutramine

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Objective: To reveal whether baseline body mass index (BMI), psychobehavioral and nutritional measures were significant predictors of change in BMI over 4 month and 12 month periods for obese women enrolled in a weight reduction program which included low energy diet, increased physical activity, cognitive behavior therapy and sibutramine. The role played by changes in psychobehavioral and nutritional factors in BMI changes in response to weight loss programme was also investigated.

Design: After a double-blind placebo controlled period for 4 months, when subjects received either sibutramine (10 mg per day) or placebo, open phase continued until 12th month, when sibutramine was administered to all patients.

Subjects: 80 obese women (age: 43.9 \pm 10.6 years, BMI: 36.7 \pm 4.8 kg/m²).

Measurements: The dependent variable was change in BMI whereas baseline BMI, mode of treatment, Beck depression score, three items of the Eating Inventory (dietary restraint, disinhibition and perceived hunger), energy and macronutrient intake represented independent variables. Intakes of energy and macronutrients were evaluated by computerized programme which considered one-week dietary record.

Results and discussions: Multiple regression analysis revealed that a BMI decrease at 4th month was significantly influenced by the mode of treatment and initial BMI, whereas borderline negative relationship was observed with baseline restraint score. BMI, depression score, restraint score and total energy intake as measured at baseline predicted weight loss at 12th month. These predictive variables accounted for 43.8% of the variance in BMI decrease at 12 months. If relationships between the decrease of BMI and changes in all followed psychobehavioral and nutritional parameters were considered at 12th month of treatment, a decrease in disinhibition score of the EI remained an alone significant factor affecting the BMI decrease. This psychobehavioral change observed during the sibutramine treatment might positively affect health risks as eating behavior characterised by disinhibition has been associated with visceral fat accumulation and obesity related comorbidities. In conclusion these results suggest that certain psychobehavioral and nutritional characteristics can be used as predictors of weight loss in response to comprehensive weight management programme including the drug treatment with sibutramine.

S7-3

Sibutramine in obesity management – why and when?

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Sibutramine is a serotonin- and noradrenaline- reuptake inhibitor. It has central effects and possibly peripheral effects. It does reduce food intake (a reduction of some 10% in the energy of meals) and produces a "relative indifference" to food, rather than suppression of appetite.

WHY - Sibutramine is effective, in trials it has been shown to produce much more weight loss than placebo, and has been effective in maintaining weight lost for up to 2 years. Side effects have been relatively minor, some dryness of the mouth, a slightly elevated pulse rate (perhaps indicating thermogenesis), occasional palpitations & headache and a slight. It is necessary to check BP, though this does fall as weight loss occurs. As well with weight loss, there are falls in lipids and a surprising and maintained elevation of HDL cholesterol, better control of diabetes and other health benefits will be discussed. It is an effective and useful drug.

WHEN – Sibutramine should be considered in this with elevated BMI (>30) or in those with BMI > 27 and established risks, or in those who have not managed to lose weight after following an established weight program for more than 12 weeks. In Asia, it may be prudent to consider use in those with BMI > 25 with risks. Sibutramine is effective in some 85% of individuals and those who do not lose weight (>1.5kg) on the starting 10mg dose should be considered for up-titration of dose. Weight loss should be checked in a further month. Those with Type 2 diabetes seem to need higher doses.

Sibutramine is effective and a useful addition to our therapeutic armamentarium. It does help individuals maintain a reduced energy intake for extended periods.

S7-4

Laparoscopic adjustable gastric banding for morbid obesity – results with 7.5 ml pouch and video presentation

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Introduction: Approximately 25% of adults in Singapore are overweight and 6% are obese. Laparoscopic Adjustable Gastric Banding (LapBand, Inamed Corporation, Santa Barbara, CA) is a minimally invasive gastric restrictive surgical procedure for patients with a BMI > 40.0 kgm⁻² or > 35 kgm⁻² with co-morbidities of obesity. It is reserved for patients who have failed to lose weight by all other means, are motivated for the procedure and acceptable of the risks.

Method: LapBand was first introduced in the early 90's and obtained US FDA approval in 2002. A silicon band is used to create a small pouch high on the lesser curve of the stomach. The tightness of the band and hence diameter of the outlet is adjustable. It thus results in early satiety and decreased meal frequency. Recommended pouch size was initially 60.0 ml. It has been decreasing over the years and is now 7.5 ml. Paradoxically, this is better tolerated, weight loss is more consistent and it is associated with less reflux symptoms.

Results: We performed 17 procedures with a 7.5 ml pouch from May 2002 to Jul 2003 (Total 30 procedures, 17 with 7.5 ml pouch, 13 with 12.5 ml and 15.0 ml). We present our early results, effects on co-morbidities and a 5-min. video of the procedure.

S7-5

Effect of a novel herbal formulation containing plant extracts, amino acids and minerals in insulin resistant diabetic *db/db* and *ob/ob* mice

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Alarming increase in obesity was observed over the past decade and it is in epidemic state in US and other countries in the world. Along with the increase in body weight there is a concomitant increase in dreadful consequences like Type- II diabetes, heart disease and hypertension. Different pharmaceutical companies are facing the big challenge in developing anti-obesity medications. The obesity drug pipeline is also not that big to tackle this huge problem.

Several scientific reports showed that several plant extracts and minerals may play a key role in lowering fat mass in obese patients. To address this further we have formulated a unique herbal mixture of two plant extracts (*Ephedra free*) with minerals and some unusual amino acids in very proportionate way. We evaluated this new formulation in *ob/ob* and *db/db* mice following oral treatment.

In *ob/ob* mice after three weeks of oral treatment (20 mg/mouse), the formulations reduced 10% of body weight compared to vehicle treated animals without changing any food or water intake. It significantly reduced the circulating high insulin levels (70%), serum Triglycerides levels (42%) and total cholesterol levels (28%) compared to vehicle treated animals. In case of *db/db* mice, the formulations significantly lowered the body weight gain and blood glucose levels compared to control animals. In both models oral glucose tolerance was improved significantly after treatment with the formulations. No liver toxicity (in human hepatoma cells HepG2) was observed even after 24 hrs of incubation at a dose of 200µg/ml. The Maximum Tolerated Dose (MTD) study showed it is very safe and well tolerated even at very high dose in mice. Chronic long-term repeat dose TOX study in rats and mice did show any adverse effect.

These results show that this unique Herbamine (herbs + amino acids + minerals) formulation has the potential as a non-appetite suppressive alternative medicine for the obesity related disorders.

S7-6

Effects of obesity surgery on the metabolic syndrome

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Background: Individuals with the metabolic syndrome (MS), a clustering of risk factors [triglycerides, glucose, high-density lipoprotein cholesterol, blood pressure (BP), abdominal obesity defined by the Third Report of the National Cholesterol Education Program Expert Panel of Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (ATPIII)], are at high risk of coronary heart disease and type 2 diabetes mellitus, and may benefit from surgically-induced weight loss.

Methods: From December, 1999 to March 2002, we enrolled 645 consecutive morbid obese patients in a surgically supervised weight loss program and examine the efficacy of weight loss one year after surgery. This was a prospectively controlled clinical trial of the outcome of laparoscopic bariatric surgery. The prospectively collected data was retrospective analysis. Prevalence of the metabolic syndrome as defined by ATP III (>3 of the following abnormalities): waist circumference greater than 102 cm in men and 88 cm in women; serum triglycerides level of at least 150 mg/dl; high-density lipoprotein cholesterol (HDL-C) level of less than 40 mg/dl and 50 mg/dl in women; blood pressure of at least 130/85 mmHg; or serum glucose level of at least 110mg/dl.

Results: Out of 645 individuals, 337 (52.2%) met the ATPIII definition of the MS. Individuals with the MS had significant difference in age (31.5 vs. 28.1), male gender (37.7% vs. 26.3%) and many metabolic abnormalities compared with patients without MS. A significant decrease in weight (31.9%) resulted in substantial reduction of systolic (11.1 mmHg) and diastolic (11.4mmHg) blood pressure (BP), glucose (46.1mg/dl), triglyceride (196.6mg/dl) and total cholesterol (33.8mg/dl) one year after surgery. These improvements resulted in a 95.6% resolution of MS.

Conclusions: The MS is prevalence in 52.2% of morbid obese individuals enrolling in an obesity surgery program. Significant weight reduction one year after surgery markedly improved all aspects of the MS and resulted in a cure rate of 95.6%. Obesity surgery performed by laparoscopic surgery is recommended for obese patients complicated with MS.

S8-1

Developing new dietary approaches to weight management

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There is an urgent need to develop new dietary approaches to weight management (DAWMs) in two ways: weight control (obesity prevention) and sustained weight reduction (treatment). Current dietary approaches to weight management are remarkably rudimentary. Fat reduction strategies have become the established paradigm for prevention and treatment. However, there is little evidence that this approach induces a large negative effect on energy balance and body weight in the general population. Furthermore there are a large number of dietary approaches to weight loss available. Despite there being a large number of DAWMs available the majority of people cannot control or sustain weight loss. We need to go beyond fat reduction strategies and develop second generation DAWMs that will provide the consumer with a greater choice of solutions to the problem of weight control. We need to increase our understanding in three key areas: (i) the deterministic features of susceptibility to diet induced obesity. We need to understand how diet and phenotype interact to determine susceptibility to diet induced obesity. It is important to understand the psychological, behavioural, metabolic and genetic markers of susceptibility and resistance to weight gain. This knowledge will facilitate targeting of dietary approaches to specific vulnerable groups. (ii) The effect of current dietary approaches to weight loss on body composition, psychological and physiological function, feeding behaviour and subsequent weight regain. There are currently few structured longitudinal comparisons of the impact of current DAWMs on key indicators of health, well-being and quality of life. These are the factors that will heavily influence compliance and hence success at weight control. This information will provide mechanistic insights to fuel the development of new DAWMs. (iii) We need to develop comprehensive analyses of the mechanistic strengths & limitations of novel DAWMs. It is necessary to combine data on the mechanistic efficacy of DAWMs with information on the way diet and phenotype interact to influence weight control capability. It will be vital to better understand how different weight control methods impact on consumer acceptance and tolerability. We also need to determine the salient psychological and behavioural traits that determine success and failure at weight control and to appreciate consumer requirements for new DAWMs. It will then be possible to better tailor specific dietary approaches to the lifestyle and needs of the consumer. We need to avoid confusing consumers by building on, rather than replacing, the established paradigm of fat reduction. By gaining knowledge in these areas it will be possible to enhance mechanisms by which specific dietary constituents act to facilitate weight control. Integration of these insights with real-world modelling of the determinants of food intake in free-living people will facilitate development of advanced products, tools and advice tailored to meet the specific needs of different consumers.

S8-2

High protein intake supports weight maintenance after body weight loss in humans

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Aims: Investigation of addition of protein on weight-maintenance after weight loss of 5 to 10%.

Methods: In a randomized parallel trial in 148 subjects (age 44.2 ± 10.1 yrs; BMI 29.5 ± 2.5 kg/m²), with stratified characteristics a 4-week very low energy diet (2.1 MJ/d) was followed by 3 months' consumption of 25 g/d additional protein or not, while all subjects got dietary counselling. Protein intake was determined from 24h urinary nitrogen.

Results: Both groups lost 6.4 ± 1.8 kg body mass ($p < 0.001$). Thereafter the additional-protein group compared to the non-additional protein group showed 18 vs 15 en% protein intake, a 50% lower body weight regain (1.0 ± 0.2 vs 2.0 ± 0.3 kg) only consisting of fat free mass ($+2 \pm 0.2$ kg FFM- 1 ± 0.1 kg FM vs $+0.8 \pm 0.1$ kg FFM+ 2.2 ± 0.2 kg FM), a 50% decreased energy efficiency; increased satiety (8.4 ± 0.8 vs 0.5 ± 0.1 mm VAS), and a lower increase in triacylglycerol ($+160 \pm 74$ vs $+300 \pm 138$ μM/L) and in leptin ($+6.4 \pm 4.6$ vs $+9.5 \pm 6.1$ μg/L) ($p < 0.01$). Changes in RMR, RQ, TEE, glucose, insulin and free fatty acids did not differ.

Conclusion: A 18 vs 15 en% protein intake during weight-maintenance showed 50% less weight-regain, due to effects on body-composition, satiety and energy efficiency.

S8-3

Primary care management of obesity in Australian lower middle class patients

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Obesity could be considered as a psychosomatic disease as psychological triggers result in energy imbalance and consequently multi-organ dysfunction. Its treatment therefore should be aimed to reverse these psychological triggers as well as the complications of the disease. Pharmacological agents targeting fat metabolism have been proven to be very effective in treating obesity however their price seems to be prohibitive in this patient population. The aim of this study was to assess whether the interactive weight loss program (IWLP) comprising counselling, reduction of caloric intake and increase in physical activity resulted in maintenance of lost weight and reversal of complications of obesity.

Obese patients presenting for usual consultation were offered treatment by IWLP. Dietary habits, physical activity were assessed by daily dietary diary, and pedometer recorded steps, respectively. Progress was monitored by anthropometric measurements and serum biochemistry. Of 119 adults 70 consented to the IWLP, of whom 17 were actively treated (IWLP), 9 on maintenance program (MP), 44 dropped out. Patients adhering to the program (37%) achieved significant weight loss, reduction of blood pressure, biochemical markers and increase in physical activity.

IWLP has been found to be effective in reversal of obesity and its complications. Factors (relating to patients and method, respectively) causing the low retention rate of the IWLP need further assessment.

