

ORIGINAL ARTICLE

PERCEIVED BODY IMAGE AND ITS RELATIONSHIP WITH BODY MASS INDEX, SELF-ESTEEM, BODY CHANGE STRATEGY, AND SOCIAL NETWORK USAGE AMONG RURAL ADOLESCENTS IN SARAWAK, MALAYSIA

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ABSTRACT

Body image is a complex and multifaceted construct with multiple associated factors determining its perception among adolescents. This study aimed to determine the perceived body image and its relationship with body mass index, self-esteem, body change strategy, and social network usage among rural adolescents. This study was a cross-sectional study design using a multistage random sampling technique to select adolescents aged 10 to 19 years. A total of 318 adolescents' data were collected using a self-administered questionnaire. Data analysis was done using SPSS version 22.0 with a p-value of <0.05 was considered statistically significant. The mean (SD) age of adolescents was 14.6 (2.7) years with a male and female ratio of 1.09:1. The mean score (SD) of perceived body image was 3.63 (0.87). Multiple linear regression analysis revealed that gender, body mass index, and strategy to increase weight could predict perceived body image among adolescents. However, self-esteem did not correlate with perceived body image. Although, the body image dissatisfaction level was low among rural adolescents compared to other studies in Malaysia. However, it can still pose a threat to adolescents' health if not addressed accordingly.

Keywords: Body image, Body change strategy, Self-esteem, Social network usage, Sarawak, Malaysia

INTRODUCTION

Body image is a person's perceptions, thoughts, and feelings about his or her body¹. It is a complex and multifaceted construct², which can be examined through various elements, such as appearance satisfaction and appearance orientation³. Body image is closely related to adolescents' growth and development⁴. During the adolescence phase, adolescents are subjected to physical, cognitive, psychosocial, and social developments. These developments can result in either body image satisfaction or body image dissatisfaction⁵.

Male and female adolescents generally have different body image preferences. Males typically prefer muscular body size and shape, while females usually sought for body thinness⁶⁻¹⁰. Body image preferences among adolescents can be caused by various factors such as peer pressure, media influences, and celebrities influence¹¹. These factors, especially media influences, usually portray females having thin body figures and males with muscular body shape. As such, adolescents who do not have the portrayed body image may become dissatisfied with their body image.

In Malaysia, previous studies had been done to assess perceived body image among secondary school students¹²⁻¹⁷. The prevalence of adolescents who were dissatisfied with their body image was between 33% and 78%. These studies also found that a higher percentage of female

adolescents were dissatisfied with their body as compared to male adolescents. The highest percentage of body image dissatisfaction was reported previously¹³, whereby up to 82% of its female respondents were found to have body image dissatisfaction. Similar findings were reported among Japanese and 77.2% of Finnish adolescents¹⁸.

Body image dissatisfaction is sometimes dangerous. It is associated with disordered eating behaviours, unhealthy weight control behaviours, low physical activity, exercise, lower self-esteem, and suicidal ideation¹⁹⁻²⁶. By identifying the factors associated with perceived body image, relevant authorities would address this issue among adolescents accordingly. Apart from peers, celebrities, and media influence body image¹¹, there are other factors associated with perceived body image. These factors include body mass index, self-esteem, and social network usage²⁶⁻²⁸.

Body mass index (BMI) measures a person's nutritional status and overall body size and shape²⁹. Male adolescents with normal BMI were found to be more satisfied with their body image as compared to underweight or overweight counterpart³⁰. On the other hand, female adolescents who were underweight are more satisfied with their body image than normal-weight and overweight female adolescents. Abdul Latif et al.³¹ found that almost 80% of the overweight adolescents were dissatisfied with their body image while less than 60% of normal-weight and underweight adolescents had body

image dissatisfaction. However, Canpolat et al.³² found contradicting results whereby all BMI groups had similar body image satisfaction levels among adolescents. As such, this study aims to determine the relationship between perceived body image and BMI among adolescents.

