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Original Article

Assessment of Patients' Perceptions about Modalities of Treatment in some Obesity Clinics (Slimming Centers) in the State of Kedah, Malaysia

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Abstract

Obesity is characterized by excess body fat. Obesity and the problems associated with being overweight are increasing at an alarming rate in Malaysia, due to the eating habits and sedentary lifestyle. The National Health and Morbidity Survey 2006 showed that two out of every five adults were either overweight or obese, and the number of obese adults had more than tripled over a decade. About 38% of youngsters aged 12 to 18 were overweight. Slimming centers and weight loss clinics have mushroomed in Malaysia due to the high obesity incidence rates. Our study focused on obese patients' perception towards benefits and effectiveness of slimming programs in the slimming centers. The study was conducted from February 2012 to April 2012. The highest incidence of obesity was in the age range 51 – 60 years (20.76%) and the lowest in the age range 11 – 20 years (3.77%). The mean body weight and BMI were 81 kgs and 64.36 respectively. The average BMI was 64.36. The slimming centers used three modalities (exercise, diet and medications) – either in single mode or in combination. Of the 53 cases, 3.78% reported using exercise exclusively, another 3.78% used medications solely and 1.89% relied on medication alone. 58.5% underwent a combination of exercise and diet; 11.3% were under the diet and medication regimen; while, 18.87% were undergoing treatment with a combination of exercise, diet and medication. 90.57% were satisfied with their decision to join the weight management program and were motivated to continue. 86.79% were satisfied with the outcome of the program.

Keywords: Obesity, (BMI), Slimming centers

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1. Introduction

Obesity is a complex, multifactorial condition characterized by excess body fat. It must be viewed as a chronic disorder that essentially requires perpetual care, support and follow-up. Obesity is associated with many other diseases, and it warrants recognition by health-care providers. Generally, men with >25% body fat and women with >35% body fat are considered obese [1]. Body mass index (BMI), a measurement which compares weight and height, defines people as overweight (pre-obese) if their BMI is between 25 and 30 kg/m2, and obese when it is greater than 30 kg/m2. The body mass index (BMI), also known as the Quetelet index, is used far more commonly than body fat percentage to define obesity. In general, BMI is closely correlated with the degree of body fat in most settings; however, this correlation is weaker at low BMI.

BMI = weight/height2, with weight being in kilograms and height being in meters (the weight in pounds X 0.703/height in inches^2).

The body fat percentage can be indirectly estimated by using the Deurenberg equation, as follows: body fat percentage = 1.2(BMI) + 0.23(age) - 10.8(sex) - 5.4, with age being in years and sex being designated as 1 for males and 0 for females. This equation has a standard error of 4% and accounts for approximately 80% of the variation in body fat [2].

Table 1: Classification of overweight in adults according to BMI [3]

Classification	**BMI (kg/m^2)**	**Risk of co-morbidities**
Underweight	<18.5	Low
Normal range	18.5-24.9	Average
Overweight	> 25.0	
Pre-obese	25.0-29.9	Increased
Obese class I	30.0-34.9	Moderate
Obese class II	35.0-39.9	Severe
Obese class III	>40.0	Very severe

Obesity occurs when a person consumes more calories than he or she burns. For many people this is due to eating too much and exercising too little. Other factors that also play a role in obesity include: age, gender, genetics, environmental factors, physical activity, psychological factors, illness and medications, among others [4].

Slimming: According to the Collins' English dictionary, slimming is the 'process of or concern with becoming slim or slimmer as by losing weight or as a modifier' [5].

Weight loss: Weight loss is a decrease in body weight resulting from either voluntary (diet, exercise) or involuntary (illness) circumstances. Most instances of weight loss arise due to the loss of body fat.

Weight Loss is a task that requires a conscious, intentional effort. In other words, calorie charts, scales, diet sheets and good intentions are often not adequate tools to regulate body weight over a lifetime. If weight regulation is going to be successful, it must take place over a long period of time and it must allow the body to adjust to the new calorie requirements and intake. The regulation of appetite and metabolism is the responsibility of automatic programs built into your body. As weight loss research progresses, modern diet pills are also becoming more efficient than ever before. One interesting development is a new pill, named Solidax ADX, developed by a US company. This new product suppresses appetite and increases the metabolic rate without having side effects [6].

Malaysia is a multi racial country consisting of Malays, Chinese, Indians and numerous indigenous people. Obesity and the problems associated with being overweight are increasing at an alarming rate. This can be put down to the core issue of the eating habits and sedentary lifestyle. This problem has been brewing for many years. In the year 2010, the national vernacular 'The Star' published the following article; More Malaysians are keeping awake till late to indulge in what is becoming a top national pastime – tucking in at 24-hour eating joints. Take a look at the goings-on at mamak shops close to and way past midnight. These shops have sprouted up all over the country to satisfy the cravings of Malaysians who are gorging on calorie-packed late night meals with hardly a care – and getting obese in the process. Statistics show that the prevalence of obesity among Malaysian adults increased by a staggering 250% over a 10-year period from 1996 while the number of overweight has increased by 70%. The National Health and Morbidity Survey in 2006 showed that two out of every five adults or 43%, were either overweight or obese and an alarming situation where the number of obese adults had more than tripled over a decade, from 4% in 1996 to 14% in 2006. Besides that, about 38% of youngsters aged between 12 and 18 were classified as overweight.