S8-4

Weight maintenance in post-weight reduction program: assessing its impact on quality of life

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The objective of this study is to evaluate the maintenance of weight after completing a 12-week weight reduction program and to assess its impact on health related quality of life of respondents. This study also monitors the compliance of respondents in continuing their dietary regiment and physical activities during a follow-up period. This is also a repeated measure design study to identify the changes in body weight of respondents through three levels of time (pre, post and follow-up periods). The respondents were assigned into 4 groups using quasi-experimental approach, which fulfilled the following criteria: BMI > 28.0 kg/m², adults and volunteers. The basic intervention consisted of downsizing of their daily meal consumption and snacking, behavior modification, physical activities (aerobic exercise and walking), and dietary counseling. All the four groups (N=60) underwent a basic intervention for 12 weeks with each group having to perform a different minor task as follows: Group 1: Package I (Basic Intervention + Music Therapy), Group 2: Package II (Basic Intervention + Record Keeping), Group 3: Package III (Basic Intervention + Music Therapy + 'Dumb Bell' Exercise + Record Keeping), Group 4: Package IV (Basic Intervention + 'Dumb Bell' Exercise + Record Keeping). The above packages were not conducted concurrently but were carried out during different time periods and the data collection took approximately two years. Participants were divided into several sub-groups to enhance motivation and interaction amongst them to achieve their weekly target weights, those who failed to achieve their target weight have to pay a fine. They were expected to reduce a minimum 1 kg per week or 1% of their original weight and record their food intake in food diaries for 12 weeks. Quality of life of participants was assessed using the SF-36 questionnaire, which consisted of eight domains. The quality of life components were divided into two components; physical and mental component. The results showed that there was a significant difference of means (p < 0.05) for anthropometric variables and quality of life scores within subjects. However, there was no significant difference between subjects for quality of life parameters. This study concluded that there was an improvement in quality of life among respondents after their weight loss. Generally, weight was maintained during the follow-up period through compliance of nutritional intake and physical activity.

S8-5

Effects of training programs on the management of obesity in an Iranian population

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Objectives: This study was conducted to examine the effectiveness of training programs, introducing Wisdom Domination Strategy, delivered by the staff of Arian Pooya Research Institute to obese patients.

Method: 400 female subjects attending Arian Pooya Obesity Research Institute were chosen and divided into two groups of 200 patients. Low Calorie Diet (LCD) was prescribed to both groups while the second group entered a 12-week behavioral treatment program, addressed as Wisdom Domination Strategy. The two hundred patients of the second groups were divided in subgroups of 30 patients. The patients were given a better idea of nutritional, physiological, psychological and eating behavioral factors all causing obesity.

Results: Upon the 12th week of treatment, the second group: (i) showed 38% weight loss more than the first group, (ii) were 47.3% more ready to continue the treatment, and (iii) about 41% were able to modify the whole family's eating behaviors.

Conclusions: Training programs during the treatment period had positive effects on the weight management of the patients. This study once again suggests the necessity of providing the patients with training programs as the 200 subjects entering the behavioral treatment program had a considerable success at weight loss compared to those who did not attend the program.

S8-6

Good glycaemic control through diet and structured exercise in obese type 2 diabetic patients in Kelantan

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A non-randomised control trial was conducted with the aim to assess the impact of structured healthy life-style program among Type 2 diabetic patients in Kelantan. One hundred and forty Type 2 diabetic patients from Selising Health Centre (intervention group) and Gaal Health Centre (control group) in Pasir Puteh District were selected using multistage sampling technique. An intervention group was given a structured and intensive health education on self-care, dietary advice and exercise. The control group was given conventional health education. Data were collected using a structured questionnaire, anthropometrics measurement and blood sampling for random blood sugar, HbA1c and serum creatinine. Statistical Package for Social Science (SPSS) version 9.0 was used for analysing the data. The patients in both health centres had a similar sociodemographic distribution (p value > 0.05). All of them are Malay, majority females (59% intervention, 66% control), married (74% intervention, 86% control), and a non-smoker (66% intervention, 73% control). Their mean (\pm SD) age was 55.4 ± 10.29 year (intervention) vs 54.5 ± 11.86 year (control) and median duration of diabetes was 4.5 year in both the intervention and control group. The intervention group showed a significant improvement of diabetes control as shown by HbA1c level before and after intervention program ($10.3 \pm 2.95\%$ vs $8.9 \pm 1.93\%$) whereas no significant improvement seen in the control group. There is also a significant improvement of body mass index (BMI) in the intervention group ($26.2 \pm 4.27 \text{ kgm}^{-2}$ vs $25.8 \pm 4.02 \text{ kgm}^{-2}$) whereas no significant improvement seen in the control group. The study showed that the blood glucose control and BMI of Type 2 diabetic patients could be improved if they are willing to change their lifestyle. The main challenge in management of these patients is however to sustained their healthy lifestyle.

S9-1

The coexistence of hunger and obesity among native migrant children in Mexico

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Low socioeconomic status and limited food availability during pregnancy and in the early years of life have been associated to childhood obesity. Indian migrants from the center and southern part of Mexico to the northern states or to the United States usually live in precarious conditions during the first few years after migration. However, the nutritional status and food security among the children of native migrant children in Mexico has not been reported. The purpose of this study was to assess the prevalence of overweight, obesity, undernutrition and hunger among migrant children in a city on the US Mexico border. During the 2001-2002, a total 1767 of children from six schools from the Tijuana Indian school system was measured to assess anthropometric status. Third and fifth grade children were also interviewed for their perception of hunger experience and dietary intake by 24-hour recall method. The overall prevalence of obesity was 39%. Abdominal obesity was found in 26% of subjects, while 43% had both obesity and abdominal obesity. The prevalence of undernutrition according to weight-for-age was 1.2%, and by height-for-age it was 4.8%. The prevalence of hunger was 2.5%, and at risk of hunger was 44%. Daily intake of food groups in servings was: 8.7 grains, 1.2 fruit, 1.0 vegetable, 2.1 milk and 2.6 meat. Only one child (0.07%) consumed The Apple of Health recommended portions. This study confirmed the coexistence of obesity, hunger, undernutrition and limited food group consumption among Indian children living in a prosperous and the largest US-Mexico border city.

S9-2

Obesity in Saudi Arabia

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It is well documented that obesity is associated with several chronic illnesses. Therefore, the prevalence of obesity in a population can be considered as a rough indicator for health status. Obesity is not an uncommon finding, particularly in affluent societies. In Saudi Arabia, obesity is becoming one of the most important public health problems. The prevalence of obesity in Saudi Arabia ranges from 9.5% to about 83%. This wide variation could be due to the differences in criteria used to define obesity and also to the differences in age, sex, and health status. The available data clearly indicate a high prevalence of adult obesity particularly in women in the Kingdom.

This paper aims to briefly summarize the current state of knowledge about the prevalence of obesity, its predisposing factors, and its management in Saudi Arabia. This information is required for planning intervention programmes in nutrition and to offer new directions for improving the health of the people of Saudi Arabia.

Body mass index, waist circumference and health status of rural elderly Malays in four rural areas of Malaysia

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The distribution of body mass index (BMI) and waist circumference with age and their relationships with health variables included high blood pressure risk, dyslipidaemia and functional status were investigated among 820 non-institutionalised elderly Malays from four rural areas of Malaysia; i.e. Kuala Pilah, Negeri Sembilan; Sabak Bernam, Selangor; Pasir Mas, Kelantan and Kodiang, Kedah. Subjects consisted of 433 men (52.8%) and 387 women (47.2%), with age ranged from 60 to 97 years and mean (SD) of 69.0 ± 6.75 . Nearly 80% of the subjects aged between 60 – 74 years old. Most of the subjects were married (68.4%), followed by widowed/widower (30.1%), divorced (1%) and unmarried (0.5%). One third (32.6%) reported still working such as farmers, rubber tappers, groceries seller and security guard. Whilst, 30.2% were not working, 20.2% were housewives and 8.3% were pensioners. The mean Body Mass Index (BMI) of the subjects of $22.0 \pm 6.5 \text{ kg/m}^2$ was within the normal range. Although the majority of the subjects had normal BMIs, a proportion of subjects have been classified as overweight (BMI 25 to 29.9 kg/m^2) (22.7%) and having chronic energy deficiency (BMI $< 18.5 \text{ kg/m}^2$) (23.7%). Analysis of lipid status among a subsample in Kuala Pilah, Sabak Bernam and Pasir Mas indicated that the prevalence of hypercholesterolemia ($> 5.7 \text{ mmol/l}$), hypertriglyceridemia ($> 1.4 \text{ mmol/l}$) and high LDL values ($> 3.8 \text{ mmol/l}$) were 53.1%, 34.9% and 52.1%. BMI correlated with negatively with age ($r = -0.273$, $p < 0.0001$) and HDL ($r = -0.290$, $p < 0.0001$), and associated positively with waist circumference ($r = 0.819$, $p < 0.0001$), waist-hip ratio ($r = 0.384$, $p < 0.0001$), handgrip strength ($r = 0.110$, $p < 0.005$), instrumental activities of daily living (IADL) ($r = 0.158$, $p < 0.001$), systolic BP ($r = 0.196$, $p < 0.0001$), diastolic BP ($r = 0.253$, $p < 0.0001$), fasting blood sugar (FBS) ($r = 0.253$, $p < 0.0001$), total cholesterol (TC) ($r = 0.157$, $p < 0.005$), triglycerides ($r = 0.260$, $p < 0.0001$) and LDL ($r = 0.158$, $p < 0.05$). Waist circumference and waist hip ratio also showed similar trend of associations. Analysis of multiple regression indicated that the major predictors of BMI were waist circumference, waist hip ratio, LDL, HDL, and handgrip strength ($R^2 = 0.830$, $p < 0.0001$). Whilst, the significant predictors for waist circumference were waist-hip ratio, triglycerides, age, systolic BP and FBS ($R^2 = 0.681$, $p < 0.0001$). The major predictors of waist hip ratio were HDL, triglycerides and handgrip strength ($R^2 = 0.301$, $p < 0.0001$). The distribution of BMI and waist circumference according to hypertension risk, high FBS, high TC, high LDL and high HDL were also examined. In conclusion, among rural elderly Malays, BMI and waist circumference were associated with health variables included functional status, dyslipidaemia and hypertension risk.

Overweight and obesity among Malaysian adolescents

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The prevalence of obesity in Malaysia is on the rise, not only among its adult population but also amongst children and adolescents. This paper aims to report the prevalence of overweight and obesity among Malaysian adolescents aged 12 – 18 years from a dataset collected in a cross-sectional study on energy metabolism carried out between September 2000 and June 2003. Subjects comprised 2542 boys and 2752 girls of Malay, Chinese, Indian and Sarawak native ethnicities from twelve secondary schools in rural and urban areas of various regions in Malaysia. Body weight and height were measured in school uniform and without shoes; using Tanita digital scale to the nearest 0.2kg and SECA bodymeter 208 to the nearest 0.1cm, respectively. Body mass index (BMI) was calculated and compared with age and sex-specific BMI-for-age cut-off values for overweight and obesity as recommended by Cole et al. (2000). Prevalence of overweight and obesity was 13.7% and 6.6% for boys, and 12.9% and 4.8% for girls, respectively. In urban areas, prevalence of overweight and obesity is nearly 5% higher than in rural areas. Comparison between ethnic groups showed very similar prevalence of overweight and obesity: Chinese 19.5%, Sarawak natives 19.3%, Malays 18.7% and Indians 18.4%. However, when observed separately for each sex, it is interesting to note that prevalence of overweight and obesity is highest among Chinese boys 23.9% and lowest among Indian boys 17.5% (Malays 19.2%, Sarawak natives 19.8%). However, in girls, the Chinese recorded the lowest prevalence 15.4% while Indians recorded the highest 19.4% (Malays 18.2%, Sarawak natives 19.0%). Although prevalence may differ between sex and ethnic groups, the overall results of this study showed that approximately one in five Malaysian adolescents are overweight or obese.

S9-5

Height weight difference index (HWDI) for screening overweight and obesity in adults

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Body mass index (BMI) is the favourite index for assessing nutritional status in adults. However, it needs a means, such as a calculator or nomogram for obtaining BMI from weight and height. It may be difficult to determine individual BMI without one means or another of performing the calculation. The objective of this study was to evaluate the use of height weight difference index (HWDI) for screening overweight and obesity in adults. There were 2,234 Thai subjects (including males and females), aged between 20 and 35 years, enrolled in a community cohort project, Chiang Mai province, Thailand. Height and weight were measured. BMI was calculated from weight and height (kg/m^2) and the BMI classified as proposed by WHO (1995). HWDI was calculated using the formula: height (cm) – weight (kg). There was a negative correlation between BMI and HWDI ($r = -0.97$, $P < 0.001$, $n = 2,234$) with linear regression equation: $\text{HWDI} = 158.69 - 2.54 * \text{BMI}$ ($P < 0.001$). From the equation, the figures of HWDI for predicting underweight, normal weight, overweight and obesity were calculated. Nutritional status of the subjects assessed by HWDI was compared with those assessed by BMI. Then the percentage of sensitivity and specificity were calculated. The kappa statistic was used to measure agreement between the assessment of nutritional status by HWDI and by BMI. It may be inferred that HWDI might not be suitable index for screening thin adults from those who have normal nutritional status. However, the study findings suggest that HWDI could be used as a simple and effective index for screening overweight and obesity in adults.

S9-6

Overweight and obesity among pre-school aged Filipino children

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Objectives. This study aims to illustrate BMI curve of healthy pre-school aged Filipino children from middle class families, to compare it with the IOTF standards, and to identify factors related to overweight and obesity in this population.

