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Research paper



A Correlational Analysis of Social Factors with Obesity among Malay Obese People

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Abstract

This study examines the correlation between social factors and obesity among Malay obese people (age: 20-59 years old) in Terengganu, Malaysia. Comprised of cross-sectional research design, this study has been applied a convenience sampling technique. Clinical Practice Guidelines on Management of Obesity (2004) criteria was adopted < 27.49kg/m^2 to measure the body mass index. The number of participants were included in this study n = 150 (male = 80 & females = 70). Data is collected by using close-ended self-administrated questionnaire. SPSS version 21.0 was used for the data analysis. The results reveals that obesity is significantly correlated with feelings (low self-esteem), body image dissatisfaction, eating and dieting frequency (eating habits), frequency of exercise (physical inactivity), physical activity barriers, and media influence. Moreover, obesity has found insignificant with health knowledge, religious knowledge, religious practices and their relation with obesity. It is a pioneer study that has assessed the correlation of social factors and obesity among Malay obese adults in Terengganu, Malaysia. This study reports that majority of the social factors are significantly correlated with obesity. Therefore, interventional programs should be arranged by government based on the social factors in order to decrease the level of obesity in Terengganu, Malaysia.

Keywords: *obesity; level of obesity; Malay obese; social factors; Malaysia obesity.*

1. Introduction

The pervasiveness of obesity is an important issue and can be defined as the higher body fat accumulation in an individual's weight would increase the risk of numerous health issues like diabetes, heart attack, stroke, and blood pressure [1]. The proportion of overweight and obese people has been increased from 857 million in 1980 to 2.1 billion in 2013. Obesity has increased three times more from the last three decades across the world with higher level among females than its counterparts [2]. Moreover, World Health Organization (WHO) has declared the ratio of overweight is 39%, and for obesity it is 13% respectively, among adults aged 18 years and above [3]. The pervasiveness of obesity is an epidemic problem in several developing countries including Malaysia, where obesity pervasiveness ranked higher among all Asian countries.

From the findings of National Health and Morbidity Surveys (NHMS) carried out by Malaysian institute of public health, a rising trend of overweight and obesity was found among Malaysian adults aged 18 years and above: 29.1% (95%CI: 28.6–29.7) and 14.5% (95% CI: 13.6–14.5) [4], 29.4% (95% CI: 28.4–30.4) and 15.1% (95% CI: 14.3–15.9) [5], 30.0% (95% CI: 29.1–31.0) and 17.7% (95% CI: 16.9–18.5) respectively. Moreover, according to data of NHMS, 2011 [6], the ratio of obesity in Terengganu is 14.1% which is increasing day by day [6]. A recent study shows that the pervasiveness of obesity is increasing to be alarming with the ratio of 27.6% in Terengganu [7] and its pervasiveness is higher among Malay ethnics followed by Indians ethnics [6].

Further, some studies have indicated that social factors have a strong correlation with obesity among adult obese individuals. Malaysians are experiencing the issue of obesity as previously social factors have overlooked obesity among adult population. Literature has indicated the correlation between social factors with obesity among different societies with different set of samples [8-16]. Moreover, obesity is connected with many severe conditions including heart attack, hypertension, type 2 diabetes and stroke. Both modest and high weight gains are related to increase the risk of diseases; (e.g.) 11– 18 pounds of weight gain in an individual will increase the chances of type 2 diabetes two times more than the people who have not gained weight, while the individuals who gain 44 pounds or higher have four times more chance of risk to develop type 2 diabetes [17]. Obesity is likewise associated with higher rates of specific types of cancer. It is also an independent factor for coronary diseases such as heart problem, arthritis, etc. Obesity-related diseases are more likely to occur due to low socioeconomic status, along with the issue of drinking and smoking [18]. It considers the seventh leading cause for deaths in the US. Around 300,000 deaths are attributed to obesity every year, which is equivalent to the 400,000 deaths attributed to tobacco use [19].

Hence, the aim is to identify the correlation between social factors and obesity among Malay obese people living in Terengganu, Malaysia, as there is lack of information about social factors influencing obesity within country. The identification and the correlation of social factors with obesity are essential to reduce the morbidity and mortality rates of cardiovascular diseases.