A recent survey involving 10,000 students showed that 24% of those aged between six and 12 were either overweight or obese. According to statistics, 14.9% and 43% of Malaysians aged above 30 suffer from diabetes and hypertension respectively, with 20.7% of adults over 18 suffering from high cholesterol. Malaysian Council for Obesity Prevention (MCOM) President Mr. Jong Koi Chong echoed the minister's concerns, saying the unhealthy eating trend was becoming a major problem – "Our metabolic rate is very low at night making it easy for fat to accumulate in the body."Most 24-hour

restaurants serve food that is high in fat, calories and cholesterol. Sadly, more of our young are picking up bad eating habits from adults,'' he added [7].

The Clinical Research wing of the MoH, Malaysia published this online article – 'The obesity rate in Malaysia is very alarming. 30% of the population is overweight and an additional 30% of the population is obese. These figures are very high and place Malaysia at number six in Asia in terms of obesity." Importantly, Health Minister of Malaysia in an interview for the Pharma Focus Reports 2011' [8].

As a result of industrialisation, urbanisation and economic stability in Malaysia, significant changes in diet and lifestyle have occurred. This has had a dramatic impact on the health of the population as evidenced from the increased prevalence of obesity and chronic non-communicable diseases. Malaysia is thus entering a new era of public health where nutrition-related issues will become ever more prominent. Tim Gill et al (2006) found that the ethnically diverse countries of Singapore and Malaysia had the highest levels of overweight and obesity within the region. Surveys of ethnic variation within both countries showed that subjects of Malay ethnic origin had significantly higher body weights than those of Chinese or Indian background. Comparisons of the weight status of urban and rural populations consistently reveal significantly lower levels of overweight and obesity in rural areas [9]

Slimming centers and weight loss clinics have mushroomed in Malaysia due to the high incidence rates of obesity. In Malaysia, the most popular slimming centers available are Slimming sanctuary, Mayfair, Slim palace etc.

The treatments (medications and otherwise) employed in the slimming centres can be basically classified into:

A) Non-pharmacologic therapy: behavioral modification, diet and surgery

B) Pharmacological therapy: Orlistat (Xenical), Sibutramine, Phendimetrazine, Phentermine, Fluoxetine (Prozac) and Sertraline (Zoloft) [10].

Patient Perception: Patient perception is 'a type of outcomes measure related to how the patient feels after treatment' [11]. Our research mainly focuses on the perception of the obese patients who are patrons of the slimming centers towards the benefits of slimming and effectiveness of the treatment available in the slimming centers.

Overweight patient will normally face the following problems:

Social: lack of enthusiasm for socializing; lack the desire to be social due to real or perceived prejudice in the community against overweight people.

At Workplace: Some employers have to make people with considerable weight problems redundant due to health and safety risks. Others discriminate when recruiting staff or considering candidates for promotion.

Physical Discomfort: experience fatigue, shortness of breath, joint pain etc [12]. Our study was essentially a survey focusing on the clients (patients) who availed the services of slimming centers in Sungai Petani. Our aim was to analyze if the slimming centers modalities of treatment produced satisfaction among the clients, and if this could improve their QOL (Quality of Life).

The major objectives of study are:

1) To assess the various modalities of treatment employed by various slimming centers in Sungai Petani, Malaysia.

2) To assess patients' (clients') perception towards the slimming courses and the subsequent outcomes.

Obesity: Overview

Recent study conducted by ching et al (13) explore the perception of, feelings and attitudes toward overweight or obesity, and the perceived barriers to weight loss among native adults from lower socio-economic background. A total of six gender- and ethnic-specific focus groups consisted of 38 overweight and obese purposefully and criterion selected adults (21 women and 17 men), participated in this study. An unstructured discussion guide based on the study objectives were used for the focus groups. The results showed that some participants perceived themselves as ugly, felt ashamed of their body size and were frustrated because they did not desire to be overweight. Due to their excess weight, most also expressed they were less effective in their work performances. Although some participants had negative attitudes toward themselves because of excess weight, this appeared to link to self stigmatization rather than anti-obesity discrimination. The participants remained in the Pre-contemplation stage of losing weight probably because of perceived barriers such as difficulty to resist eating and previous failed attempts to lose weight. Importantly, this study provided some evidence that individuals in the Pre-contemplation stage were unable to take action to lose weight, even if effective strategies were suggested [13].

Sherina M. Sidik et al (2009) (14) conducted a study to determine the prevalence of obesity among adult women in Selangor and to determine factors associated with obesity among these women. This community based cross sectional study was conducted in Selangor in January 2004. Multi stage stratified proportionate to size sampling method was used. Women aged 20–59 years old were included in this study. Data was collected using a questionnaire-guided interview method. The questionnaire consisted of questions on socio-demographic (age, ethnicity, religion, education level, occupation, monthly income, marital status), Obstetric & Gynaecology history, body mass index (BMI), and the Patient Health Questionnaire (PHQ-9). Out of 1032 women, 972 agreed to participate in this study, giving a response rate of 94.2%. The mean age was 37.91 ± 10.91. The prevalence of obesity among the respondents was 16.7% (mean = 1.83 ± 0.373). Obesity was found to be significantly associated with age (p = 0.013), ethnicity (p = 0.001), religion (p = 0.002), schooling (p = 0.020), educational level (p = 0.016), marital status (p = 0.001) and the history of suffering a miscarriage within the past 6 months (p =0.023). They concluded that 'The prevalence of obesity among adult women in this study was high. This problem needs to be emphasized as the prevalence of obesity keeps increasing, and will continue to worsen unless appropriate preventive measures are taken' [14].