Methodology. After informed consent, 228 healthy children from Metro Manila aged 18 to 80 months were included. The following data were collected either by questionnaire distribution or phone interview of the parents: age, sex, birth order, number of siblings, family history of obesity, diabetes mellitus and hypertension, history of chronic illness, maternal gestational problem and neonatal illness, nutritional history, and caretaker inquiry. BMI ($\text{weight (kg)} / \text{height (m)}^2$) at birth and ponderal Index ($\text{weight(kg)} / \text{height(m)}^3$) were computed based on hospital or clinic record of birth weight and length. Children were classified as obese, overweight or non-obese based on IOTF BMI standards or the NCHS weight-for-height standards in children less than 2 years old.

Results. The BMI curve of pre-school aged Filipino children exhibits the characteristic dip and adiposity rebound observed in the IOTF and other international BMI standards. The prevalence of overweight and obese in this group was 19.00% and 11.31%, respectively, much higher than the estimated overall prevalence of overweight in the country (0.8% – 1.0%). Access to western food, modern technology and privatized health care may explain this increased prevalence of overweight among urbanized children of average-income families. A family history of Type 2 Diabetes Mellitus was associated with overweight and obesity ($p=0.007205$); all other factors reviewed were not significantly correlated. Obese and overweight boys have slightly greater birth weight, BMI at birth and ponderal index than the non-obese. Conversely, obese and overweight girls have slightly lower birth weight, BMI at birth and ponderal index compared to their non-obese counterparts. These differences in birth measurements reflective of intrauterine nutrition, however, were not statistically significant.

The medical cost of obesity in Taiwan area

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Obesity, defined as excess of body fat that induced health hazard, is a widespread and growing problem in the world with significant medical, psychosocial and economic consequences. Obesity has been demonstrated as an independent risk factor for type 2 diabetes, gall bladder disease, coronary heart disease and certain cancers. The risk of these co-morbidities in obese population is increased about 2 to 3 folds than the general population. Obesity has emerged as a complex clinical entity such as glucose intolerance, gall bladder disease, dyslipidemia, and other cardiovascular disorders.

The prevalence of obesity has increased substantially over the last few decades and this trend will continue not only in developed but also in developing countries. In Taiwan, the prevalence of obesity and overweight increased significantly from 25% to 45% and became an important health issue in recently 20 years.

The total cost of obesity can be divided into direct (such as disease cost, health care system cost and pharmaceutical cost), indirect cost (such as decrease of productivity and reduction of GNP) and intangible cost (such as social and personal loss). The medical cost (include out-patient and in-patient services and surgical procedures) for obese patients is positively associated with their body mass index, adverse lifestyles and co-morbidities. However, counting of the medical cost of obesity is difficult and complicated in origin.

Given the elevated and increase prevalence of obesity in Taiwan area which is associated with increased rates of health services utilization and total cost. Maintenance of body weight and prevention of obesity in the early life may be the best way to reduce the obesity-related health care expenditures.

The effect of physical education on fat distribution and aerobic endurance in female Filipino adolescents

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The purpose of this study was to assess the relationship between central fat distribution indices, aerobic endurance, and a semester-long physical education program in adolescent Filipino females. Subjects were 122 girls (18.1±1.4 years, 156.2±6.4 cm, 49.1±8.0 kg) from a state university in Metro Manila, Philippines, who were engaged in physical education (PE) activities as part of their study program. In addition to age, height and weight, waist-hip ratio (WHR), conicity (C) and VO₂ peak (derived from 1-mile run/walk performance using a regression equation) were measured. PE classes were twice a week for a total of 2 hours. The pre-test was conducted at the beginning of the semester, while the post-test was done at the end. A repeated measures MANOVA was used to determine the differences in fat distribution and VO₂ peak before and after the intervention. Simple regression was employed to examine the relationship between WHR and C. Log transforms were used for statistical analysis. There was no difference in WHR (0.74±0.08 cm versus 0.74±0.12 cm, $\eta^2 = 0.001$) and VO₂ peak (49.10±2.89 ml.kg⁻¹.min⁻¹ vs. 49.45±3.01 ml.kg⁻¹.min⁻¹, $\eta^2 = 0.015$) over time. However, C increased from pre- (1.17±0.06) to post-test (1.19±0.12) ($\eta^2 = 0.062$, $p = 0.006$). At the end of the semester, C accounted for a large part of the variance in WHR ($R^2 = 0.890$, SEE = 0.034, $p < 0.001$). The girls recorded a lower WHR than their counterparts from a private university in the Philippines, but a higher VO₂ peak. However, the PE program was not sufficient in duration, intensity and frequency to elicit an aerobic effect. It is worrisome that the conicity index increased over time. In conclusion, the current PE program does not cater to health-related physical fitness and central fat concerns in relation to the onset of cardiovascular diseases later in life.

S10-3

Body image perception: are overweight and obese rural adolescents different from their urban counterparts?

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The perceptions of body image among overweight and obese adolescents in the rural were compared with their urban counterpart. A total of 854 rural and 164 urban adolescents aged between 12 to 15 years from southern Peninsula Malaysia participated in the study. Weight and height were measured and body mass index (BMI) were calculated. A validated body image questionnaire was used to determine body image perception among subjects. Body distortion was evaluated by the difference between subjects' actual BMI category and their perception. Modified Stunkard's figure rating was used to determine the difference between the ideal and actual body shape. In the rural, one in three overweight boys have body distortion, while this occurred in one out of two boys in the urban. Among the girls, one in five overweight girls have body distortion in the rural area, in contrast to one in two overweight girls in the urban. These results suggested that generally distortion of body image was present in both boys and girls in the urban and rural area, however the distortion appeared to be worse in the urban adolescents. In the rural, the ideal figure for all weight categories among boys was quite similar. The ideal figure for overweight boys was significantly bigger in the urban. However, among girls either from rural or urban area, the ideal figure was biggest in the overweight group. Overall, based on the body image inventory, both rural and urban overweight adolescent boys and girls demonstrated similar negative feelings about their body weight satisfaction, weight increase and preoccupation towards their weight. This study showed that both rural and urban overweight adolescents were more dissatisfied with their body image compared with their underweight and normal weight counterparts, however the dissatisfaction was worse in the urban especially among girls. A body image education package is now being implemented to overcome the problems.

S10-4

Obesity among Iranian women: role of social factors

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The proportion of Iranian women who are overweight is increasing. Social context in Iran is very different from western countries and Islamic rules are reflected in many social aspects of life in Iran and they might interact with obesity related behaviours in the population. There are some data to suggest that what Iranian women think about ideal body weight is different from western countries. There is less social pressure for conforming to an ideal body weight in Iran. Women's dressing style in public and lack of media images for conforming to an ideal body weight may have made Iranian women less concerned with dieting and thinness. Also, Iranian women less engage in sport and out door leisure activities due to religious reasons and cosmetic and body shape related fashionable advertisements and media images have also been banned since the Islamic revolution in 1979. On the other hand, in Iranian women, as the women in the developed countries, the level of education was negatively related to BMI. These data implicate that the association between BMI and the level of education could be independent of social pressure to the norm of thinness, and other factors such as women's health knowledge might have an important role.

S10-5

BMI and physical activity are associated with serum uric acid levels in young adults

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Increased blood uric acid levels results in the formation of urate crystals, which may lead to gout, a chronic disease frequently observed in affluent societies. A study was carried out to determine the relationship between body mass index and physical activity patterns with serum uric acid levels in young adults. One hundred and two, 18-25 years old Universiti Putra Malaysia students volunteered to participate in this study. Among them 50(49%) were females and 52(51%) were males. Ethnic distribution was 36 Malays (35.3%), 33 Chinese (32.4%), and 33 Indians (32.4%). Body mass index was determined and was categorised using the WHO (1995) classification. Information on physical activity pattern was obtained through a structured questionnaire. Two millilitres of venous blood was taken from each of the respondents and tested for their serum uric acid level using the Johnson & Johnson DT 60 II Analyzer. Obesity prevalence was 3.9 % while overweight accounted for 16.7% in this population group. More females (50%) than male students (38.5%) exercised more than twice a week on a regular basis. One-sample Kolmogorov Smirnov test verified the normality of the serum uric acid level distribution. There was a significant difference ($p < 0.05$) in serum uric acid levels between male and female students but not among ethnic groups. Only males showed hyperuricemic values, (9.80% of respondents) and 2 females showed hypouricemic values (1.96% of respondents). Serum uric acid levels were found to be significantly correlated ($r = 0.334$, $P < 0.01$) to the BMI of subjects. There was also a significant negative correlation with physical activity level ($r = -0.336$, $p < 0.01$). Young adults need to be educated on the importance of physical activity for the prevention of chronic health problems.

S10-6

Fast food as a risk factor for obesity in Indonesian school children

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Background: Obesity in Indonesian elementary school children has been increasing very dramatically during the last ten years. It occurs concurrently with the increased consumption of fast food among school children. Whether fast food consumption is a risk factor for obesity in school children is unknown.

Objectives : The study was conducted to examine the potential role of high fast food consumption as a risk factor for obesity in Indonesian school children.

Method : A case-control study was conducted to examine the role of fast food consumption as a risk factor of obesity. Cases were school children aged 6-12 years, who had Weight for Height Z-Score (WHZ) $\geq +2SD$ living in Denpasar city, while controls were children aged 6-12 years who had WHZ $< +2SD$ living in the same place of cases. Controls were age-and sex-matched with cases. Sixty nine cases and 69 controls were included in the study. Weight of each child was measured using Detecto medic scale while height was measured using Microtoise. Food frequency questionnaires were used to collect information on child fast food consumption during the last 3 months.

Results: This study showed that the obesity prevalence among elementary school children of Denpasar city was high enough (13.6%). The prevalence of obesity was higher in private schools (18.2%) than in state schools (12.4%). The more various fast foods were consumed the higher risk of obesity (OR=6.5, 95% CI=1,4 - 30,7). Children with $\geq 75\%$ of the total energy intake per-day from fast food were 12 times more likely (OR=12.3, 95% CI= 5,5 -27,7) to be obese than children with $< 75\%$ of the total energy from fast food.

Conclusions: The higher contribution of fast food to total energy intake per-day the higher risk of obesity of school children.

PHILIP KORN

LIST OF POSTERS

List of Posters

- P-1** A study on physical activity pattern among normal and overweight primary school children in Subang Jaya
Sin YW, Tan SY, Ismail MN
- P-2** Nutritional status and quality of life of women in fishing villages and urban housing area in Kelantan, Malaysia
Ruhaya Hasan, Wan A Manan, Abdul Manaf Hamid
- P-3** Alterations in percentage body fat predicted from anthropometric measurements through 12 weeks weight management program
Rohana AJ, Wan A Manan, Wan Mohamad B, Ruhani, H, Ooi GS, Rubiah O
- P-4** Development and validation of a prediction equation for body fat percent based on skinfolds for Singaporean adults and adolescents
Deurenberg-Yap M, Ng SA, Foo LL, Deurenberg P
- P-5** Anthropometric measurements and activity patterns of men involved in sports, exercise and sedentary activities
Wan Nudri WD, Wan Abdul Manan WM, Mohamed Rusli A, Mohd Rafi M, Shahrin Nizam A
- P-6** Precise and low price caliper: Design and evaluation of validity and reliability
Meamarbashi Abbas, Siahkohian Marefat, Arian-Nezhad Javad
- P-7** BMI status of adolescents: A comparison between regions in Malaysia
Onq Huey Fen, Poh Bee Koon, Norimah A Karim, Mohd Ismail Noor
- P-8** Overweight and underweight coexist among Iranian preschool children
Mohtasham Amiri Z, Maddah M, Jafari Shakib A
- P-9** Overweight and obesity among future physicians
Mohtasham Amiri Z, Maddah M, Jafari Shakib A
- P-10** Association of body mass index with educational level in Iranian men and women
Maddah M, Eshraghian MR, Djazayery A, Mirdamadi R
- P-11** Fatness and obesity among Omani University students
Masoud Y Al-Maskari, Nazar Ashraf, Nasser Al-Kemyani, Saif Al-Zaabi, Mustafa Al-Hinai
- P-12** Prevalence of overweight among 7-9 year old Indian school children
Ahuja S, Wadhwa A, Chaddha R
- P-13** Obesity and dietary habits of Chinese school children in Kota Bharu, Kelantan, Malaysia
Soo Kah Leng, Wan A Manan, Abdul Manaf Hamid

- P-14 Prevalence of obesity among schoolchildren (11-12 years old) in rural district of Hulu Terengganu**
Hayati MY, Hayati Adilin MAM
- P-15 Overweight and at-risk waist circumference are associated with household food insecurity among a sample of Malaysian rural women**
Zalilah A
- P-16 Assessment of anthropometric measurements and life style practices among the Aborigines (adult) in Lembah Belum, Perak**
Hayati MY, Ting SC
- P-17 Prevalence of obesity, dietary intake and physical activity among secondary school students**
Zaitun Y, Pun HF
- P-18 Prevalence of obesity and other cardiovascular disease (CVD) risk factors in type 2 diabetic subjects**
Hazizi AS, Zaitun Y, Kandiah M, Chan SP
- P-19 Relationship between weight, body composition, body fat distribution and bone mineral density in postmenopausal Malay women**
Rani S, Zaitun Y, Suriah AR, Mirnalini K, Chee SS, Chan SP, Rokiah P, Chan YM
- P-20 Body fat and body image among adolescents in Singapore**
Foo LL, Deurenberg P, Ng SA, Deurenberg-Yap M
- P-21 The study of the psychological disorders in the obese patients of a diet clinic in Mashad**
Mohammad R Sargolzaee, Arian Nejad-Javad, Aliakbar Samari, Hassan Ebadi
- P-22 The study of body mass index (BMI) and nutritional diet in the patients who request cosmetic rhinoplasty**
Nastaran Eyvazi, Shapoor Karimi, Mohammad Reza Sargolzaee
- P-23 Sweetness acceptance of cocoa flavoured milk among overweight and normal weight UKM students**
Zalifah MK, Tham CC
- P-24 Weight changes among participants attending weight management camp in Kuala Lumpur**
Norimah AK, Rohana Ya'akof, Nik Shanita S
- P-25 Insulin resistance and ferritin as major determinants of nonalcoholic fatty liver disease in apparently healthy obese patients**
Tun-Jen Hsiao, Juei-Chan Chen, Jung-Der Wang
- P-26 Obesity in Asia: A learning module for health professionals**
Wan A Manan, Zulkifli Ahmad, Do Trieu Hung, Suntaree Ratanachu-ek, Mantian Mi, Bing Sun