Self-esteem is the degree to which a person holds his or her acceptance or rejection attitudes toward him or herself³³. Self-esteem is often associated with body image^{26,34,35}. A majority of the studies determined that current perceived body image can predict future self-esteem^{26,36-38}. However, previous studies were able to determine that self-esteem can predict future perceived body image^{26,39}.

Social networking is used to communicate with people who share your interests using a website or other service on the internet⁴⁰. Widely available modern technology, peoples have access to the internet, adolescents are much easier to be influenced by the content they view on various social network platforms^{41,27}. Social networking can cause adolescents to develop body image dissatisfaction through social comparison with friends and celebrities^{42,43}. As rural adolescents also started to have access to the internet, they too are prone to be influenced by content on social networks.

Body change strategies are methods used by a person with body image dissatisfaction to improve his or her body image⁴⁴. The commonly used body change methods are excessive exercise, disordered eating behaviours, and medication use^{27,45}. A few studies in Malaysia assess the disordered eating behaviour among adolescents^{12,17}. One study in Malaysia surveyed the muscle increasing strategies used by adolescents to improve body image, especially among males⁴⁶. All these studies conducted among urban adolescents do not represent the rural population, which may have different body change strategies. This research also aims to provide a more in-depth understanding of the body change strategies used by rural adolescents and the relationship with perceived body image.

METHODS

Study setting

This cross-sectional study was designed to collect information on perceived body image, BMI, self-esteem, body change strategy, and social network usage among rural adolescents in Samarahan and Asajaya districts of Sarawak. The study was conducted from September 2019 until August 2020. The inclusion criteria were mentally sound adolescents aged between 10 and 19, irrespective of gender, staying in Samarahan and Asajaya districts.

Ministry of Rural Development defined rural areas as areas outside of town areas gazetted by the

Department of Statistics Malaysia and areas not under local councils' authority. The list of rural villages was obtained from Samarahan and Asajaya District Office, respectively. There are a total of 50 rural villages from Samarahan district and 49 rural villages from Asajaya district.

Data collection instruments and procedure

The current sample size was calculated using a single proportion formula. With the anticipated prevalence of 78%¹³, confidence interval of 95%, and a non-response rate of 20%, the minimum sample size required was 316. The sampling procedure was based on a multistage sampling approach. The decision on the total respondents for each selected rural village was based on population proportion. Malaysia population census found that adolescents are representing 20% of the total population⁴⁷. As such, this study chose to select 16 respondents to represent each selected rural village. For the selection of villages, the villages were arranged in alphabetical order for each district. The selection of villages from the lists started with a random number, followed by every 5th interval. Ten villages were selected from each district to reach the sample size of 316 adolescents. Data was collected using a self-administered questionnaire consisting of five parts: Part A: Demographics; Part B: BMI and social network usage; Part C: Perceived body image; Part D: Body change strategy; and Part E: Self-esteem.

Measurements

Perceived Body Image was assessed using 10 Likert-scale questions. These items were adopted and translated from Body Image Concern subsection of Body Image and Body Change Questionnaire (BIBCQ)⁴⁸. The scale consists of five rating score ranging from one (1) "extremely dissatisfied" to five (5) "extremely satisfied". An overall mean score of perceived body image used for statistical analysis. The higher mean score would indicate that more respondents are satisfied with their body image.

Body Mass Index was calculated by measuring respondents' body weight and height. Bodyweight was measured using a portable weighing scale. The respondents were asked to remove their shoes before measurement. Weight was taken to the nearest 0.1 kg. Body height was measured against a stadiometer with stand upright with heels and occiput against the stadiometer looking straight ahead. Frankfurt plane (straight line between the lower border of eye orbit and upper margin of external auditory meatus) was ensured to be horizontal and perpendicular to the body initial height measurement being taken. Height was taken to the nearest 0.1 cm.

Self-esteem was assessed using 10 Likert-scale questions. These items were adapted from Rosenberg Self-esteem scale³³. It has five positively worded items and five negatively

worded items. The scale consists of four rating score ranging from zero (0) “*strongly disagree*” to three (3) “*strongly agree*”. Reverse scoring was used for negative items. The translated Malay version of the scale was used ⁴⁹. An overall summative score of self-esteem was used for statistical analysis.