Azmi MY et al (2009) reviewed the obesity rates between Malaysia and the WHO (2006) report. They reported that the overall obesity rate for Malaysian adults aged 18-59 years was below those for the developed and industrialized countries, particularly the United States (29.50%) (Centre for Disease Control, 2006) and Australia (15.10%). However, the Malaysian figures were well above those for Asian countries like Singapore (6.90%) and China (2.9%). The obesity problem is most serious among the poor, rural Malay women aged above 30 years particularly those in the states of Johor, Negeri Sembilan and Melaka. Overweight, on the other hand, seems to be more serious among the Indian and Malay men particularly those who are more than 30 years old and with lower education in all the states irrespective of strata, household income and occupation. Meanwhile, obesity and the issue of overweight continue to be a problem among the minority groups and the Indians. These findings indicate that Malaysian adults aged 18-59 years have a serious and escalating weight problem that will impede the health of the nation. The nation's most economically productive population group is still experiencing the twin facets of malnutrition which could derail national progress as it spirals towards 2020 and its vision of attaining a developed nation status [15].

Gilbert P. August et al (2008) reported that 'An increased BMI is related to morbidity and mortality in adults, even if there is imprecision as to the relationship of BMI values to body fat content. Following its widespread use in adults, BMI is now accepted as the standard in children. However, the use of BMI in children is more complex than in adults. The BMI standard percentile distribution changes with an individual's age, sex, and, in some populations, ethnicity—thus limiting the utility of the international standard BMI charts for age. Although not ideal, the BMI is the internationally recognized standard for the definition of overweight and obesity, and the CDC standard curves are the most readily available standards for American children. The Task Force elected not to recommend another standard without higher quality evidence' [16].

Lekhraj Rampal et al (2007) studied the prevalence of obesity among the various ethnic communities in Malaysia. Results in their study showed that other races such as Orang Asli, Eurasians and Sikhs had the highest prevalence of obesity followed by Malays, Indians and Chinese. Further analysis revealed that there was significant association of obesity between Malay and Chinese (p = 0.000, OR = 3.13, 95% CI = 1.72–5.70), Indian and Chinese (p= 0.000, OR = 0.33, 95% CI = 0.17–0.62), and other races and Chinese (p = 0.049, OR = 0.09, 95% CI = 0.99). There was also significant association between obesity and religion (p = 0.002), where other religions had the highest prevalence of obesity followed by Muslims, Hindus, Christians and Buddhist. This finding is supported by Malaysia's National Health and Morbidity Survey 2 (1996– 1997) which found that obesity was significantly associated with ethnicity. However, their findings showed that Indians had the highest prevalence of obesity followed by Malays, other indigenous and lastly Chinese [17].

Ministry of Health Malaysia (2006) The Malaysian non-communicable disease surveillance of 2005/2006 reported that 16.3% of Malaysian adults aged 25-64 years were obese, representing a four-fold increase in the prevalence of obesity in 10 years (4.4% in 1996, Malaysia Ministry of Health [MOH]), and an approximate two-fold increase in overweight (from 16.6% to 30% in 1996 and 2006, respectively).

In response to this situation, the "Guideline for prevention of obesity in Malaysia" was jointly drawn up by the Malaysian Association for Obesity Study (MASO), MOH, Malaysian Nutrition Association, Malaysian Dieticians' Association and others in 20042 to guide health care workers [18].

Kee CC et al (2006) studied the magnitude and socio-demographic profile of Abdominal Obesity (AO) among Malaysian adults at the national level in relation to the socio-economic factors and demographic characteristics of 33,465 eligible individuals 18 years and above. AO of adults aged 18 years and above was determined based on the waist circumference as part of the nutritional status assessment. Waist circumference was measured in 32,900 (98.3%) individuals. The prevalence of AO was assessed using the cut-off points recommended by World Health Organization. The mean waist circumference in men and women was 84.0cm [95% confidence interval (95% CI): 83.8, 84.3] and 80.3cm (95% CI: 80.1, 80.6) respectively. The national prevalence of AO was 17.4% (95% CI: 16.9, 17.9). The identified risks of AO were women (OR: 4.2, 95% CI: 3.8, 4.6), aged 50-59 years (OR: 5.6, 95% CI: 4.0, 7.7), Indians (OR: 3.0, 95% CI: 2.4, 3.8), housewives (OR: 1.4, 95% CI: 1.1, 1.7), subjects with primary education (OR: 1.3, 95% CI: 1.1, 1.5) and ever married (OR: 1.4, 95% CI: 1.2, 1.6). Being the largest population-based study on AO among Malaysians, these findings have important public health implications. There is an urgent need to revise public health policies and programmes aimed at prevention of abdominal obesity especially in the groups at risk [19].