- P-27 Laparoscopic vertical banded gastroplasty versus laparoscopic gastric bypass: A randomized trial for treatment of morbid obesity**
Wei-Jei Lee, Ming-Te Huang, Po-Jui Yu, Weu Wang
- P-28 Habitual caffeine intake affects weight-loss and affects the effect of green tea on weight-maintenance thereafter**
Westerterp-Plantenga M, Lejeune M, Kovacs E
- P-29 Obesity management through psychologic personality studied by Szondi's test**
Jean-Paul Ory, Anne-Marie Vergnory
- P-30 Effective weight management and weight-gain prevention communications for pre-teens - identifying how, what and where?**
Cairns GA, Borra ST
- P-31 "Whiz kids through fitness": A PASOO project**
Florentino RF, Orbeta SS, Sy RA
- P-32 Nutrition management of post lap band surgery patient: A case study**
Foong Pui Hing
- P-33 Effects of an internet-based exercise program on physiological changes in adult overweight females: A pilot study**
Wong Sook Kwan, Rabindarjeet Singh, Roland G Sirisinghe, Mohd Nawawi Yasin
- P-34 Amino acid conjugated small molecules in insulin resistant obese-diabetic animal models**
Deben Dey, Abhijeet Nag, Bindu Pandey, Sreekanth Gutala, Hyang Moon, Bishwajit Nag
- P-35 Child and adult obesity control: The growth monitoring and promotion approach**
Offor EA, Atinmo T
- P-36 Pathogenesis and pathophysiology of ventromedial hypothalamic lesioned rats**
Shuji Inoue
- P-37 Nutritional profile of Indian adolescent girls: Relationship with self concept**
Renu Gulati, Khanna
- P-38 Effectiveness of physical activities on body weight reduction and its relation to dietary intake among women attending an aerobic center**
Rokiah MY, Siti Shuhailah SAR
- P-39 Glycemic index of some commonly consumed Malaysian foods determined in obese individuals**
Nik Shanita S, Ismail MN

ABSTRACTS FOR POSTER SESSION

P-1

A study on physical activity pattern among normal and overweight primary school children in Subang Jaya

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The objective of this study was to assess the physical activity pattern among primary school children in Subang Jaya. 125 boys and 118 girls (n=243) aged 10-12 years old participated in this study. Two groups of subjects were involved where the normal weight group (n=120) was determined by using standard classification of World Health Organization (WHO) 1995 and the overweight group (n=123) was determined by using standard classification of Cole et al. (2000). Physical activity pattern between normal weight and overweight groups were compared using three-day activity record method. This study had found that subjects spent most of the time on light activity (83-85%), followed by moderate activity (11-13%) and heavy activity (3-5%). During weekend, subjects spent more time on lying and sleeping, watching television (TV) and shopping ($p < 0.01$: boys; $p < 0.05$: girls) compared to weekday. However, time for learn/tuition was less than weekday ($p < 0.01$: boys; $p < 0.05$: girls). Overweight subject had spent more time on indoor activity (watching TV and playing computer games) during leisure time ($p < 0.01$) while normal weight subject spent more time on outdoor activity (run and games) ($p < 0.01$). This study indicated significant relationship between watching TV with BMI ($r = 0.238$, $p < 0.01$) and % body fat ($r = 0.473$, $p < 0.01$) subject, and also between playing computer games with BMI ($r = 0.369$, $p < 0.01$) and % body fat ($r = 0.242$, $p < 0.01$) subject. There had significant inverse relationship between vigorous activity with BMI ($r = -0.468$, $p < 0.01$) and % body fat ($r = -0.632$, $p < 0.01$) subject. This concluded that the more active lifestyle in children, the lower BMI and % body fat they had. There also had significant relationship between household income with watching TV ($r = 0.139$, $p < 0.05$), while had significant inverse relationship between vigorous activity ($r = -0.137$, $p < 0.05$). Level of father education also had inverse relationship with vigorous activity ($r = -0.169$, $p < 0.01$), but there was no relationship between level of mother education with vigorous activity. Therefore, the higher household income and level of father education may lead to the more non-active lifestyle in children.

Nutritional status and quality of life of women in fishing villages and urban housing area in Kelantan, Malaysia

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Quality of life and nutritional status are now important measures for health and fitness. The purpose of this study is to determine the nutritional status, to identify selected indicators of quality of life, to establish the relationship between environmental factors and selected indicators of quality of life, and to compare the findings between two sampled populations in different localities. This is a cross-sectional comparative study in which 80 respondents from Kg. Perupok and 80 respondents from Padang Tembak were chosen randomly. Criteria for selection is that they must be adult women aged 18 to 55 years who were head of household family, housewives or daughters within the same age group. Nutrient intakes were recorded using a 24-hour recall method. Respondents were required to answer a KAP nutrition questionnaire and sociodemographic information were also recorded. The SF-36 form was used to evaluate their health related quality of life. Anthropometric measurements that were recorded include weight, height, BMI, WHR ratio and percent of body fat. Results showed that 22.6% of respondents in Kg. Perupok (rural) and 18.8% Padang Tembak (urban) were obese, respectively. The overall quality of life of respondents in both locations was good since 6 out of 8 item of quality of life indicators showed a transformation score of more than 50%. Pearson correlation analysis indicated that educational level, household income, household spending and nutritional knowledge were significantly correlated with physical function indicators for respondents in Padang Tembak. On the other hand, age, BMI and general health correlated negatively with physical function indicators. However, energy intake and vitamin C were influenced by physical function for respondents in Kg. Perupok. On the contrary, body weight and BMI were influenced by nutrients intake. These variables also correlated significantly with household spending and physical activity for respondents at Kg. Perupok. Multiple regression analysis revealed that socio economy, nutritional knowledge and BMI were predictors for physical function of respondents in Padang Tembak. Age, education level, percent of body fat, energy intake and vitamin C were predictors for physical function of respondents in Kg. Perupok.

Alterations in percentage body fat predicted from anthropometric measurements through 12 weeks weight management program

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This study determined the magnitude of changes in body weight and body fat predicted from anthropometric measurements among 60 volunteered obese subjects who underwent 12 weeks of weight management program. A repeated measure design was developed to identify the changes in percentage of body fat predicted from anthropometric measurements through two level of times; baseline and post intervention. To qualify for the study, participants had to be overweight (BMI > 27.0 kg/m²) and above, more than 18 years old, free of pregnancy, no chronic medical problems and did not participate in other commercial weight reduction programs during the study period. All subjects received a package of intervention consisted lifestyle modification via exercise, nutrition education and behavioural changes. Participants were divided into several sub-groups in order to enhance their motivation and interaction towards achieving their weekly target weights. They were expected to reduce a minimum 1 kg per week and record their food intake in food diaries. Measurements were made before intervention (Week 0) and after completing intervention (Week 12). Percentage of body fat was predicted from the body mass index, waist circumference and four sites of skinfold thickness (bicep, triceps, subscapular & suprailiac). Percentage of fat predicted from the body mass index was calculated from the prediction equation proposed by Deurenberg *et al* (1991), whereas formula by Lean *et al* (1996) was used to predict percentage of fat from waist circumference. Classical prediction equation by Brozek *et al* (1963) was used to predict percentage body fat from four sites of skinfold thickness. Repeated measures analysis of variance was used to determine the interaction effects and differences within group (time-effect). Clearly, there is a significance difference ($p < 0.001$) for the percentage of body fat reduction predicted from anthropometric measurements at the end of the program. It can be concluded that a short-term intervention can induce favorable changes in percentage of body fat and increasing physical activity will likely provide a major contribution to the alteration of body fat.

Development and validation of a prediction equation for body fat percent based on skinfolds for Singaporean adults and adolescents

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The study sought to develop and validate prediction equations for body fat percent from skinfold thickness for use among Singaporeans. Data from 291 adults aged 18 to 67 years old and 477 adolescents aged 12 to 17 years were collected. Body fat percent in the adults was measured using a 4-compartment model whilst deuterium oxide dilution was used for the adolescents. Biceps, triceps, suprailiac and subscapular skinfold thicknesses were also measured. The adult sample was randomly divided into two groups. In one group, a prediction equation for body fat percent based on the sum of four skinfolds as developed using stepwise multiple regression analyses. Ethnicity did not enter into the model. Age did not enter into the regression equation in females though it made a slight but significant contribution to the prediction equation in males. The formulas were validated in the second adult group, total adult group and adolescent group. In adults, the prediction equations showed good cross-validity for the three ethnic groups (Chinese, Malays and Indians) and the bias was not age-dependent. However, in subjects with higher body fat percent, the formulas tend to underestimate body fat percent. The prediction equation based on the sum of four skinfolds was valid in female adolescents but slightly underestimated body fat percent in adolescent males. The bias was not different across the ethnic groups. It is concluded that the 'adult' prediction equations based on four skinfolds can be used to obtain a valid prediction of body fat percent in adolescents and adults of the three main ethnic groups in Singapore.

Antropometric measurements and activity patterns of men involved in sports, exercise and sedentary activities

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A cross-sectional study was conducted to compare the anthropometric measurements and activity patterns among three groups of men, aged 18 to 44 years, around Kota Bharu, Kelantan. The respondents studied comprised of 83 trained athletes representing various types of sports (athlete group), 80 active men who exercised a minimum of 30 minutes per day for at least 3 times per week (exercise group), and 80 inactive men (sedentary group). The body weight and height of respondents were measured using the SECA weighing balance with height attachment. Skinfold thickness of biceps, triceps, subscapular and suprailiac were measured using the Harpenden calipers. The percentage of body fat was calculated from the sum of 4 measurements of skinfold thickness. The daily activity pattern of respondents was recorded using the diary card. The results showed that the mean body mass index (BMI) among athlete, exercise, and sedentary groups were 22.6, 23.4, and 24.3 kg/m², respectively, while their mean percentage of body fat were 15.7, 18.9, and 20.6%, respectively. The prevalence of overweight (BMI \geq 25.0 kg/m²) among the athlete, exercise, and sedentary groups were 21.7%, 29.9% and 47.5%, respectively. A one-day activity pattern showed that the mean time spent in heavy activities such as sports and exercise activities was 124 minutes for athlete group, 67 minutes for exercise group and 3 minutes for sedentary group. The study revealed that the more active individuals have better nutritional status compared to sedentary people.

P-6

Precise and low price caliper: Design and evaluation of validity and reliability

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The most direct, simple, and accurate method for estimating leanness vs. fatness is measuring the thickness of skinfolds by constant-tension calipers. The "Pooya Skinfold Caliper" manufactured by pooya armaghan Co. (IRAN), was specifically designed for the simple and accurate measurement of subcutaneous fat tissue. "Pooya Skinfold caliper" has a spring, which provides a standard tip pressure of 10 g/mm² throughout the full measurement range. In design attention was focused on easy replacement of spring and to provide substantially constant standard pressure over the entire operation range. Replaceable spring solves the major problem of the traditional skinfold caliper that is reduction of the tension of the spring over due time. This equipment measures skinfold thickness up to 80 mm with 0.5 mm accuracy. Use a simple design, easy to use and read as the main characteristic of this calliper. It is made of ABS plastic for most durable, light and inexpensive for research and personal use. Pivoted tips adjust automatically for parallel measurement of skinfolds, and rectangular faces with well-rounded edges and corners to assure subject is in comfort. Validity and reliability of this caliper was evaluated by the Iran Sport Science Research Centre. In this study, 3 domestic callipers were assessed by Yagami Caliper (Japan) as the reference device. Two hundred students of Tehran University were assessed with four types of callipers. The middle of the triceps and calf muscle were assessed for estimation of the body fat percentage of the subjects. The percentage of body fat (BF%) was determined by any of the callipers through Slaughter equations (amended by Lohman). To analyse the reliability and validity of the obtained data, the variance analysis (paired t-test) and Cronbach Alpha methods were used. The data analysis showed that the reliability of "pooya" calliper is higher than other domestic callipers ($r=0.9983$) ($p<0.001$).