Body Change Strategy consists of six sub-sections, namely food practices, food supplements, strategies to lose weight, strategies to increase weight, strategies to increase muscle tone, and strategies to increase muscle size. These items were adopted and translated from respective sub-sections of Body Image and Body Change Questionnaire (BIBCQ)⁴⁸. Food practices assess respondents’ binge eating behaviours; food supplements assess respondents’ usage of diet pills or steroids for body change; strategies to lose weight, increase weight, increase muscle tone, and increase muscle size assess respondents’ change in eating habit and usage of exercise for body change in the respective sub-sections. Each sub-section consists of 6-10 Likert-scale questions ⁴⁸. The scale consists of five rating score ranging from one (1) “*always*” to five (5) “*never*”. An overall mean score of each sub-section was calculated for statistical analysis. The high mean score would indicate respondents were less likely to practice respective strategies for body change.

Social network usage was assessed using one question. The respondents were given seven options, i.e., “Facebook,” “Instagram,” “YouTube,” “Messengers,” “Twitter,” “Pinterest”, and “others” to choose from, and were allowed to choose multiple options. The total number of social network uses were calculated for statistical analysis.

The questionnaire was initially developed in the English version. Next, it was translated into Malay version by two translators whose mother tongue is the Malay language. After combining both the Malay version, the questionnaire was back-translated into an English version. The finalised Malay version proceeded for Pre-test.

Pre-test

A questionnaire pre-test had been performed in two rural villages, one from each district. Both of these villages are in the non-sampled area. A total of 36 respondents participated in this pre-test. The respondents consist of three ethnic groups, namely Malay, Iban, and Chinese. The purpose of this pre-test was to evaluate the quality of the questions and to be answered in terms of logically sequenced, comprehensibility, and average period. After completing the questionnaire, each respondent was asked to explain each question in the questionnaire as well as the response they choose. For non-Malay respondents whose mother tongue was not Malay language, they were enquired whether they were able to understand each statement clearly. For any unclear

statement, the respondents were asked to provide the statement in their own words. Feedbacks from each respondent were obtained and recorded. Minor changes in the questionnaire had been made following the pre-test.

In reliability analysis, the Cronbach’s alpha for each section was generally reliable. For part C, the Cronbach’s alpha was 0.92. For part D, the Cronbach’s alpha were 0.83, 0.80, 0.81, 0.73, 0.76 and 0.83 for each of the respective sub-sections. For part E, the Cronbach’s alpha was 0.67. A reliability coefficient of 0.7 and above was considered as reliable instrument for survey research ⁵⁰.

Data entry and analysis

Collected data were checked and verified manually. Next, the data were entered into computer ⁵¹ using Microsoft excel with a validation check. The raw data were imported to the analytic tool Statistical Package for Social Science (SPSS) version 22 for Windows ⁵². The data were coded and verified for duplication before analysis.

Pearson’s moment correlation was used to correlate perceived body image with BMI, self-esteem, body change strategy, and social network usage. A stepwise multiple linear regression analysis was done to determine the factors associated with perceived body image. The perceived body image was the dependent variable with continuous data. A standardised latent variable score with the mean ‘0’ and standard deviation ‘1’ was calculated. The gender was a dummy coded ‘1’ as male and ‘0’ as female. Firstly, skewed and outliers data were determined. Univariate and multivariate outliers were identified using Mahalanobis distance ⁵³, Cook’s distance, and studentised residuals with ± 2.0 standard deviation. After bivariate Pearson’s moment correlation, multicollinear variables were removed from the model. A total of 38 data were removed due to outliers. Age, gender, BMI, self-esteem, all six body change strategies’ sub-sections, and social network usage were entered into the model. A p-value of less than 0.05 was considered statistically significant.