Sumarni Mohammed Ghazali et al (2005) conducted a study to determine the prevalence of obesity in schoolchildren in the fifth grade of elementary school (10-12 years old) in the district of Kuala Selangor. Ten schools of which five are in urban and five in rural areas were selected, consisting of 699 eleven year old school children from the three major ethnic groups. Using international cut-off points for obesity, they reported an overall prevalence of obesity of 7.2%. Prevalence of obesity in urban children was 7.2% whereas in rural children it was 7.0 %. Analysed by gender, there were 8.9% obese boys and 5.3% obese girls. Among the 3 major ethnic groups, the Malays had the highest prevalence of obesity at 9.3% followed by the Chinese with 6.6% while among Indians 3.0%. The data obtained from this study suggested that obesity in Kuala Selangor children is a cause for concern in urban and rural areas [20].

Asima Malik et al (2001) conducted a study to find out the effect of restriction diet on lipid profile of 50 obese subjects of both genders in the age range 20 - 50 attending city slimming center. They observed a marked change in lipid profile of obese subjects. It was also concluded that although these slimming centers play a significant role in weight and lipid profile reduction but obese subject tend to regain lost weight within 6-8 months. It may be explained that diet regimen recommended by the slimming centers may not be maintained in the long run suggesting more studies to maintain the weight and level of lipid profile in obese subjects. The diet introduced in a weight reducing program contained low fat and carbohydrate and high protein with vitamin and mineral supplement. After two weeks, moderate exercise was also added. Our study observed changes in lipid profile in male subjects during one month observation. It was also seen that level of total cholesterol and LDL-C was significantly decreased in both sexes. They concluded that the 'Diet modified to restrict carbohydrate and fat intake with mild to moderate exercise recommended by city slimming centre usually results in decrease of total calorie intake which itself has a favorable effect on plasma lipid level. Although these slimming centers play a role in weight reduction and decrease the lipid profile. But it was observed that people tend to regain lost weight within 6-8 months. Reason may be that diet regimen of slimming centers are one that cannot be maintained in the long term. Hence, further research is needed to maintain the weight and level of lipid profile in obese subjects' [21].

2. Material and Methods

Study design and population

The prospective–cum-retrospective survey was started after getting official consents to collect the data from customers (clients) of various slimming centers in Kedah. The study was conducted for a period of three months from February 2012 to April 2012. The study included patients of various slimming centers/ clinics in Kedah. Data were collected from the cases (clients) utilizing a questionnaire data collection form (Annexure-1). The questionnaire included patient demographics, food habits, questions pertaining to the health status, the treatment modalities employed by the slimming centers, and the patients' overall perception of the slimming centers.

Inclusion criteria: All the clients who joined the slimming centre/ clinics and were undergoing treatment.

Exclusion criteria: All potential patients who came out only for consultation and were not undergoing the treatment program.

Data collection: Relevant data were obtained from the clients (cases) by means of a modified questionnaire. The informed consent was obtained prior to the questioning. Various facets of details were obtained by means of open and closed questions. The participants were assured that all details provided would remain confidential.

Parameters for evaluation: The parameters included patients' perception of obesity, their opinions about the treatment (drug, exercise, medication and diet plan) either single or combined modality; compliance to the treatment program and any improvement in QOL (physical activities, exercising, etc.) Besides this, patients' knowledge about the medications (if any) received during treatment were also looked into

Sequential Plan of Work

Stage I: Collecting literature-based evidences from the various sources (books, journals and the internet).

Stage II: Obtaining the necessary consent from the slimming centers identified, to utilize their facilities for the research.

Stage III: Collecting the data from the cases/patients/clients of the slimming centers, after obtaining their consent (Informed consent). This was done for a period of 1 month.

Stage IV: Analysis of all the data obtained, comparison with, and observing the trends with existing literature.

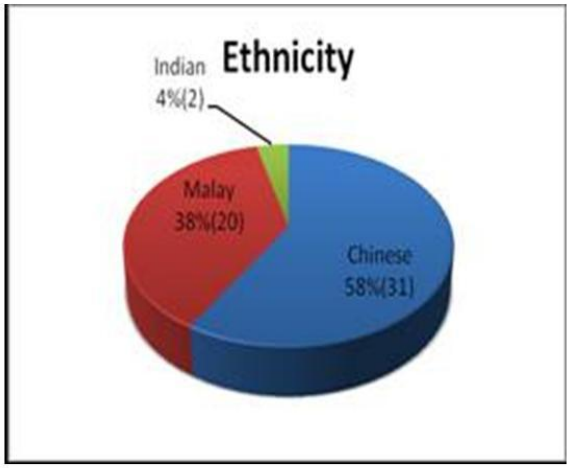
Subjects: Any customer (case), undergoing the slimming program in the slimming centers.

Sites: Slimming centers in Sungai Petani (Kedah state, Malaysia).