P-7

BMI status of adolescents: A comparison between regions in Malaysia

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This paper aims to discuss the body mass index (BMI) status of Malaysian adolescents aged 12 – 18 years from a dataset collected in a cross-sectional study on energy metabolism carried out from September 2000 until June 2003. The WHO (1995) sex and age-specific BMI reference is used to compare the prevalence of underweight and overweight in various regions of Malaysia. Underweight was categorised as BMI < 5th percentile, at risk of overweight as 85th ≤ BMI < 95th percentile, and overweight as BMI ≥ 95th percentile. Body weight and height were measured in school uniform and without shoes; using Tanita digital scale and SECA bodymeter 208, respectively. A total of 5294 students (2542 boys and 2752 girls) from twelve secondary schools in Peninsula Malaysia (Central, East Coast, Northern and Southern regions) and Sarawak (Miri district) took part in the study. The overall prevalence of underweight in Peninsula Malaysia was 9.0% (Central 9.5%, East Coast 7.1%, Northern 10.7% and Southern 8.7%), as compared to 4.9% in Sarawak. Prevalence of adolescents at risk of overweight was 11.2% in Peninsula Malaysia, with the highest rates at 12.9% in both central and northern regions; and lower rates at 9.6% and 9.3% in the East Coast and Southern regions, respectively) and 12.5% in Sarawak. Overweight prevalence was 7.7% in Peninsula Malaysia with the highest rate at 8.7% in the Northern region, and the lowest rate of 5.8% in Sarawak. The total proportion of adolescents being classified as overweight or at risk was similar in the Peninsula (18.8%) and Sarawak (18.3%). Overall, it was found that slightly more adolescents in Sarawak (76.8%) have normal BMI, as compared with 72.2% in Peninsula Malaysia (highest in East Coast at 76.7%; lowest in Central and Northern regions at 70.0%). The results of this study should be interpreted with caution, as larger nationwide representative database collected using proper sampling methodology is needed to support these findings.

Overweight and underweight coexist among Iranian preschool children

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As among many other Asian countries, Iran is in the phase of a rapid demographic, nutritional transition and dietary habits and lifestyles are changing. These have led to new health problem that childhood overweight and obesity is one such growing nutritional problem. The study aimed to establish the nutritional status of preschool children in Rasht, north of Iran. In a cross-sectional study, eight hundred fifty-two 4-6y old children were selected. Weight was measured to 0.1 kg and height was measured to 0.1 cm. Other information regarding behavior, feeding practices and socioeconomic factors were obtained through a questionnaire filled by parents. The prevalence of underweight (defined as weight-for-height $< 5^{\text{th}}$ percentile) in this population was 13.4%. The prevalence of overweight (defined as weight-for-height $\geq 90^{\text{th}}$ percentile) was 3.1% and prevalence of obesity (defined as weight-for-height $\geq 95^{\text{th}}$ percentile) was 6.6%. High birth weight and obesity in mother were identified as the major risk factors of obesity in children. The observation of increased underweight as well as obesity among preschool children suggests that the diet of these children may be relatively adequate in quantity but inadequate in quality of nutrient intake. On the other hand, family-based interventions are needed to prevent obesity and its long-term consequences in this population.

Overweight and obesity among future physicians

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Overweight and obesity are recognized as an "escalating epidemic" affecting both developed and developing countries. Recent studies have indicated the presence of increasing trends in overweight among adolescents. The aim of this study was to assess the prevalence of overweight and obesity among female medical students in north of Iran (Guilan). A cross-sectional study involving 141 students aged 18-26 years was obtained from medical school. Overweight was defined as BMI of 25.0 to 29.9 kg/m² and BMI ≥ 30.0 kg/m² was defined as obese. A waist circumference (WC) ≥ 80 cm or waist-to-hip ratio (WHpR) ≥ 0.8 was considered to represent central obesity. The finding revealed that 10.6% of students were overweight and 0.7% was obese. Central obesity was 9.2% (using the WC) and 13.4% (using WHpR) cut-offs. Educational and preventive programs for weight control and a healthy lifestyle among Iranian females should be emphasized from young adulthood or perhaps earlier.

Association of body mass index with educational level in Iranian men and women

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Objective: We investigated the relationship between educational level, body mass index (BMI), waist to hip ratio (WHR), physical activity and parity in a group of Iranian men and women living in Tehran.

Subjects and Design: 315 men aged 33.1 (22-46) and 403 women aged 27.9 (22-45 years) were studied in a cross-sectional design. The subjects were classified in two educational levels: low education (\leq 12 years schooling) and high education ($>$ 12 years schooling); and body mass index (BMI), waist to hip ratio (WHR), physical activity and parity (in women) were compared in two groups in men and women, separately.

Results: After controlling for age and smoking, women with higher level of education showed a significantly lower mean BMI than less educated women (24.8 ± 4.2 vs. 28.3 ± 4.9 $p < 0.01$), while more educated men had higher mean BMI than less educated men (28.4 ± 4.3 vs. 26.7 ± 4.5). In multiple regression analysis, physical activity in leisure time in men and years of education in women were the only determinants of BMI. After controlling for BMI, WHR was not related to the level of education in either men or women.

Conclusion: The present data indicated an educational difference in BMI for the study Iranian men and women. In Iranian women, as the women in the developed countries, the level of education was negatively related to BMI, while in men the association was positive.

Fatness and obesity among Omani University students

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Fatness and obesity are well-recognised risk factors for type 2 diabetes, cardiovascular diseases and metabolic syndrome. Oman is considered to have increasing high prevalence of type 2 diabetes. A study was conducted among young and fit Omani university students looking for prevalence of fatness and obesity. 240 students aged between 18 to 27 years, half of them were male; were studied. BMI; Waist and hip circumference, body fat, blood glucose and blood pressure were measured. Using BMI; 14% females were overweight and 4% were obese; while 23% males were overweight and 6% were obese. Eight percent of males and 20% of females were having high waist to hip ratio. Six percent of males and 14% of females were fatter. Nine percent of males and 0.8% of females were having hypertension. None of students were having hyperglycaemia. This study shows a high percentage of young Omani students are overweight, obese and fatter. These findings may explain the high prevalence of diabetes in Oman and long-term plan is needed for prevention of the complications.

Prevalence of overweight among 7-9 year old Indian school children

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A cross-sectional study was conducted in two public schools of West Delhi area in order to determine the prevalence of overweight among children aged 7-9 years and to assess their physical activity and nutrient intake. Weight and height of 604 children was measured and overweight was assessed using weight for height (>2 Z scores) criteria given by WHO, 1995. Information regarding physical activity pattern and general dietary pattern of children was obtained through a questionnaire. Dietary intake of a random sub-sample (n=48) was assessed using 2 day 24 hr recall and food frequency questionnaire. A prevalence of 12.1% overweight among children was observed. Overweight children were taller and heavier than their normal weight counterparts. Amongst the familial factors, a higher income and mother's overweight were observed to be important risk factors for children being overweight. Overweight children were comparatively indulging more in sedentary activities as well as spending more time on such tasks. Though eating out was not common among the group, overweight children ate out quite frequently and revealed a higher preference for calorie rich foods. Further, overweight subjects revealed an excessive energy intake and there was a significant inter-group difference in the nutrient intake. Fat intake of the entire group was high and overweight children derived more than one third of the total energy from fats. About one third of the parents were aware of their ward's weight status and majority of them identified low physical activity as a causative factor. In conclusion it can be said that prevalence of overweight among 7-9 year old children going to two public schools in West Delhi area was high enough to warrant concern. There is a need to correct the dietary pattern as well as lifestyle of the children. Moreover, parents of children also need to be made more aware and conscious about the weight status of their children.

Obesity and dietary habits of Chinese school children in Kota Bharu, Kelantan, Malaysia

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The purpose of this study is to determine the prevalence of overweight and obesity of children in an urban area, and mapping the association between environmental factors and nutritional status in children. The respondents of this study comprised of 278 Chinese children (144 boys and 134 girls) aged between 10 and 12 years old. They were selected from a primary school in the town of Kota Bharu, Kelantan. Overweight in children was defined as Body Mass Index (BMI) equal to or greater than the 85th percentile for age and sex. Whereas, those who fulfilled this criteria and also had triceps skinfold thickness equal to or greater than the 90th percentile for age and sex were categorised as obese. Respondents were asked to complete a food record and a physical activity diary for 3 days. Socioeconomic characteristics and dietary habits were also recorded, and a knowledge, attitude and practice (KAP) questionnaires on food and nutrition were also administered. The results showed that 1.4% of the respondents (n=4) were at risk of overweight and 23.4% respondents (n=65) were identified as obese. This obese group was made up of 72.3% boys and 27.7% girls, respectively. Unpaired t-test and Chi-square test were used to test the null hypothesis. It was found that overweight and obese respondents were more likely to skip breakfast and less frequency of snacking, however, they do have a tendency to consume more total calorie, protein and fat daily as compared to respondents who are normal weight. Although overweight and obese respondents were equally active as compared to normal weight respondents, however, it was found that their achievement in physical education was lower than normal weight respondents. The mean monthly income among parents of overweight and obese respondents was lower than the control group. The Pearson correlation analysis showed that the intakes of calorie, protein and fat had significant positive relationships with anthropometric measurements and BMI of respondents. Furthermore, frequency of fast food intake also showed a positive correlation towards body weight. On the contrary, frequency of snack intake was negatively related to body weight, upper arm circumference and BMI of respondents. Parents' monthly income was also found to be inversely associated to the above anthropometric measurements and BMI of respondents. Linear multiple regression analysis revealed that protein intake, frequency of breakfast and parents' economic status were significant predictors of the three anthropometric measurements and BMI of respondents.

Prevalence of obesity among schoolchildren (11-12 years old) in rural district of Hulu Terengganu

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This study was conducted in rural district of Hulu Terengganu to determine the prevalence of obesity and overweight among schoolchildren aged 11-12 years old. A total of eight rural schools were selected and subjects were comprised of 729 pupils. By using the reference of weight-for-height as the criteria, results revealed that 12.5% was found obese (>120% of reference). It was noted that the proportion of obesity among the female students was higher (7.6%) compared with the male students (4.9%). There was no significant difference ($p > 0.05$) between prevalence of obesity among Year 5 (6.2%) and Year 6 (6.3%) students. Notwithstanding, results showed a higher percentage of overweight (30.5%- 100-120% of reference) among the subjects studied. There were 16.2% and 14.3% of the female and male students were obese, respectively. From a total of 729 subjects, 222 were recruited to be involved in a further study by answering a set of questionnaires. It was found that several factors influenced the incidence of obesity such as a number of the obese subjects also had an obese mother(s) (52.4% ; $p < 0.01$). Moreover 61.9% of the obese respondents showed a moderate level of nutritional knowledge score that may affect food choice. Consumption of carbohydrate-rich food of 66.7% and frequent snacking pattern of 50.0% also believed to contribute to the prevalence of obesity. It was found that 52.0% of the obese respondents had low out-door activity (<1 hour/day) where more time were spent for watching television (>3.5 hours/day) which also accompanied with snacking (61.9%). As a conclusion, nutritional status of the rural children nowadays is progressively shifting towards overnutrition. This overwhelming problem should be taken seriously since childhood overweight and obesity can lead to higher incidence of adult obesity.

Overweight and at-risk waist circumference are associated with household food insecurity among a sample of Malaysian rural women

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The objective of this study is to determine the nutritional outcomes of household food insecurity among women from poor rural communities in Sabak Bernam district. The Radimer/Cornell Hunger and Food Insecurity Instrument was utilized to categorize food secure and insecure households. Demographic, socioeconomic, coping strategies and anthropometric information were collected through in-depth interviews with 200 Malay and Indian women. More than 50% of the households experienced some degree of food insecurity. In general, the food insecure households were characterized as living below poverty line, had larger household size, more children and school-going children and mothers as housewives. There was no significant difference in calorie and nutrient intakes and number of servings from the four food groups. While women from food secure households has higher intake frequency of meat, legumes, milk and dairy products, food insecure women were overweight (26%) and obese (30%) than women from food insecure households (overweight=30%; obesity=9%). Similarly, more food insecure women (40%) had at-risk waist circumference (≥ 88 cm) than food secure women (29%). However, the percentages with high waist-hip-ratio (> 0.85) did not differ significantly between the two types of households (26.2% vs. 25.9%). Overweight and abdominal adiposity among the women were associated with a number of independent variables such as women as housewives, women with more children, larger household size and food insecurity. However, even after adjusting for factors that are related to body mass index and waist circumference, food insecurity remained as a significant risk factor for overweight (OR=1.94; CI=1.03-3.67) and at-risk waist circumference (OR= 1.27; 1.15-1.57). Given that obesity is an emerging public health concern in the developing nations, the findings that food insecurity is a risk factor for obesity and consequently other obesity-related diseases, must be further investigated.

Assessment of anthropometric measurements and life style practices among the Aborigines (adult) in Lembah Belum, Perak

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A study was conducted on 138 adults Aborigines to determine the nutritional status by using anthropometric measurements and life style practices in Lembah Belum, Grik, Perak. Subjects were comprised of 49 males and 89 females of Jahai (58.7%) and Termiar (41.3%). Illiterate among the respondents was 63.2%. The life style practices studied were smoking pattern, alcoholic consumption and daily physical activities. It was showed that 52% of the respondents were smokers and 34% consumed alcoholic drinks regularly. The most frequent daily physical activity for male subjects were farming (78.6%) and fishing (67.8%) whereas for the female respondents were washing clothes (98.1%) and cooking (98.1%). About 72.9% of respondents perceived their health as good whereas 14.6% did not concern about their health status. Mean of body mass index (BMI) of the respondents was $20.8 \pm 4.1 \text{ kg/m}^2$. There were 6.7% and 3.4% of the respondents categorized as overweight and obese, respectively. Notwithstanding, body fat classification from skinfold measurements revealed that only 0.8% of the respondents were obese. Results also revealed that women showed a higher mean for body fat percentage (19.8%) compared with men (15.9%). Statistical analysis showed a significant difference between mean of body fat and age ($p < 0.05$). It was also noted that smoker subjects had lower BMI and those consumed alcoholic drinks also had higher BMI and waist to hip ratio. Pearson's correlation test between anthropometric measurements and socio-economic revealed the ethnic was the most important variable. This study found that Temiar had better economic status compared with Jahai. Therefore it can be concluded that nutritional status of the respondents studied was strongly influenced by socio-economic status. Since this community is isolated, cultural and social approach should be implemented in altering their lifestyle practices for improving nutritional and overall health status.