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2. Theoretical Framework

Several frameworks have addressed one variable only, (for example, biogenetics) that is related to obesity and does not address others (i.e. social or environmental). However, the Socio-Ecological theoretical framework is implacable and adapted for this research since it explains the complexities of obesity at different levels affecting in an individual's life: intrapersonal, interpersonal, community, and societal [20]. All variables should be considered in one framework, so that the findings may reflect the diversity in several countries around the world, not only specified to one community or country [21]. Moreover, behavior has been explained as influential itself and also can be influenced at different levels that may affect the health-related behaviors [22]. Therefore, the purpose of this study is to see the correlation of social factors at intrapersonal level and societal level (like media). Examining the correlations within each level can give a proper understanding of the problem among the population [23].

3. Methodology

A cross-sectional study is conducted to assess the correlation between obesity and social factors (i.e.: feelings (low self-esteem), body image dissatisfaction, frequency of eating and dieting (eating habits), dieting behavior, health knowledge, frequency of exercise (physical inactivity), physical activity barriers, media influence, religious knowledge, religious practices, and their relation with obesity) among Malay obese adults in Terengganu. The convenience sampling method has been applied to recruit the 150 Malay ethnic adults aged (20 -59) of both genders.

The Clinical Practice Guidelines on Management of Obesity criteria has been utilized to calculate the body mass index [24]. BMI is defined as equal weight in kilograms divided by height in meter squared (BMI = kg/m^2). The criteria that has been followed: underweight (BMI < 18.5kg/m^2), normal (BMI 18.5– 22.9kg/m^2), overweight (BMI 23.00-27.49kg/m^2), obese (BMI > 27.49kg/m^2). Weight and height are measured by a trained nurse using 'Health Scale' taken from UniSZA's clinic.

The questionnaire is consisted of 12 sections including the demographic profile adapted from literature and studies [25-30]. The questionnaire is used in English language, and also translated into the Malay language with validation. Data is analyzed by using SPSS version 21.0. Statistical tests Chi-Square and Spearman correlation are used based on the items to examine the relationships between the total score of the results of social factors and obesity. To check the correlation among variables, the significance level has been set at $p < 0.05$.

4. Results and Analysis

First of all, the results shown the basic demographic profile of total respondents (n = 150) in Table 1. Frequency analysis was used to see the ratio among participants according to their demographic profile in the present study. The respondent distribution of the 'sex' category shown that out of total 150 respondents' males were slightly higher in percentage (53.3%), while females were 46.7%. For the 'age' category, the data indicates the respondents age ranges, were 20-29, frequencies of 46 with percentage (30.7%), ages 30-39, frequencies of 70 with percentage (46.7%), ages 40-49 frequencies of 19 with percentage (12.7%) and ages 50-59, frequencies of 15 with percentage (10.0%) out of 150 participants respectively. For, 'marital status' category, this study indicates the frequencies of respondents never married (being single) are 42 with 28.0% and ever married (being married, divorced and widow) are 108 with 72.0%.

Further, the results indicate 'job status' of respondents, the frequency of 128 with (85.3%) was employed and frequency of 22 with (14.7%) was unemployed out of 150 respondents. In addition, the study reports the data of income level, where frequencies and ratios explained that participants have less than 3000RM, frequency is 91 with (60.7%), between 3001-6000RM, frequency is 47 with (31.3%) and above 6000RM, frequency is 12 with (8.0%) out of 150. Last category was education level; analysis has showed the statistical distribution of education categories of the respondents. The frequency of respondents with low education (UPSR, PMR, SPM, SPTM) category is 61 with (40.7%), certificate and diploma, 27 with (18.0%), A-level and graduation, 46 with (30.7%) and Masters and above are 16 with (10.7%) out of 150 respondents.

Table 1: Socio-demographic profile of the participants

Profile of Participants	N	%
Sex		
Male	80	53.3
Female	70	46.7
Age		
20-29	46	30.7
30-39	70	46.7
40-49	19	12.7
50-59	15	10.0
Marital Status		
Never Married	42	28.0
Ever Married	108	72.0
Job Status		
Yes	128	85.3
No	22	14.7
Income Level		
Less than 3000	91	60.7
3001-6000	47	31.3
More than 6000	12	8.0
Educational Level		
Low education (UPSR, PMR, SPM, SPTM)	61	40.7
Certificate and Diploma	27	18.0
A-level and Graduation	46	30.7
Masters and above	16	10.7

To check the correlation between social factors and obesity, Chi-square test has been applied for nominal items of questionnaire**.** The Table 2 shows the findings of body image dissatisfaction and obesity. There were asked fived questions to evaluate the correlation between two variables from respondents. The findings indicate that obesity had significant positive correlation with the question 'do you think you have an ideal weight?'. Chi-square shows the value =131.406[a,] degree of freedom =183 and Asymp. Sig. (2-sided) = .000 in the given Table 2. Further, statistical test Chi-square found a significant positive correlation between obesity and 'I think, I am overweight' with $p < 0.05$, also describes the value and degree of freedom. The item 'have someone told you that you are overweight?' was also significantly positive associated with $p < 0.05$. There was no significant correlation found between 'if you could choose your ideal weight, that would it be?', and 'who told you that you are overweight' and obesity.