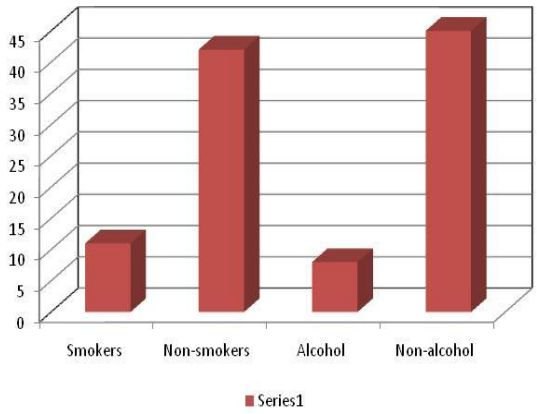
3. Results and Discussion

Age and Ethnicity: In our study, we found the highest incidences of obesity in the age range 51 – 60 (20.76% 11/53of cases) and the lowest in the age range 11 – 20 (3.77% 2/53 of cases). The oldest case was 59 years and the youngest 18 years old. This was similar to the Findings of the Malaysian Adult Nutrition Survey (MANS) 2009.[22] They reported that 'When compared with the obesity rates in the WHO (2006) report, the overall obesity rate for Malaysian adults aged 18-59 years was below those for the developed and industrialized countries, particularly the United States (29.50%) (Centre for Disease Control, 2006) and Australia (15.10%). However, the Malaysian figures were well above those for Asian countries like Singapore (6.90%) and China (2.9%). The obesity problem is most serious among the poor, rural Malay women aged above 30 years particularly those in the states of Johor, Negeri Sembilan and Melaka. Overweight, on the other hand, seems to be more serious among the Indian and Malay men particularly those who are more than 30 years old and with lower education in all the states irrespective of strata, household income and occupation. Meanwhile, obesity and the issue of overweight continue to be a problem among the minority groups and the Malaysian Indians. These findings indicate that Malaysian adults aged 18-59 years have a serious and escalating weight problem that will impede the health of the nation. The nation's most economically productive population group is still experiencing the twin facets of malnutrition which could derail national progress as it spirals towards 2020 and its vision of attaining a developed nation status.

Another study which augments our statement is a study conducted by Tim Hill et al (2006). They reported that the ethnically diverse



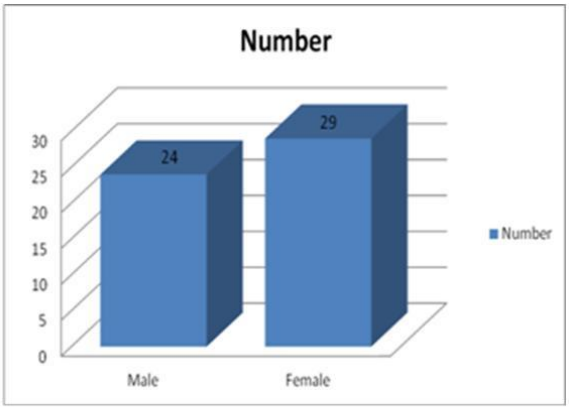
Ethnicity	Chinese	Malay	Indian
Number	31	20	2



Smokers	Non-smokers	Alcohol	Non-alcohol
11	42	8	45

countries of Singapore and Malaysia had the highest levels of overweight and obesity within the region. Surveys of ethnic variation within both countries showed that subjects of Malay ethnic origin had significantly higher body weights than those of Chinese or Indian background. Comparisons of the weight status of urban and rural populations consistently reveal significantly lower levels of overweight and obesity in rural areas. [9]

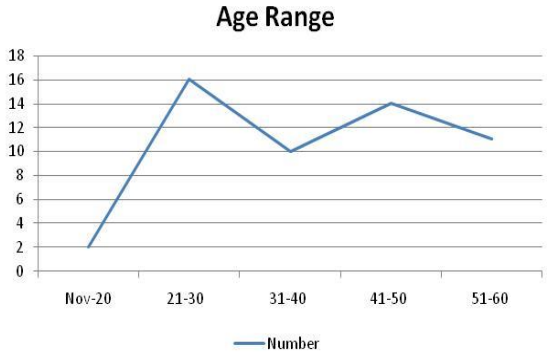
Gender: From our data, we observed that the number of females (29) was slightly higher than the males (24). But, the difference was not significant. Grujic V et al (2009) studied the association between obesity and various socio-economic factors. They found out that the prevalence of overweight was higher in men (41.1%) than in women (30.9%) ($p < 0.001$) while obesity was higher in women (23.10%) as compared to men (20.2%) ($p = 0.035$). For both sexes, overweight rates were highest at the age 60-69 (men 44.8% and women 39.1%) while obesity rates were peaked to men aged 50-59 (25.1%) and women aged 60-69 years (37.8%). Increasing ageing, males, rural population, single examinees, lower educational level, improved income, examinees that never/sometimes have breakfast and frequently watch TV were associated with obesity. [23] This reinforced our view that obesity and the issue of overweight affects both the sexes, and it does vary from country to country.



Gender	Male	Female
Number	24	29

Body Weight and BMI: The overall mean body weight and BMI were 81 kgs and 64.36 respectively. The BMI covered a wide spectrum 25 – 65.5. The average BMI for 53 subjects is 64.36. This extended from the category 'Pre-obese' to 'Obesity Class-III' as per the WHO classification.[24] Comparing the mean BMI reported in NHMS II (Fatimah et al., 1997), the overall mean BMI for Malaysians aged 18 - 59 years has increased to about 45.25. Overweight was highest among the Chinese. [25] Raised BMI also increases the risks of cancer of the breast, colon, prostrate, endometrium, kidney and gallbladder. Chronic overweight and obesity contribute significantly to osteoarthritis, a major cause of disability in adults. Although obesity should be considered a disease in its own right, it is also one of the key risk factors for other chronic diseases together with smoking, high blood pressure and high blood cholesterol. In the analyses carried out for World Health Report 2002, approximately 58% of diabetes and 21% of ischaemic heart disease and 8-42% of certain cancers globally were attributable to a BMI above 21 kg/m2. [26] The overweight prevalence indicates that the overweight problem in Malaysia is almost as serious as that for the developed countries as reported in the 1999 - 2002 National Health and Nutrition Examination Survey (NHANES) and WHO (2006). [27]

Social History: 13 cases (24.5%) reported a sedentary



Age Range (Yrs)	11-20	21-30	31-40	41-50	51-60
Number	2	16	10	14	11

life style pattern. While, 33 cases (62.26%) led moderately active lifestyles and 7 cases (13.2%) claimed their lifestyles were very active.