Prevalence of obesity, dietary intake and physical activity among secondary school students

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A study was conducted to assess the prevalence of obesity, dietary intake and physical activity among secondary school students in Sekolah Menengah Kebangsaan Bukit Baru (urban) and Sekolah Menengah Kebangsaan Jasin (rural) in Malacca. A total of 120 multi-ethnic Form 4 students, consisting of 60 students from the urban and 60 students from the rural schools was selected through simple random sampling. Data collection was carried out by interviews using a specially designed questionnaire. Weight and height were measured using the TANITA electronic weighing scale to the nearest 0.1 kg and the Bodymeter microtoise tape to the nearest 0.1 cm. Body Mass Index (BMI) was computed accordingly. The dietary intake was assessed through 24-hour dietary recall while physical activity was determined using the physical activity record. Data were analysed using SPSS (Statistical Package for the Social Sciences) programme version 11.0. Majority (50.0%) of the students were Chinese, in the age range of 16 to 17 years old. The mean dietary intakes were $2199 \pm 698 \text{ kcal}$ and $2366 \pm 698 \text{ kcal}$, for the urban and rural students, respectively. The mean energy expenditure for the urban ($1720 \pm 275 \text{ kcal}$) and rural ($1696 \pm 298 \text{ kcal}$) areas showed no significant difference. Majority of the students showed positive energy balance with a mean of $574 \pm 635 \text{ kcal}$. The mean BMI was $20.8 \pm 3.7 \text{ kg/m}^2$. Out of 120 students, 10.8% of the students were classified as underweight (BMI according to age $< 5^{\text{th}}$ percentile) and 10.8% were obese (BMI according to age $> 85^{\text{th}}$ percentile). The t-test showed no significant difference in total dietary intakes and physical activity between students from the urban and rural areas. Pearson correlation test showed a significant negative correlation between energy balance and BMI ($r=0.209$, $p<0.05$). In conclusion, the prevalence of obesity among the secondary school students was quite high. Both underweight and obesity appeared concurrently among this population. There is a need to take into consideration this phenomenon because both underweight and obesity are important risk factors in many diet-related chronic diseases and other health problems. Appropriate educational intervention programs should be introduced as early as in the teenage years to modify dietary intake and physical activity pattern in the prevention of obesity as well as low body weight.

Prevalence of obesity and other cardiovascular disease (CVD) risk factors in type 2 diabetic subjects

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A study was conducted to determine the prevalence of obesity and other cardiovascular disease (CVD) risk factors of a sample of subjects with type 2 diabetes mellitus from Felda Palong 1 to 11, Gemas, Negeri Sembilan Darul Khusus. A sample of 237 type 2 diabetes mellitus subjects (136 females and 101 males) aged between 31 to 67 years was selected using random cluster sampling based on the list of settlers obtained from the Felda office. Physical assessments were measured including height, weight, waist and hip circumferences, and systolic and diastolic blood pressure. Overnight fasting blood samples were analysed for lipid profile and other blood parameters using the Hitachi Chemical Analyser model 902. The mean age of the subjects was 50.6 ± 6.09 years. Majority (72.2%) of the subjects were Malays and 27.8% were Indians. Only 11.8% of the subjects smoked, 28.3% self-reported of being hypertensive and 8.9% had been diagnosed with heart disease. The mean systolic (SBP) and diastolic blood pressure (DBP), pulse rate, waist hip ratio (WHR) and body mass index (BMI) were 140.4 ± 22.5 mmHg, 91.9 ± 12.8 mmHg, 76.1 ± 13.1 , 0.91 ± 0.10 and 27.5 ± 5.0 kg/m², respectively. Based on the BMI, 47.3% were overweight and 22.4% were obese. Android obesity (men WHR >0.95, female WHR >0.85) was prevalent among 53.5% men and 70.6% females. They are considered to be at greater risk for cardiovascular disease. Using waist circumference (waist circumference > 102cm men and 88cm female) as an indicator of risk, 18.8% men and 61.0% females are also at increased risk of CVD. About 61.2% had high blood pressure (SBP \geq 140 mmHg and/or DBP \geq 90 mmHg). The mean total cholesterol (TC) was 5.18 ± 1.37 mmol/L, high density lipoprotein cholesterol (HDL-C) was 0.74 ± 0.46 mmol/L, triglycerides was 1.58 ± 0.83 mmol/L and low density lipoprotein cholesterol (LDL-C) was 3.73 ± 1.21 mmol/L. BMI was correlated significantly with HDL-C ($r=-0.138$ $p<0.05$), age ($r=0.135$ $p<0.05$), DSP ($r=0.203$ $p<0.01$), waist ($r=0.522$ $p<0.01$) and hip circumference ($r=0.622$ $p<0.01$). While WHR was correlated significantly with age ($r=0.241$ $p<0.01$), height ($r=0.270$ $p<0.01$), pulse rate ($r=-0.133$ $p<0.01$) and weight ($r=0.164$, $p<0.05$). Reducing overweight and obesity and targeting better dietary intake and increasing physical activity would be of great benefit in optimizing the control of the risk factors of cardiovascular disease in type 2 diabetes mellitus subjects.

Relationship between weight, body composition, body fat distribution and bone mineral density in postmenopausal Malay women

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This study was carried out to determine the relationship between weight, body composition and bone mineral density (BMD). A total of 113 Malay postmenopausal women aged between 50 to 65 years old around Klang Valley were recruited in this study. Bone mineral density at three sites, total body, lumbar spine L2-L4 and total hip were measured using dual-energy x-ray absorptiometry (DEXA). Fat mass (FM), lean body mass (LBM) were obtained from total body scan using DEXA. A height independent BMD (BMD/height) value was calculated to compute the volumetric density, which is independent of frame size. Mean weight of the subjects was 61.9 ± 10.9 kg, height was 1.52 ± 0.05 m, Body Mass Index (BMI) was 26.9 ± 4.9 kg/m² and waist hip ratio (WHR) was 0.81 ± 0.07 . Mean BMD for the total body was 1.06 ± 0.06 g/cm², lumbar spine was 0.98 ± 0.13 g/cm² and hip was 0.88 ± 0.11 g/cm². The T-test revealed no significant differences between body fat distribution (WHR \geq 0.85) with BMD as well as BMD/height at all sites. Pearson correlation analyses showed that weight, BMI, FM and LBM correlated with hip BMD ($p<0.001$), neck BMD and total body BMD ($p<0.05$). Meanwhile weight, BMI, FM and LBM correlates with hip BMD/height ($p<0.01$) and neck BMD/height ($p<0.001$). BMD/height at total body was correlated with weight, BMI, fat ($p<0.01$) and but not with LBM ($p>0.05$). Both, lumbar spine L2-L4 BMD and BMD/height failed to show any correlation with weight, BMI, FM and LBM. The strength of the correlation between weight and body composition decreased at all sites when BMD is expressed as BMD/height. However, the relationship between weight and body composition and hip BMD and neck BMD or BMD/height were maintained at a significant level. This shows that the importance of weight and body composition at the femoral bone is not masked by the area density.

Body fat and body image among adolescents in Singapore

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A body composition study among 477 Chinese, Malay and Indian female and male adolescents aged 12 to 18 years was conducted in Singapore in 2002. Weight and height were measured and body fat was determined using deuterium oxide dilution. A questionnaire was used to collect data on respondents' self-reported physical activity and dietary patterns. Actual body image assessed from 6 figures was correlated with measured body fat. More girls than boys indicated a lower than actual value (meaning "slimmer" body) as their ideal and the difference between ideal and actual was higher in girls than in boys. In girls, the ideal score was positively correlated with body fatness, indicating that their view of the "ideal" body was slightly subjective. This correlation was negative among the boys. The difference between actual and ideal was correlated with body fatness. This indicated that the higher the body fatness, the more deviant the desired body image was from the actual body image. Multivariate logistic regression was carried out to investigate the impact of actual body fat, demographic variables, physical activity and dietary pattern factors on desired body image. Those who wished to be slimmer were likely to be girls, had higher body fat percent, spent longer hours on sedentary activities, did not think they were good in sports and ate fast food more frequently.

The study of the psychological disorders in the obese patients of a diet clinic in Mashad

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Objective: the research was done to evaluate the psychological problems in the obese patients.

Method: 255 volunteer patients of a private diet clinic in Mashad were the sample volume. They filled out a questionnaire containing the questions about the history of psychological problems such as depression, anxiety, compulsion, tics, worrisome about physical appearance, etc. The data were analyzed by use of SPSS software.

Results: about 40% of the patients reported history of depression, about 30% anxiety, about 45% severe worrisome about physical appearance and about 35% the symptoms of Bulimia Nervosa.

P-22

The study of body mass index (BMI) and nutritional diet in the patients who request cosmetic rhinoplasty

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Objective: To know the correlation between obesity and cosmetic rhinoplasty we conducted the study.

Method: 30 patients who requested cosmetic rhinoplasty were our sample. Weight, height and body mass index of them were measured. The history of being under diet because of underweight was recorded, too.

Results: 43.3% of the sample was male and 56.7% were female. 80% of them were 17-24 years old. 66.7% were unmarried. 13.3% of them had the history of nutritional diet. 22.5% of them had BMI under 20. 63% had BMI 20-25 and 14.5% BMI above 25.

Conclusion: 77.5% of the patients who requested cosmetic rhinoplasty had overweight. It seems the adverse effect of overweight on self-esteem and body-image interfere in increasing request for cosmetic rhinoplasty.

P-23

Sweetness acceptance of cocoa flavoured milk among overweight and normal weight UKM students

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This study was conducted to find out the sweetness acceptance in cocoa flavoured milk between overweight (LBB) and normal weight (BBN) Malay and Chinese students. The study was carried out on 120 Universiti Kebangsaan Malaysia students (60 overweight and 60 normal weight) with average age of 22.7 ± 3.8 years old. Average body mass index (BMI) for LBB was $28.4 \pm 3.3 \text{ kg/m}^2$ and BBN was $20.3 \pm 1.8 \text{ kg/m}^2$. Determination of sweetness acceptance was carried out using hedonic 7 scale point on 2 type of cocoa milks which were mixed by cocoa powder with full cream milk powder and skimmed milk powder with added sucrose (% w/w). Attributes that were tested included sweetness, bitterness, viscosity, colour and overall acceptance but sweetness acceptance was focused. Colour test and Bricks test were also carried out on every sample. The results showed that the colour of full cream milk and skimmed milk were darker when sucrose percentage in samples increased. Bricks value for every sample of full cream milk and skimmed milk were different and the value increased when sucrose percentage in samples increased. The hedonic results showed that overall sweetness acceptance on full cream milk for LBB were lower than BBN insignificantly. LBB subjects had highest sweetness acceptance on sample Cp (5.0% sucrose) with mean score 4.24 ± 1.61 , where as BBN had highest sweetness acceptance on sample Dp (7.5% sucrose) with mean score 4.60 ± 1.89 . Significant difference between LBB and BBN were only noted on bitterness taste of sample Ap (0% sucrose) and sample Bp (2.5% sucrose) and also total acceptance of sample Ap. As for full cream milk, sweetness acceptance for both Malay and Chinese LBB were lower than each BBN. Chinese LBB and BBN had the same highest sweetness acceptance as Malay LBB, which were on sample Cp for LBB groups and on sample Dp for BBN groups. However, no significant difference ($p > 0.05$) was noted for all full cream milk sweetness acceptance comparisons neither between nor within Chinese and Malay. Significant difference ($p < 0.05$) were only noted for sweetness acceptance on sample Dp between Malay LBB and Malay BBN. Overall sweetness acceptance on skimmed milk was the same between LBB and BBN. Both groups had highest sweetness acceptance on sample Ds (7.5% sucrose) with mean score 3.77 ± 1.81 (LBB) and 3.82 ± 2.00 (BBN). However, no significant difference ($p > 0.05$) was noted between LBB and BBN for all comparisons of attributes on skimmed milk. The sweetness acceptance of skimmed milk for Chinese LBB was higher than Chinese BBN, where as sweetness acceptance for Malay LBB were lower than Malay BBN. Skimmed milk sweetness acceptance for Chinese LBB were higher than Malay LBB, where as sweetness acceptance for Chinese BBN were lower than Malay BBN. No significant difference ($p > 0.05$) was noted for skim milk sweetness acceptance comparisons neither between nor within Chinese and Malay.

P-24

Weight changes among participants attending weight management camp in Kuala Lumpur

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A study was carried out to determine the effectiveness of a weight management programme among participants of a weight management camp. Subjects consisted of 27 adults (22 women, 5 men) who had participated in weight management camps organized between November 1998 and October 2001. Anthropometric measurements measured were weight, height, waist and hip circumference. Body mass index (BMI) and waist to hip ratio (WHR) were subsequently calculated. A self-administered questionnaire was distributed to the subjects to gather information on demography, food habits and physical activity. The mean age for men was 33±9.5 years while 35±10 years in women. Mean BMI and WHR among men were 27.5±4.2 and 0.96±2.4 while in women 30.0±4.2 and 0.82±3.3 respectively. 67% subjects recorded weight loss while the remaining 33 % experienced weight gain. The mean weight loss for those who successfully lost weight was 6.7±6.0 kg and this weight loss ranged between 0.8 kg to 22.0 kg over a mean duration of 18±7 months (range 11 to 35 months). 63% subjects reported being physically active while 37% sedentary. Brisk walking was the physical activity adopted by a majority of the subjects (41%) to aid them in losing weight. Among the subjects, 66% preferred fried foods over grilled, boiled or steamed foods (22%). 63% subjects admitted having tried weight reduction products but stopped taking them due to the side effects such as diarrhea and headache. The results of this study demonstrated that the key to achieving and maintaining weight loss is to increase physical activity and to modify dietary habits and behavior.