Table 2: Correlation of body image dissatisfaction and obesity

Items	Counts	Pearson Chi-Square		
		Value	df	Asymp. Sig. (2-Sided)
Do you think you have an ideal weight?	Yes = 73 No = 77 Total = 150	131.406[a]	82	.000
If you could choose your ideal weight that would it be?	More than I weight now = 4 Less than I weight now = 142 My weigh now is ideal weight = 4 Total = 150	177.905[a]	164	.217
I think, I am overweight	Yes = 145 No = 5 Total = 150	106.034[a]	82	.038
Have someone told you that you are overweight?	Yes = 147 No = 3 Total = 150	115.986[a]	82	.008

Who told you that you are overweight	Doctor = 40 Practice/clinic nurse = 2 Dietician = 12 Close friends/friends = 45 Family member/s = 50 Total = 149	339.444[a]	324	.267

There were asked 15 questions to evaluate the correlation of eating and dieting frequency (eating habits) and obesity. Table 3 shows the correlation of asked items such as "how many times have tried to lose weight by dieting in last 6 months?" ($p < 0.05$) including the value 403.398[a] and degree of freedom, and how many times you eat in one day? ($p < 0.05$). Further, the findings has reported that, 'are you on diet?', 'what type of diet are you in?', 'have you tried to lose weight by dieting?', 'do you ever eat even though you don't feel hungry?', 'how often you hang around with your friends for eating at your favorite restaurant in a week?', 'how often do you eat take out (pizza, KFC, McDonalds, etc.)?', 'what time you take your first meal?', 'what time you take last meal?', 'do you ever "comfort eating"?', 'do you ever "comfort eating"?', 'do you ever count your calorie intake as a way to control your weight?', 'do you tend to overeat when you feel stressed?', 'do you eat breakfast?', 'do you feel that dieting is hard for you?' were found insignificant with obesity.

Table 3: Correlation of eating and dieting frequency (eating habits) and obesity

Items	Count	Pearson Chi-Square		
		Value	df	Asymp. Sig. (2-Sided)
Are you on diet?	Yes = 98 No = 52 Total = 150	83.525[a]	82	.432
What type of diet are you in?	Vegan diet (practice of abstaining from the use of animal products = Vegetarian diet = 2 Cholesterol lowering diet = 19 Slimming diet decided for yourself = 38 Slimming diet prescribed by the Doctor = 7 Others = 7 Total = 150	301.068[a]	265	.063
Have you tried to lose weight by dieting?	Yes = 38 No = 112 Total = 150	83.615[a]	82	.430
How many times have tried to lose weight by dieting in last 6 months?	Never = 16 1-3 times = 37 4-6 times = 31 7-10 times = 34 more than 10 times = 32 Total = 150	403.398[a]	328	.003
Do you ever eat even though you don't feel hungry?	Yes = 61 No = 89 Total = 150	86.635[a]	82	.342
How many times you eat in one day?	Less than 3 times = 15 3 times = 69 4 times = 30 5 times = 17 6 times = 15 More than 6 times = 4 Total = 150	522.939[a]	410	.000
How often you hang around with your friends for eating at your favorite restaurant in a week?	Once in a week = 54 2 - 4 times = 75 5 - 7 times = 14 More than 7 times = 7 Total = 150	229.710[a]	246	.765
How often do you eat take out (pizza, KFC, McDonalds, etc.)?	Everyday = 4 Once a week = 71 2-8 times a week = 47 Never = 28 Total = 150	253.525[a]	246	.357
What time you take your first meal?	6:00 - 7:59 am = 27 8:00 - 9:59 am = 91 10:00 -11:59 am = 25 12pm & onwards = 7 Total = 150	249.113[a]	246	.433
What time you take last meal?	6:00 - 7:59 pm = 39 8:00 - 9: 59 pm = 67 10:00 - 11:59 pm = 30 12 am and onward = 14 Total = 150	257.591[a]	246	.293
Do you ever "comfort eating"?	Yes = 63 No = 87 Total = 150	82.618[a]	82	.460
Do you ever count your calorie intake as a way to control your weight?	Yes = 110 No = 40 Total = 150	102.017[a]	82	.066
Do you tend to overeat when you feel stressed?	Yes = 70 No = 80 Total = 150	86.527[a]	82	.345
Do you Eat Breakfast?	Yes = 27 No = 123 Total = 150	87.669[a]	82	.314
Do you feel that dieting is hard for you?	Yes = 60 No = 90 Total = 150	89.871[a]	82	.259