According to Muhammad Umair Mushtaq et.al (2011) report, a very high proportion (84% for males and 91.2% for females) of Saudi adolescents spend more than 2hours on screen time daily and almost half of the males and three-quarters of the females did not meet daily physical activity guidelines. The majority of adolescents did not have a daily intake of breakfast, fruit, vegetables and milk. Females were significantly ($p < 0.05$) more sedentary, much less physically active, especially with vigorous physical activity, and there were fewer days per week when they consumed breakfast, fruit, milk and dairy products, sugar-sweetened drinks, fast foods and energy drinks than did males. [28]

According to the WHO, 'A sedentary lifestyle plays a significant role in obesity. Worldwide, there has been a large shift towards less physically demanding work, and currently at least 60% of the world's population gets insufficient exercise. This is primarily due to increasing use of mechanized transportation and a greater prevalence of labor-saving technology in the home. In children, there appear to be declines in levels of physical activity due to less walking and physical education. World trends in active leisure time physical activity are less clear. The World Health Organization indicates people worldwide are taking up less active recreational pursuits, while a study from Finland found an increase and a study from the United States found leisure-time physical activity has not changed significantly.'[26]

The number of smokers and alcoholics were 11 and 8 respectively. With regard to the few smokers in the study, our finding was partially eluded by an earlier study done by Arnaud Chiolero et al (2008). They critically evaluated the relations among smoking, body weight, body fat distribution, and insulin resistance as reported in the literatures. They concluded that, in the short term, nicotine increases energy expenditure and could reduce appetite, which may explain why smokers tend to have lower body weight than nonsmokers, and why smoking cessation is frequently followed by weight gain. But, we could not ascertain any correlation between smoking and the patients in the slimming centres in our study. The reason being, heavy smokers are also highly prone to obesity. This was another finding by Arnaud Chiolero et al. They found that heavy smokers tend to have greater body weight than do light smokers or nonsmokers, which likely reflects a clustering of risky behaviors (eg, low degree of physical activity, poor diet, and smoking) that is conducive to weight gain. Other factors, such as weight cycling, could also be involved. In addition, smoking increases insulin resistance and is associated with central fat accumulation. As a result, smoking increases the risk of metabolic syndrome and diabetes, and these factors increase risk of cardiovascular disease. In the context of the worldwide obesity epidemic and a high prevalence of smoking, the greater risk of (central) obesity and insulin resistance among smokers is a matter of major concern [29].

Health Status: In 49 cases (92.45%) felt that their health status was better (ranging from 'much better' to 'much worse'). This could be due to the weight loss, which enabled them to perform better in day-day manual and physical activities, and hence, the feeling that their health status was better.

Hereditary Obesity: The incidences of hereditary obesity were high (32 cases, 60.38%). Mirmian et al (2002) conducted an observational analytical cross-sectional survey among 117 healthy families comprising 474 subjects including 240 offspring (3 25 y old) in Tehran. They wanted to clarify the hypothesis that parent's dietary intakes are associated with their offspring's body mass index. Weight and height were measured by a standard protocol and body mass index (kg/m^2) was calculated. Dietary intakes were assessed by means of a 2 day dietary recall questionnaire. The prevalence of overweight was 11.8% in offspring of normal-weight parents, 19.0% in offspring of overweight fathers and normal-weight mothers, 25.4% in offspring of overweight mothers and normal-weight fathers and 40.8% in offspring with both parents overweight. The offsprings' overweight was significantly and independently associated with high-energy intake of both parents (odds ratio; 95% CI 2.7; 1.6.4.5). Adjusted for the sex of parents, the chances of offspring being overweight were higher in overweight (3.8; 1.5.9.2) and high-energy-intake mothers (2.6; 1.2 5.6) and high-energy-intake fathers (2.0; 1.1.3.9) as compared with children of normal-weight parents. High fat intake of husbands was an independent risk factor increasing the chances of their wives being overweight (2.1; 1.5.3.6) and vice versa (1.8; 1.2.2.8). They concluded that the observed familial obesity pattern was shown to be associated with the familial dietary intakes. Hence, familial intervention seems essential to stop the accelerated rise in the

prevalence of overweight and obesity in our community. [30]

Motivating friends etc.: 36 cases (67.92%) reported that their joining the slimming program in the obesity clinics motivated their friends, neighbors and relatives to join the program too.

Weight Loss- a Simple Task: 29 cases stated that losing weight was a simple task after joining the weight management program in the slimming centers.