P-25

Insulin resistance and ferritin as major determinants of nonalcoholic fatty liver disease in apparently healthy obese patients

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Objective: The aims of this study were to test the possible association between non-alcoholic fatty liver disease (NAFLD) and iron and insulin resistance, and to determine the prevalence of NAFLD in apparently healthy obese subjects.

Design: Cross sectional, clinical epidemiologic study.

Subjects: Two hundred and ten apparently healthy obese patients, aged from 18-65 years, with a body mass index (BMI) of 28 or more, were enrolled in a body weight reduction program in our hospital.

Measurements: All the subjects underwent screening and pre-program examinations including anthropometric data measurements, biochemistry testing, and ultrasonography of the liver. NAFLD was defined as fatty liver diagnosed by ultrasonography plus persistent elevation of alanine aminotransferase (ALT) levels.

Results: Of the 210 patients, 80% (168/210) had fatty liver. Persistent ALT elevation in two separate tests was further detected in 25.6% (43/168) of patients. Multiple logistic regression analysis showed waist circumference and insulin resistance to be independently associated with fatty liver. Serum ferritin level and insulin resistance were two major risk factors predicting NAFLD.

Conclusion: The prevalence of NAFLD was 20.5% (43/210) in obese patients. Because both hyperinsulinemia induced by insulin resistance and iron overload represented by ferritin elevation might damage hepatocytes, we concluded that these two factors were significantly associated with NAFLD in obese patients

Obesity in Asia: A learning module for health professionals

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This is multimedia presentation designed as a learning module for health professional and undergraduate students in the health sciences. The components of the module were divided into 10 sections:

1. Introduction – objectives of the module, definition of terms, overweight and obesity
2. Epidemiology – trends, prevalences and incidences in Asia and the worldwide
3. Causes of obesity
4. Complications – medical, social and psychological
5. Management – treatment, dietary, physical activity, behavior therapy and surgery
6. Prevention – strategies in prevention approaches
7. Cost – direct and indirect cost
8. Obesity in China
9. Obesity in Malaysia
10. Evaluation of the module - content evaluation and course objective evaluation

This is a preliminary work on obesity in Asia, which will incorporate many newer data in the near future and will be posted as a web-based learning material in the public domain on the Internet.

Laparoscopic vertical banded gastroplasty versus laparoscopic gastric bypass: A randomized trial for treatment of morbid obesity

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Objective: To compare the outcome, quality of life, and costs of laparoscopic vertical banded gastroplasty (LVBG) and laparoscopic gastric bypass (LGBP).

Summary of Background Data: Randomized trials have proven significant greater weight loss after gastric bypass (GBP) in comparison with vertical banded gastroplasty (VBG). Recent advancement in laparoscopic surgery has made LVBG and LGBP as an alternative for the conventional open approach of VBG and LGBP. However, there is no trial comparing LVBG and LGBP yet.

Methods: From December 2000 to February 2002, 80 patients (24 men and 56 women, mean age, 32 years; ranges, 18-57 years) affected from morbid obesity (mean body weight 119.7Kg; range, 81-174 Kg; mean body mass index (BMI), 43 Kg/m²; range, 36-72 Kg/m²) were enrolled in a prospective trial and randomly assigned to LVBG or LGBP. The operative time, estimated blood loss, length of hospital stay, operative complications, percentage of excess weight loss were assessed. Changes in quality of life were assessed using the Gastro-intestinal quality of life index (GIQLI).

Results: The conversion rate was zero for LVBG and 2.5% (1/40) for LGBP. No mortality was recorded in the overall population. Surgical time was significantly longer for the LGBP group (209 minutes vs. 126 minutes for LVBG; $p < 0.001$). Mean hospital stay was 3.5 days for the LVBG versus 5.7 days for LGBP ($p < 0.001$). Post-operative analgesic dose usage was also less for LVBG patients (mean dose 1.4 vs. 2.4; $p < 0.05$). Early complication rate was much higher in LGBP group (17.8% vs. 2.5%; $p < 0.001$). All of the three major complications were in LGBP group and two were related to anastomotic leakage (5%). Late complications consisted of upper gastrointestinal bleeding, stenosis and others observed in four LGBP patients (10%) and two LVBG patients (5%). Mean follow-up was 16 months (from 14 to 26 months). Weight and BMI were reduced significantly in both groups with significant improvement of obesity-related co-morbidities. At one year, LGBP had better excess weight reduction than LVBG (61.4% vs. 53.8%) as well as lower BMI than LVBG (mean BMI 29.2 vs. 31.5) but without statistical significance. There is no difference between the two groups in the reduction of obesity-related laboratory abnormalities except a lower hemoglobin level in LGBP (11.8 vs. 13.8, $p < 0.05$). Preoperative GIQLI scores were similar between groups; however, at 1 year after surgery, LGBP patients had better GIQLI scores than LVBG patients (121 vs. 106, $p < 0.01$). LVBG had improvement in physical condition, social function and emotional conditioning but deterioration in gastrointestinal symptoms, which resulted in no increase of total GIQLI score.

Conclusion: The preliminary results of current study show that the LGBP is a time-consuming, technique demanding operation with higher early complication rate as compared with LVBG. Although both operations are effective treatment for morbid obesity including significant weight reduction and decreasing obesity-related co-morbidities, LGBP had a trend of greater weight loss and significantly better quality of life than LVBG. However, LGBP had a significant long-term trace element deficiency state. Every patient should be tailored for different surgery according to patient's decision.

P-28

Habitual caffeine intake affects weight-loss and affects the effect of green tea on weight-maintenance thereafter

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Aims: Investigation of the effect of green tea on weight-maintenance after -loss in relation to habitual caffeine intake.

Methods: In a randomized placebo-controlled double blind parallel trial in 76 subjects, (BMI=27.5±2.7 kg/m²; 40±10yrs) matched for habitual caffeine intake, a 4-week very low energy diet (2.1 MJ/d) was followed by 3 months green tea (epigallocatechin gallate + caffeine), or placebo.

Results: Leptin concentration was inversely and satiety was positively related to habitual caffeine intake ($r^2=0.7$; $r^2=0.6$; $p<0.01$). Reduction of weight (6.7±0.7 vs 5.5±0.6kg), fat-mass (4.4±0.4 vs 3.1±0.3 kg), waist-circumference (6.7±0.6 vs 5.1±0.5 cm), respiratory quotient (RQ) (0.06±0 vs 0.04±0) and of decrease in resting energy expenditure (REE) (0.5±0.06 vs 0.8±0.09 MJ/d) was larger in the high- than in the low-caffeine consumers ($p<0.01$). During weight-maintenance green tea reduced body-weight (-0.6±0.1 vs + 3±0.4kg), waist (-2.0 vs +0.1 cm), RQ (-0.01±0 vs +0.2±0) and body-fat (-1.6 vs +0.3 kg) further, and increased REE more (+1.0 vs 0.5 MJ/d) in habitual low-caffeine consumers, compared to placebo or high-caffeine consumers ($p<0.01$).

Conclusion: Thermogenesis and fat-oxidation increased body-weight loss in high caffeine consumers, and weight-maintenance in low caffeine consumers receiving green tea.

P-29

Obesity management through psychologic personality studied by Szondi's test

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The field of comorbidity between organic pathologies and mood disorders remains insufficiently explored, whereas such association predict a more unfavorable outcome of organic pathologies themselves. A diet always induces a weight loss in the short term. A cognitive-behavioural – nutritional approach allows a lasting weight loss. Personality's dynamic of 20 patients with overweight was studied through given informations collected during semi directing interview after Szondi psychotechnic test. They are 16 females and 4 males, 44 old years (29 to 68), BMI = 34 (31 to 46). Several stable psychologic characteristics are found: narcissic weakness, intolerance against frustrations with immediate acting out to prevent from emergence of distress due to frustration, egocentric position in search of idealistic relation consequently disappointing and productive of aggressivity, nervous breakdown with introversion and heaving difficulty in expression of emotion. Three psychologic profile are identified: adapted dependant subject (8 patients: the main problem is: how can they become autonomous), unadapted rebel subject (6 patients: the question is: how to identify and to manage the wrath) and undecided depressive subject (6 patients, who need in first psychotherapy because nervous breakdown). Analysis of Szondien personality when announcement of diagnosis, has a strong prediction to determine patient's compliance. One year later, the reduction of overweight reaches 5 kg (0 to 8). This preliminary experience continues. The psychological follow up associated with education can permit modifications of life style.

Effective weight management and weight-gain prevention communications for pre-teens – identifying how, what and where?

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Previous KAP (knowledge, attitude and practice) research by AFIC (Asian Food Information Centre) and its US-based sister organization, IFIC, has found that children's understanding of the role of a nutritionally balanced diet, and regular physical activity in maintaining good health is reasonably accurate. However, high levels of overweight (>25% of survey population) amongst the 1815 children aged 10-12 years from middle-income families in the 2001 AFIC-commissioned survey suggests that this knowledge is insufficient to achieve effective weight management. Positive correlations of lifestyle and food consumption habits, with overweight/obese status of children, found in the AFIC surveys, highlighted a need for more in-depth study of attitudes and environmental factors, which impact on reception and perception of weight-gain prevention messages. Similarly, IFIC's KAP research programme of very similar population samples (children aged 8-12 years, recruited from a representative mix of social and ethnic groups) has progressed from the gathering and synthesis of information on KAP, to applied research into the development of targeted messages, based on a consumer message development model. Recognising that effective message content and delivery must be truly culturally specific, AFIC intends to conduct focus group sessions with children aged 10-12 years, and a small number of in-depth interviews with parents in Malaysia and Philippines. The model used by IFIC will be used as reference in developing research scope and objectives, but the results and recommendations for next steps in overweight prevention communication strategies will be based on local findings. In addition to providing insight into the appropriate and effective prevention of weight-gain messages in the two countries, it is hoped that comparison of the findings will also contribute to generic understanding psycho-social factors contributing to the global rise in overweight and obesity amongst children.

“Whiz kids through fitness”: A PASOO project

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The growing epidemic of overweight and obesity has affected not only the adult population but also children, even in developing countries like the Philippines. In order to address the problem of obesity, it is imperative that a preventive program be carried out starting from the young. In line with this, the Philippine Association for the Study of Overweight and Obesity (PASOO) has initiated a program that caters to school children in order to promote healthy lifestyle, with emphasis on regular physical activity and proper diet. This involves a comprehensive program of physical activity and nutrition promotion among primary school children (Grades 1-3) starting in a pilot school in Metro Manila, and then later expanding to other schools. The program which has started this school year, consists of a physical activity component and a nutrition education component that are integrated with the curriculum of Grades 1-3 pupils, at the same time involving the parents of the children. The nutrition component consists of integrating messages in nutrition and proper diet in the various curricular subjects, while the physical activity component consists of simple exercises between classes and during physical education sessions. The project is expected to continue in the coming school year while a process and impact evaluation is conducted to determine progress and effectiveness of the program.

Nutrition management of post lap band surgery patient: A case study

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Introduction. Obesity management should be tailored to the individual's needs. Obesity can be managed by nutritional intervention or combined with exercise, drugs or surgery. The latest morbid obesity management at the Singapore General Hospital is the Lap Band procedure, a multi-disciplinary approach inclusive of surgeon, endocrinologist, dietitian, psychologist and physiotherapist. **History.** Patient is 55 years, female, BMI 43.4. Medical history - morbid obesity with DM Type 2 and OA knees. Social history - housewife with low education, lives with daughter and family. Previous weight reduction strategies include conventional diet, exercise and various drugs without success. **Nutritional Management.** Pre-surgery, patient was interviewed on dietary intake. Weight at week 0 was 94 kg, excess 33.2 kg. In January 2003, patient underwent the Lap Band procedure. No major side effects were reported. Dietitian followed up on the three phases of diet therapy - liquid, transition and solid phases. During the liquid phase, patient's compliance was poor as she experienced constant hunger. At week 4, weight decreased to 92.9kg (3.3% of excess weight). During the transition phase, compliance improved, as pureed foods provided bulk and satiety. At week 8, weight measure was 90.2 kg (total weight loss = 3.8kg, 11.4% of excess weight). During the solid phase, patient's compliance deteriorated as patient reverted to pre-surgery eating habits. At each session, Dietitian reiterated and reinforced the importance of dietary control and compliance to achieve weight loss. **Conclusion.** Amount of weight loss depends on compliance to dietary recommendations. Family support also play a role in motivating and ensuring changes in lifestyle and habits. From literature review, Lap Band patients may achieve 50-70% loss of the excess weight. The above patient will be followed up closely to achieve optimum weight loss.