The correlation between frequency of exercise (physical inactivity) and obesity has been analyzed by asking 6 items. Table 4 describes that obesity is positively significant with item 'do you like exercise?' with $p < 0.05$, and 'how often do you exercise for at least twenty minutes?' were positive correlated with obesity with $p < 0.05$ including the value 429.437[a] and degree of freedom 328. Remaining items such as 'what activity you normally do when you take some exercise at least for twenty minutes?', 'what activity do you prefer in order to wind down and relax?', 'how much time normally you lose for those activities per week?', and 'if you wanted help or advice on how to more active, what sort of help would you prefer?' were found insignificant with obesity.

Table 4: Correlation of frequency of exercise (physical inactivity) and obesity

Items	Counts	Pearson Chi-Square		
		Value	df	Asymp. Sig. (2-Sided)
Do you like exercise?	Yes = 83 No = 67 Total = 150	131.591[a]	82	.000
How often do you exercise for at least twenty minutes?	No Exercise = 24 Once a week = 31 2-3 times a week = 62 4-5 times a week = 26 Everyday = 7 Total = 150	429.437[a]	328	.000
What activity	Play football = 15 Cycling = 13	413.768[a]	405	.371

you normally do, when you take some exercise at least for twenty minutes?	Swimming = 3 Aerobics = 24 Play badminton = 28 Others = 66			
What activity do you prefer in order to wind down and relax?	Watching TV/videos/DVDs = 69 Playing computer games = 7 Using the internet = 20 Reading (novel/magazines/etc.) = 13 Listening to radio/music = 18 Sleeping = 15 Others = 8 Total = 150	530.969[a]	492	.109
How much time normally you lose for those activities per week?	less than 7 hours = 124 14 hours = 16 21 hours = 3 more than 21 hours = 6 Total = 149	247.941[a]	246	.453
If you wanted help or advice on how to more active, what sort of help would you prefer?	Advice from a doctor or other health professional = 83 A group of people to be active with = 35 Advice from a health professional over the telephone = 6 A video tape to follow at home = 12 Book on how to start being more active = 3 a program/advice sent to you via the post mail/email = 1 a program/advise provided through the internet = 10 Total = 150	470.244[a]	492	.753

Further, Spearman correlation analysis was performed on a scale data. Analysis explained that, obesity is significantly correlated with the variables shown in Table 5. It shows that feelings (low self-esteem) (r_s = .938) with $p < 0.05$, physical activity barriers (r_s = .544) $p < 0.05$, media influence (r_s = .721) with $p < 0.05$ are positively and highly significantly correlated to obesity. The meaning of positive correlations is the higher the outcome score of the factor, higher will be the effect on obesity.

Among these factors such as dieting behavior, health knowledge, religious knowledge and religious practices and their relation with obesity was found insignificant by Spearman correlations analysis. Correlation coefficients have shown the positive correlation but their corresponding p-values have explained that these indicators were insignificantly correlated with obesity like dieting behavior and obesity has correlation coefficient (r_s = .141) with $p > 0.05$. It means dieting behavior and obesity has positive relationship, however insignificantly correlated to each other. Similarly, it goes with remaining variables like religious knowledge r_s = -.098 with $p > 0.05$, religious practices r_s = -.064 with $p > 0.05$ and their relation with obesity r_s = .078 with $p > 0.05$ are positively associated. Moreover, health knowledge, religious knowledge and religious practices are negatively correlated with obesity but insignificant at 0.05 level of significance.

Table 5: Correlation between scales based social factors and obesity in Malay obese people using Spearman

Sample	Constructs	Correlation Coefficient	Sig. (2-Tailed)
	Feelings (Low Self-esteem)	r_s = .938	.000
	Dieting Behavior	r_s = .141	.086
	Health Knowledge	r_s = -.014	.870
	Physical Activity Barriers	r_s = .544	.000
	Media Influence	r_s = .721	.000
	Religious Knowledge	r_s = -.098	.232
	Religious Practices	r_s = -.064	.437
	Religious Practices relation with obesity	r_s = .078	.346

5. Discussion

The pervasiveness of the obesity has increased twofold within Malaysia. Particularly, the ratio was recorded 27.6% among Malay obese adults in Terengganu [7]. The social factors have impact on weight gain and needs an effective management to avoid from obesity [31].