Treatment Modality: The slimming centers generally used three modalities (exercise, diet and medications) – either in single mode or in combination. Of the 53 cases, 3.78% (2 cases) reported using exercise exclusively, another 3.78% (2 cases) used medications solely and 1.89% (1 case) relied on medication alone. 58.5% (31 cases) underwent a combination of exercise and diet; 11.3% (6 cases) were under the diet and medication regimen; while, 18.87% (10 cases) were undergoing treatment with a combination of exercise, diet and medication.

These modalities have a tremendous impact, not only in weight loss, but also in other conditions. Robert Ross et al (2000) conducted a randomized, controlled trial to assess the impact of exercise and diet on weight loss in men. They reported that body weight decreased by 7.5 kg (8%) in both weight loss groups and did not change in the exercise without weight loss and control groups. Compared with controls, cardiovascular fitness (peak oxygen uptake) in the exercise groups improved by approximately 16% ($P < 0.01$). Although total fat decreased in both weight loss groups ($P < 0.001$), the average reduction was 1.3 kg (95% CI, 0.3 to 2.3 kg) greater in the exercise-induced weight loss group than in the diet-induced weight loss group ($P = 0.03$). Similar reductions in abdominal subcutaneous, visceral, and visceral fat–to–subcutaneous fat ratios were observed in the weight loss groups ($P < 0.001$). Abdominal and visceral fat also decreased in the exercise without weight loss group ($P = 0.001$). Plasma glucose and insulin values (fasting and oral glucose challenge) did not change in the treatment groups compared with controls ($P = 0.10$ for all comparisons). Average improvement in glucose disposal was similar in the diet-induced weight loss group (5.6 mg/kg skeletal muscle per minute) and in the exercise-induced weight loss group (7.2 mg/kg skeletal muscle per minute) ($P > 0.2$). However, these values were significantly greater than those in the control and exercise without weight loss groups ($P < 0.001$). They concluded that weight loss induced by increased daily physical activity without caloric restriction substantially reduces obesity (particularly abdominal obesity) and insulin resistance in men. Exercise without weight loss reduces abdominal fat and prevents further weight gain [31].

The slimming centers using medications as a modality (either in single or combination mode) did not reveal any details of the medication used, let alone the name. Therefore, we could not obtain more information in that aspect. The most commonly preferred medications are sibutramine, orlistat and hypolipidaemic agents. Philip James et al (2001) conducted a randomised, multi-centre trial involving 605 obese patients (body-mass index 30-45 kg/m2) for a 6-month period of weight loss with sibutramine (10 mg/day) and an individualized 600 kcal/day deficit program based on measured resting metabolic rates. 467 (77%) patients with more than 5% weight loss were then randomly assigned 10 mg/day sibutramine (n=352) or placebo (n=115) for a further 18 months. Sibutramine was increased up to 20 mg/day if weight regain occurred. The primary outcome measure was the number of patients at year 2 maintaining at least 80% of the weight lost between baseline and month 6. Secondary outcomes included changes in uric acid concentrations and glycaemic and lipid variables. Analysis was by intention to treat. 148 (42%) individuals in the sibutramine group and 58 (50%) in the placebo group dropped out. Of the 204 sibutramine-treated individuals who completed the trial, 89 (43%) maintained 80% or more of their original weight loss, compared with nine (16%) of the 57 individuals in the placebo group (odds ratio 4.64, $p<0.001$). Patients had substantial decreases over the first 6 months with respect to triglycerides, VLDL cholesterol, insulin, C peptide, and uric acid; these changes were sustained in the sibutramine group but not the placebo group. HDL cholesterol concentrations rose substantially in the second year: overall increases were 20.7% (sibutramine) and 11.7% (placebo, $p<0.001$). 20 (3%) patients were withdrawn because of increases in blood pressure; in the sibutramine group, systolic blood pressure rose from baseline to 2 years by 0.1 mmHg (SD 12.9), diastolic blood pressure by 2.3 mmHg (9.4), and pulse rate by 4.1 beats/min (11.9). This individualized management program achieved weight loss in 77% of obese patients and sustained weigh to loss in most patients continuing therapy for 2 years. [32]

Though these medications are highly efficient in terms of weight reduction, concerns do persist with regards to the safety profile, toxicity, and most importantly, the compliance by the patients.

Decision to join the weight management program: A massive proportion of the cases (48 cases; 90.57%) were satisfied with their decision to join the weight management program. They indicated that their weight loss motivated them to continue with the program.

Outcome of weight management programs: Yet again, a huge proportion of the cases (46 cases; 86.79%) were satisfied with the outcome of the weight management program.

The cases' (patients) response to the questions 2, 15, 17, 18 and 19 indicated that the obesity clinics did have a huge impact on reducing the weight of these patients. The various modalities employed by each centre is therefore, efficient in tackling this problem. However, the concern would be if these patients would be able to maintain their weight and continue with the exercise, diet and /or medication, once they are in another environment, i.e., their home.

According to Johanna C. Andersson and Andrew J. Walley, 'Our current environment is considered obesogenic because of the ready availability of cheap, calorie-rich foods, the increasing trend toward office working due to automation and computerization of manual jobs, the rise of leisure pastimes such as video games that require little or no physical effort, and the ubiquity of the Internet allowing activities that previously required some physical effort, such as shopping or social interaction, to occur through a computer[33].

Conclusion

In conclusion, the present study focused on the clients who enrolled in slimming, weight loss and management programs in a few slimming centers in Sungai Petani. We observed that the average BMI was very high (64.36%). This points to an alarming situation health-wise. The incidences of obesity and the proportion of people being over-weight are very high in Malaysia. This can be attributed to the booming economy and modern lifestyle, where fast foods are becoming the norm in almost every meal.