Ethical issues

Concerning the possible ethical issues related to this research, adolescents’ participation in this research was voluntary and consented to by respective parents. The adolescents’ identity and personal information were kept confidential to ensure that the adolescents’ personal information was not disclosed. The ethics approval was obtained from the Faculty of Medicine and Health Sciences ethics committee, Universiti Malaysia Sarawak (Ref: UNIMAS/NC-21.02/03-02 Jld.4 (49)).

RESULTS

Characteristics of respondents

A total of 318 adolescents participated in this study. Table 1 illustrates the characteristics of respondents. The respondents' mean age (SD) was 14.6 (2.7) years with a minimum age of 10 and the maximum age of 19 years. The gender of respondents was almost equal, with the male at 52.2% and female at 47.8%. The majority of the

respondents were of Malay ethnicity and Islam faith.

Perceived body image, body mass index, self-esteem, food practices and supplements, and body image strategies

Table 2 shows the mean (SD) for perceived body image, BMI, self-esteem, body change strategy, and social network usage. The mean (SD) for perceived body image was 3.63 (0.83).

Table 1: Sociodemographic characteristics of the respondents (n=318)

Variables	n	%	Statistics
Age in years			Mean (SD) = 14.64 (2.7) years Min=10, Max 19
Gender			
Male	166	52.2	
Female	152	47.8	
Race			
Malays	173	54.4	
Non-Malay Bumiputras	112	35.2	
Chinese	33	10.4	
Religion			
Islam	180	56.6	
Christianity	105	33.0	
Buddhism	30	9.4	
Baha'i Faith	3	0.9	

Table 2: Mean distribution Perceived body image, body mass index, self-esteem, food practices and supplements and body image strategies

Variables	No. Items	Mean	Std Deviation	Median	Min	Max
Perceived Body Image	10	3.63	0.87	3.50	1.0	5.0
Body Mass Index		20.4	5.54	19.5	11.2	51.9
Self-esteem	10	16.9	2.75	16.0	8	24
Food Practices	9	4.02	0.74	4.11	1	5
Food Supplements	10	4.57	0.55	4.80	2.6	5
Strategies to lose weight	9	4.09	0.75	4.22	1	5
Strategies to increase weight	9	4.12	0.70	4.22	1	5
Strategies to increase muscle tone	6	4.10	0.80	4.17	1	5
Strategies to increase muscle size	6	4.14	0.77	4.17	1	5
Social network usage		2.15	1.66	2.00	0	7

Factors affecting Perceived Body Image

Table 3 shows the analysis of stepwise multiple linear regression. For the final model, gender, BMI, number of social network use, and strategies to increase weight had a potential impact on perceived body image with adjusted R-square =0.162. The ANOVA for the fourth model showed a statistically significant [F(df)=14.436(279); p<0.001]. The analysis revealed that gender (20.2% contribution in the model) was the most important predictor of perceived body image, followed by strategies to increase weight (16.1% contribution). However, the number of social networks used (17.4% contribution) and BMI (15.3%) had a negative effect on perceived body image (p<0.01).

DISCUSSION

The current study found that the mean perceived body image score was 3.63, which is higher as compared to previous studies in Malaysia⁴⁴. In contrast, this value was similar to other countries' perceived body image level, such as New Zealand and Tonga. The higher mean value indicates that rural adolescents were satisfied with their body image as compared to Chinese-Malaysians. It should be noted that McCabe's studies only assessed Chinese-Malaysians who were staying in Peninsular Malaysia. As such, McCabe's study may not be representative of the whole of Malaysia. Nevertheless, this study used the original BIBCQ that consists of ten items for perceived body image, while McCabe et al.⁵⁴ used a revised BIBCQ that only has five items. The use of different questionnaires may cause a discrepancy between these two studies among Malaysian adolescents.