The findings of this study reports that feelings (low self-esteem) have a positive correlation r_s = .938; p = .000 with the obesity. In [32] conducted a study has determined the results of higher BMI status among population. The increasing weight is associated with low self-esteem. From the results of present study, it can be concluded that Malay obese people who have higher BMI, also have a tendency of lower self-esteem. This study shows that relationship of body image dissatisfaction and obesity. The questions were asked 'do you think that you have an ideal body', 'I think, I am overweight', and 'have some told you that you are overweight' was significantly positive correlated. In [33] also revealed the relationship between body image dissatisfaction and obesity. BMI was positive correlated with the body image dissatisfaction (r = .36, $p < .01$). There may be the pressure from media that has impact on weight gain and give the image of ideal shape besides people spending more time on the internet, social sites, watching TV etc. [34].

There was also a significant positive correlation between frequency of eating and dieting (eating habits) and obesity. The result of this present study shows the relationship of asked item 'how many times you eat in one day' with p = .000. From the result, we can assume that Malay participants have less frequency of eating which is in line with European population have also less eating frequency [35]. The reason may be described as correlation between obesity and frequency of eating and dieting (eating habits) is a result of the self-reported dietary patterns and higher intake of energy. It's been reported that self-reported dietary pattern has a relationship with obesity [36]. In [37] demonstrated that the higher number of eating frequency was related with a lower chance for obesity. Furthermore, 'how many times have tried to lose weight by dieting in last 6 months?' have a significant correlation p = .000 with obesity. The attempts to lose weight through dieting has also found a significant correlation with obesity as if an individual is taking a diet will probably increase the chance of high risk of possibilities to lead towards either unplanned meals or overeating; hence breaking the rules of dietary abstinence has been found by [38].

This study has also been revealed the relationship of the frequency of exercise (physical inactivity). The items were asked 'do you like exercise' with p = .000, and 'how often do you exercise for at least twenty minutes' with p = .000 describes its positive correlation. Less frequency of exercise (physical inactivity) has been found among participants, and also responsible for higher ratio of obesity among them. Nonetheless, the habit of physical exercise can keep away from the risk of chronic diseases due to obesity [39]. In addition, physical activity barriers had a significant correlation (rs = .544, p = .000) with obesity. In [30] had determined that the prevalence of physical activity barriers is more than 25%. Statistical analysis reports that obese participants had high physical activity barrier score (< 0.001), higher personal ($p < 0.001$ and

social environment (p = 0.034) as compared to normal individuals. The present study had also assessed the significant correlation of the media influence (rs = .721, p = .000) with obesity. Further, study has been interpreted that there was a positive correlation between dieting behavior and obesity but found no significance (r_s = .141, p = .086). Also no significance was found between health knowledge r_s = -.014, p = .870 and obesity. Interestingly, no correlation had been assessed between religious knowledge (r_s = -.098, p = .232), Religious practices (r_s = -.064, p = .437) and their relation with obesity (r_s = .078, p = .346). Subjects have moderate knowledge about the lifestyle of Prophet. Most of the subjects know that religious practices have relation with obesity and follow the lifestyle of Prophet can prevent from obesity.

6. Conclusion

It is a pioneer study that has evaluated the relationship of social factors and obesity among Malay obese adults. The reason to conduct this study was to set a database of the social factors associated with obesity in Malaysia. Since, the information of social factors was missing in pervious researches and has mainly focused on only genetic factors.

This study has revealed that majority of the social factors significantly correlated with obesity. The findings of this study can be useful for the medical experts to align with these social factors as well as provide the baseline data for the effectiveness of the national programs of the prevention and control the obesity among adult obese people in Malaysia. Therefore, interventional programs should be arranged keeping in view the social factors to decrease the level of obesity in Terengganu, by the government. The sample population for this study was Malay race living in Terengganu, other races and states are excluded that is considered the limitation of the study. Further, studies should be conducted in other states of the country including all races to evaluate the mechanism of social factors with obesity. In addition, behavior change and adoption of a healthy lifestyle can participate significantly in the prevention of these social factors associated with obesity.

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