Slimming centers and 'weight loss clinics' are gradually mushrooming in most states in Malaysia. The treatment modalities offered in each centre varies (diet, medication and exercise). Some centers use only one modality while others used a combination of the stated modalities. Most cases adjudged their decision to enroll in the weight loss programs offered by these centers as the right one. Majority were satisfied with the outcomes of the programs, noticeably with the issue of weight loss in a short span of time (1 week). In fact, many believed that losing weight was easier after enrolling in the program, and were in for the long haul. The ordinal data in our study (patients' perception) reflected a growing satisfaction and enthusiasm to continue with the program.

Diet modified to restrict carbohydrate and fat intake with mild to moderate exercise recommended by city slimming centre usually results in decrease of total calorie intake which itself has a favorable effect on plasma lipid level. Although these slimming centers play a role in weight reduction and decrease the lipid profile. The usual scenario is that people tend to regain lost weight within 6-8 months. Reason may be that diet regimen of slimming centers are one that cannot be maintained in the long term. Hence, further research is needed to maintain the weight and level of lipid profile in obese subjects.

In future, the study can be extended with longer duration to ensure better follow-up. The study can also gradually extend to other centers in Kedah and eventually, Malaysia. In doing so, we can ascertain whether these slimming centers and 'weight loss clinics' are actually 'success-guaranteed' in tackling the issue of obesity.

Limitations of the Study

- The limited number of the samples (cases/clients /patients). This could be due to the fact that enrolling in the weight management program in slimming centers is a costly affair, even though the success rates with regards to weight loss are high.
- Unequal number of cases among the ethnic communities. Majority of the cases belonged to the Chinese community. This could be due to the afore-mentioned cause.
- The result reflects the scenario and outcomes with regard to patients' perception in only a few centers in Kedah state. This was because the owners and patrons of many other slimming centers that we approached were hesitant to reveal their modus operandi with regard to slimming, weight loss and weight management. Some centers did not grant us permission to procure data from them.

- The time frame was very less. More authentic data and results can be obtained if the research is carried out for a longer period of time (eg: 1 year), in order to establish the patients' compliance to the program.

Conflict of interest: None

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QUESTIONNAIRE FOR OBESITY

Name: _____ **Age**: _____ **Gender**: M/F **Weight**: **Height**: **BMI**:

1) Which kind of food habits that are you practicing? Non vage ☐ Vege ☐

If non-vege, which fast food(s) are you more prefer:

Potato chips ☐ Burger ☐ Sandwich ☐ Fried chicken ☐

Smoker: Y/N Alcohol: Y/N

2) Occupation: _____

Lifestyle: ☐ Sedentary: ☐ Moderate Active: ☐ Active

3) In general, how would you rate your health compared to the condition before treatment?

	Much better now than before treatment
	Somewhat better now than before treatment
	About the same
	Somewhat worse now than before treatment
	Much worse than before treatment

4) The following items are about activities you might do during a typical day. How would you describe your ability to perform these activities before and after undergoing treatment? If so, how much? (Mark each answer with an X).

ACTIVITIES	**Yes, Limited A Lot**		**Yes, Limited A Little**		**No, Not Limited At All**	
	Before	**After**	**Before**	**After**	**Before**	**After**
a. **Vigorous activities,** such as running, lifting heavy objects, participating in strenuous sports						

b. **Moderate activities,** such as moving a table, pushing a vacuum cleaner, bowling, or playing golf						
c. Lifting or carrying groceries						
d. Climbing **several** flights of stairs						
e. Climbing **one** flight of stairs						
f. Bending, kneeling or stooping						
g. Walking **more than a mile**						
h. Walking **several blocks**						
i. Walking **one block**						
j. Bathing or dressing yourself						

5) Do you have a habit of calculating calories before eating?

☐ Yes ☐ No

6) What was the age for the onset of obesity?

☐ Early teens (12-15) ☐ late teens (16-19) ☐ early adulthood (20-30)

☐ Mid (30-40) ☐ Above 40

7) How long have been coming to this centre for treatment?

8) What modalities of treatment are you receiving?

Exercise	
Medications	
Diet plan	

9) On a scale of 1-5, how would you rate the treatment?

	1	2	3	4	5

Exercise					
Medications					
Diet plan					

10) Have you been fully compliant with the treatment modalities once you go back home?

Excellent	Good	Fair	Poor	Very

11) How would you describe your compliance to the diet plan/ chart?

Excellent	Good	Normal	Poor	Worst

12) What is your opinion about the medications used in you treatment/course?

_____

13) Regarding the medication, do you know the

Particular	Y/N	If yes,	If no, why?
Name			
Dose& Frequency			
Mechanism of action			

14) How would you describe the counseling sessions?

Excellent	Good	Fair	Poor	Very poor

15) Does obesity or the incidence of overweight run in your family?

☐ Yes ☐ No

16) Has your experience in the obesity clinics inspired others to join weight management programs?

☐ Yes ☐ No

17) After undergoing the sessions, has your perception been altered with regards to

	1	2	3	4	5
Eating					
Exercise					

18) Do you think that losing weight is a simple task?

☐ Yes ☐ No