Effects of an internet-based exercise program on physiological changes in adult overweight females: A pilot study

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The present study was conducted to determine the effectiveness of a Personalized Activity Monitor (PAM) in facilitating physiological changes in adult females. A total of 24 overweight (BMI ≥ 23.0 kg/m²) females participated in this study. They were randomly assigned to the PAM + Advice on Exercise Intervention (PAM) (n=9, 38.3 \pm 6.9 yrs and 24.9 \pm 1.2 kg/m²) or Advice on Exercise only (Control) (n=15, 38.2 \pm 6.7 yrs and 27.0 \pm 3.0 kg/m²). Both groups underwent anthropometric, body composition, health and fitness assessments before and after a 3-month intervention. Height was measured without shoes using a SECA bodymeter 208, and body weight with minimal clothing was measured using Tanita TBF-410 (Japan). The triceps skinfold thickness (TRI) was measured using a Holtain skinfold caliper (U.K.). Systolic and diastolic blood pressures were measured with a GO-II mercury sphygmomanometer (Japan). The 20-m shuttle-run test was carried out to obtain the total run, which was subsequently used to estimate the VO₂max by means of a sample-specific regression equation. Paired t-tests were used to determine the differences within groups over time. Due to the heteroscedasticity of some of the data, log transforms were employed for statistical analysis. Systolic blood pressure (SBP) slightly decreased in PAM (pre: 116.0 \pm 9.5mmHg; post: 115.3 \pm 11.1 mmHg), while diastolic pressure (DBP) remained the same (pre: 76.2 \pm 9.2 mmHg; post: 76.2 \pm 6.0 mmHg). There was an increase in SBP (pre: 111.9 \pm 15.0 mmHg; post: 112.5 \pm 11.0 mmHg) and DBP (pre: 71.3 \pm 8.3 mmHg; post: 72.3 \pm 6.9 mmHg) in the Control group. However, these differences were not significant in both groups. The TRI increased significantly in the Control group (pre: 31.2 \pm 4.7 mm; post: 32.7 \pm 4.9 mm, p=0.029), but not in the PAM (pre: 34.3 \pm 4.4 mm; post: 33.7 \pm 4.4 mm, p>0.05). Estimated VO₂max in the PAM group did not change (pre: 31.7 \pm 3.3 ml.kg⁻¹.min⁻¹; post: 31.7 \pm 4.5 ml.kg⁻¹.min⁻¹), but decreased significantly in the Control group (pre: 30.5 \pm 2.2 ml.kg⁻¹.min⁻¹; post: 29.1 \pm 2.9 ml.kg⁻¹.min⁻¹, p=0.007). In conclusion, the findings reveal that those who used PAM showed improvements or maintenance in all the body composition, health and fitness variables compared to those who did not (Control), although not all differences were significant. It is suggested that a bigger sample size is needed to find more time effects.

P-34

Amino acid conjugated small molecules in insulin resistant obese-diabetic animal models

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Using a technology platform of combining "smart chemistry" and "Rational Drug Design Approach" (RDDA) with a highly creative library of compounds, several orally active small molecules have been designed and synthesized. BLX-2000 series compounds are di-peptide conjugates whereas BLX-1000 series compounds are single amino acid derivatives. BLX-1002 and BLX-2001 were extensively studied in insulin resistant ob/ob and db/db mice model. BLX-1002, when given orally at a dose of 50 and 100 mg/kg body weight per day, for 22 days, it was able to reduce body weight gains in *Ob/Ob* (C57/BL/6J-Lep^{ob}) mice fed in normal *ad libitum* diet with free access to water. The vehicle treated animals gained 16% weight compare to initial day whereas 50 mg/kg treatment showed 5% gain and 100 mg/kg actually reduced 1.26%. The body weight lowering effect was dose dependent and the effects remain after one week of withdrawal of BLX-1002. It also reduced the epididymal fat weight and liver weight in this model. In db/db (C57/BLKS/) mice, it dose (12.5-100mg/kg) dependently lowered body weight and blood glucose levels ($p < 0.05$). It significantly lowered free fatty acid and triglyceride levels compare to control animals. In high fat diet model in C57 mice, BLX-1002 reduced body weight and significantly ($p < 0.05$) improved oral glucose tolerance. In both models, di-peptide conjugates showed very similar effects like BLX-1002. BLX-1002 did not induce $\alpha P2$ expression in human pre-adipocytes most probably it is not an agonist of PPAR γ . BLX-1002 strongly inhibited lipopolysaccharide (LPS) induced pro-inflammatory cytokines like IL-6 and TNFK production in both *in vitro* and *in vivo*. Pharmacokinetics study showed the oral bio-availability of the amino acid conjugated molecule and its related metabolite. A repeat dose 14 days chronic toxicological studies in rats and mice did not show any adverse effects. BLX-1002 is well tolerated in both models up to the highest tested dose of 200 mg/kg body weight. The mechanism of action of BLX-1002 is currently being investigated. These results combined demonstrate the potential of these amino acid conjugates as novel compounds for the treatment of Type-II diabetes and related disorders.

P-35

Child and adult obesity control: The growth monitoring and promotion approach

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Although growth monitoring and promotion was initiated in the 1960s for early screening and control of child malnutrition, its appeal in modern malnutrition management in Nigeria and elsewhere appear to be on the decline. Reasons for this have included poor knowledge, lack of compliance of health workers and mothers, limited working tools, cost effectiveness and poor child nutritional outcome. Unfortunately critics have neither proposed an effective alternative nor addressed the increasing epidemics of child and adult obesity coexisting with chronic underweight or the pervasive lack of nutritional knowledge in Nigeria. The paper reviews the prevailing practice of growth monitoring and promotion, identifying the structural weaknesses as presently constituted, especially its focus on involving only the mothers- who are more likely to be poor, malnourished, of little education and heavily overburdened to the exclusion of the men that provide the fund, encouragement and are better educated. We thus propose couple involvement in growth monitoring and promotion as a new strategy to address the nutritional concerns of parents and under 5 children simultaneously with a workable framework for its implementation.

Pathogenesis and pathophysiology of ventromedial hypothalamic lesioned rats

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Hypothalamic obesity could be produced by destroying several sites in the hypothalamus in rats; venteromedial nucleus (VMH) lesions, paraventricular nucleus (PVH) lesions, arcuate nucleus (ARH) lesions, dorsolateral tegmental region (DLT) lesions, knife cut between VMH and LH, and hypothalamic island. Regarding the pathogenesis of VMH lesions-induced obesity, it had been long presumed that hyperphagia induced by the destruction of a satiety center which resides in VMH is the primary factor for the development of VMH lesion-induced obesity. Using rats with pancreatic transplants, we demonstrated that neurally mediated hyperinsulinemia is the most important factor for the development of obesity in these rats. We also found that both hyperactivity of vagal nerve and hypoactivity of sympathetic nerves after VMH lesions contributed to the hyperinsulinemia. Further, we found that hyperinsulinemia accelerated fat accumulation by stimulating lipogenesis in the liver and adipose tissues, stimulating lipid deposition into the adipose tissues and inhibiting lipolysis in the adipose tissues. Now, it has turned out that there exist two different causes of hypothalamic obesity; hyperinsulinemia-oriented and hyperphagia-oriented hypothalamic obesity. We have recently found that VMH lesioned rats showed cell proliferation in visceral organs (stomach, small and large intestines, liver and pancreas), which were amply innervated by vagal nerve, as well as adipose tissues. We demonstrated that main cause of cell proliferation in visceral organs is vagal hyperactivity, in these rats, whereas that in adipose tissues is hyperinsulinemia. We also found that the increases ability of cell proliferation in the liver and pancreas contributed to restore liver and pancreatic DNA content after partial hepatectomy and pancreatectomy. In summary, hyperinsulinemia and derangements of autonomic nervous system are very important factors in the pathogenesis and pathophysiology of VMH lesion-induced obesity.

Nutritional profile of Indian adolescent girls: Relationship with self-concept

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Adolescence is a period of transition from childhood to adulthood and is characterized by dramatically accelerated physical, biochemical and emotional development. The physical growth pattern during adolescence indicates that velocities of various growth characteristics like weight and height are directly related to sexual maturity. The fact that rapid growth characteristics of adolescence, is more related to weight, suggests that nutritional status is an important determinant of the physiological maturity. In India even today one of the neglected subjects of research is the adolescent girl. Also, the data collected on adolescents is one country may be valid for only a few years due to the secular trends being operational in many affluent sections of the population. Hence constant updating of such data is essential which adds to the significance of the study. The present study is an attempt to ascertain the relationship between nutritional profile, dietary patterns and self-concept of adolescent girls. The sample comprises of 200 girls (13-17 years) from state run and private co-educational schools. Data on anthropometric measures like height, weight, waist and hip circumference is collected-BMI, waist / hip ratio computed. Information on nutritional awareness, dietary patterns, 24 hr recall is collected. To assess the self-concept a standardized test has been administered. Analysis has shown that nutritional knowledge among adolescent girls has gaps in spite of the fact that these girls are given this information in the classroom. Although a lot of them have moderate awareness about nutrition but this does not reflect the dietary pattern and eating habits. However, the nutritional profile has a direct bearing on their self-concept.

P-38

Effectiveness of physical activities on body weight reduction and its relation to dietary intake among women attending an aerobic center

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A study was conducted to relate the effectiveness of physical activities in reducing body weight and its relation with the dietary intake among women attending an aerobic center at Bandar Baru Bangi, Selangor. Twenty-four (24) women with Body Mass Index (BMI) exceeding 24 kg/m^2 were chosen using WHO (1995) classifications. Physical activity, dietary intake and respondents' perceptions were studied in relation to body weight reduction. Waist, hip, thigh, and arm circumferences and body weight were recorded each week to observe any changes. Other data were collected using a set of questionnaires that includes respondents' background information, knowledge, food habits and their perception. The 24-hour dietary recall was recorded to determine their energy intake. Data was analyzed using the Statistical Package For The Social Sciences (SPSS) and Diet 4 programme. Descriptive statistics were used to describe the data. The relationship between the studied factors with weight reduction was analyzed using Pearson Correlation. The results showed that the reduction in body weight ranged between 0.2 to 2.6 kg at the end of 8 weeks with 4 subjects increased in body weight between 0.1-0.2 kg. There were no significant correlation between physical activities and weight reduction where $p=0.962$ and $r=-0.01$. Dietary intake and weight reduction also showed no significant correlation where $p=0.056$ and $r=0.395$. Respondents' perceptions also showed no significant correlation with weight reduction, $p=0.223$ and $r=-0.258$. As a conclusion, this study suggested that physical activities carried out by the women were not enough to reduce their body weight and there could be imbalanced in their energy intake.

P-39

Glycemic index of some commonly consumed Malaysian foods determined in obese individuals

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Blood glucose response and glycemic index (GI) of three Malaysian foods were determined among obese individuals. The test foods were *nasi lemak* (NL), *nasi goreng kampung* (NGK) and *teh tarik* (TT). Eight obese volunteers with BMI of 31.4 ± 1.3 having normal glucose tolerance and no medical history of diabetes mellitus were recruited as subjects. The subjects were given 50g available carbohydrate portions of the test meals and glucose (repeated three times) as the reference food after 10 – 12 h overnight fast on separate occasions. Blood glucose samples were collected at 0, 15, 30, 45, 60, 90 and 120 minutes after ingesting test meals or reference food. Incremental area under the blood glucose responses curve (IAUC) had been obtained through finger prick blood samples. Blood glucose was estimated by glucose oxidase method using an automatic glucose analyzer. Glycemic response (GR) and GI of the test foods were determined as a percentage of IAUC of test food item against mean of IAUC of glucose. The current study showed that the GI of TT was the highest (74 ± 6.4), followed by NL (66 ± 5.0) and the lowest was NGK (59 ± 4.4). There was a significant difference between the GI of TT and NGK ($p = 0.043$). TT was classified as high GI food whereas NL and NGK were categorized as intermediate GI based on established categorization. Additionally, the study also showed that high GI food, i.e. TT had not increased the blood glucose response (within 2h) above the normal level in obese individuals with a normal glucose tolerance status. Therefore, results from this study were able to enrich the international data on GI based on local foods.

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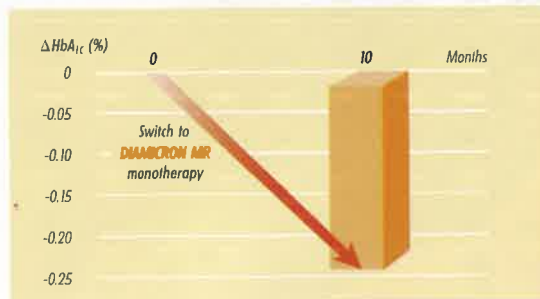
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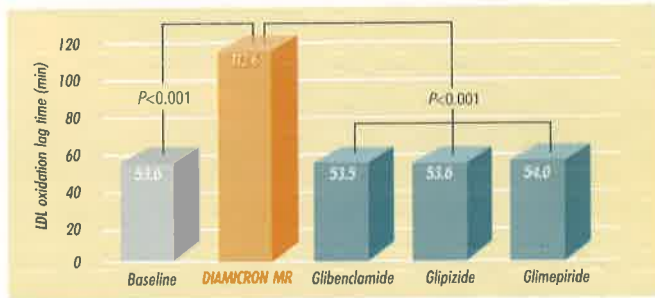
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1. Song DK, Ashcroft FM. *Br J Pharmacol*. 2001;133:193-199. 2. Gribble FM, Tucker SJ, Seino S, Ashcroft FM. *Diabetes*. 1998;47:1412-1418. 3. Gribble FM, Ashcroft FM. *Diabetologia*. 1999;42:845-848. 4. Drouin P and the Diamicron MR study group. *J Diabetes Complications*. 2000;14:185-191. 5. O'Brien RC, Luo M, Balazs N, Mercuri J. *J Diabetes Complications* 2000;14:201-206.

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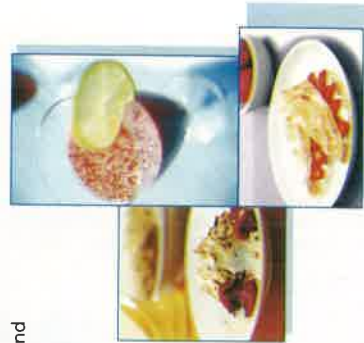
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Reference: 1. American Diabetes Association. *Diabetes* (September 1999): 1299.

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