Table 3: Factors affecting Perceived Body Image: Stepwise multiple linear regression analysis

Model	Unstd. B	SE	Std. Beta	95.0% CI for B		Correlations Part	Adj. R ²
				Lower Bound	Upper Bound		
1 (Constant)	0.373	0.088		0.200	0.546		0.072
Social network	-0.161	0.034	-0.274***	-0.227	-0.094	-0.274	(p<0.001)
2 (Constant)	0.157	0.106		-0.051	0.365		0.109
Social network	-0.153	0.033	-0.262***	-0.219	-0.088	-0.261	(p<0.001)
Gender	0.378	0.107	0.200***	0.167	0.589	0.199	
3 (Constant)	1.013	0.274		0.474	1.552		0.141
Social network	-0.154	0.033	-0.263***	-0.218	-0.090	-0.262	(p<0.01)
Gender	0.403	0.106	0.213***	0.196	0.611	0.212	
BMI	-0.044	0.013	-0.188**	-0.070	-0.018	-0.188	
4 (Constant)	0.913	0.273		0.376	1.450		0.162
Social network	-0.137	0.033	-0.233***	-0.201	-0.072	-0.229	(p<0.01)
Gender	0.385	0.104	0.203***	0.179	0.590	0.202	
BMI	-0.041	0.013	-0.175**	-0.066	-0.016	-0.174	
Strategies to increase weight	0.173	0.062	0.157**	0.051	0.295	0.153	

For BMI, stepwise multiple linear regression analysis also found that BMI was one of the predictors for perceived body image. This finding was similar to other studies, whereby overweight and obese adolescents are found to be dissatisfied with their body image^{19,28}. Adolescents are easily influenced by the media's portrayal of ideal body image, a thin body figure for females, and muscular body figures for males. Adolescents who do not have the ideal body figure would be dissatisfied with their body image, especially among those who are overweight or obese.

This study found no correlation between self-esteem and perceived body image. This finding was inconsistent with other studies whereby body image was correlated with self-esteem^{26,36,37}. The lack of relationship between perceived body image and self-esteem might be associated with the cultural norm in the community, which emphasised integration among adolescents, thus leading to better self-esteem⁵⁵.

This study explored the effect of body change strategies on perceived body image. The high mean value (>4.00) for each body change strategies indicated that the adolescents were at low risk of participating in these body change strategies. The regression analysis found that only the use of strategies to increase weight had an impact on perceived body image. The positive correlation of this relationship indicated that adolescents who were at risk of practising strategies to increase weight were also dissatisfied with their body image. As strategies to increase weight have similar methods with other strategies such as changing eating habits and eating more, the outcome of these strategies would lead to increase body weight. This outcome may not be desirable among adolescents, thus leading to further body image dissatisfaction as well. Previous studies used body image satisfaction levels to predict which body change

strategies may be used by adolescents to improve body image^{56,57}. These studies did not examine the effect of body change strategies on perceived body image. As such, it was not possible to compare some of the findings in this study with previous studies. Further longitudinal studies are needed to explore these relationships for adolescents.

Regression analysis identified the number of social networks used as one of the predictors for perceived body image. Related studies found that social networks can cause body image dissatisfaction through social comparison with friends and celebrities^{42,43}. Social networks provide a platform for users to share and view photos and videos. Adolescents may use these platforms to compare themselves with their friends or celebrities, leading to body image dissatisfaction⁵⁸.

There were several limitations identified in this study. Firstly, the results obtained would not be generalisable as it was conducted in two districts of Sarawak. Secondly, this was a study cross-sectional study; cause and effect relationship could not be determined as both the independent (self-esteem, personal characteristics) and dependant variables (perceived body image) were measured in the same timeframe. Lastly, respondents were required to answer all the questions; they may have responded to each question without going into depth⁵⁹.

CONCLUSION

In conclusion, the body image satisfaction level was higher among adolescents in the rural area of Samarahan and Asajaya districts as compared with other studies in Malaysia. Despite the lower level of body image dissatisfaction, it can still be a threat to adolescents' health. The current research also concluded that gender, BMI,

engaging in strategies to increase weight, and social network usage contribute to adolescents' perceived body image. Lastly, this study did not find any significant relationship between perceived body image and self-esteem, although various studies proved otherwise. Public health practitioners could use this study's results to improve adolescents' health services in relation to perceived body image through further public health research, practices, and health policies.

Conflict of interest

The authors declare no potential conflict of interest.

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