



Research Article

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Health Related Quality of Life among Saudi Undergraduate Students with Different Categories of Body Mass Index

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ABSTRACT

Background : Health related quality of life (HRQoL) is a critical indicator of one's perception of health and well-being. The objective of the study was to assess and compare HRQoL among undergraduate students at different categories of body mass index. Method: 140 undergraduate students at the mean age 19 ± 0.70 years were randomly assigned into underweight $< 18.5 \text{ kg/m}^2$ [$n= 37$: 26.4%], normal-weight $18.5\text{-}24.9 \text{ kg/m}^2$ [$n= 31$: 22.1%], obese $\geq 30.00 \text{ kg/m}^2$ [37 : 26.4%] and obese class III $\geq 40.00 \text{ kg/m}^2$ [$n=35$: 25%] groups. HRQoL was also measured using CDC HRQOL-14. Results: SRH-good results were as the following: underweight students 87%, normal weight 94%, obese 73% and obese-III 57%. The activity limitation days were observed more among obese and obese-III category expressing lack of sleep, worrisome and depression. Underweight and obese category students exhibited less energetic days. Conclusion: HRQoL was low among obese and obese class III students. Normal weight category students exhibited better SRH-good. Obese class had more unhealthy days with regard to physical and mental issues and reported more days of activity limitation due to pain, depression and lack of sleep. Obese students had greater impairments in emotional problems.

Key words: *Health Related Quality of Life, Body Mass Index, Physical Health, Mental Health.*

INTRODUCTION

There are numerous definitions for the term quality of life (QoL) in research literature. QoL can be related to enrichment of health model of physical activity like personal enjoyment, improved vitality and enhanced mood states. Quality of life can also be pertinent to disease prevention model, where focus is on prevention of CHD (coronary heart diseases), certain types of cancers and obesity [1]. The self-perceptions of health may be predicted as morbidity and mortality [2]. The most quality of life definitions measure physical, mental, emotional and spiritual health, and subjective well-being (high levels of life satisfaction, positive affect experience and absence of negative emotions). QoL also includes gaining of socially accepted characteristics [3-5].

Health related quality of life (HRQoL) is defined as a multidimensional construct incorporating emotional, physical, social, and subjective feelings of well-being [6]. It is a notion that incorporates the assessment of well-being in many facets of life, including physical and emotional functioning, mental status, and social well-being [7, 8]. The self-perceived health of a person consists of assessment of well-being and functionality in different aspects of life, including physical and mental health, emotional well-being, self-esteem, acceptable social norms, and family associations [9, 10]. HRQoL reflects one's self-perceptions of enjoyment and satisfaction with life [11]. Health related quality of life is lower among obese children than their normal weight peers [11, 12]. Fontaine and Barofsky (2001) confirmed that the physical domains of HRQoL are most impacted by obesity [13]. Another study revealed that physical and psychosocial HRQoL is negatively impacted by obesity [14]. Overweight or obese children rated their health related quality of life in the context of physical size and demonstrated how their physical size impacted their daily functioning [15]. Obese individuals reported body

pain as a common problem that impaired their HRQoL [16]. Obesity in relation to health related quality of life relation is explained as people who are obese are significantly impaired as a result of their obesity [17].

Obesity is associated with reduced health related quality of life when compared to the non-obese population [6, 18-20]. Indeed, obesity is associated with major medical and psychosocial comorbidities [21, 22], and people with obesity are expected to experience sub-optimal health for a much higher proportion of their life than those without [23]. Obesity has a substantial impact on a person's functional capacity and the quality of life [24]. Therefore, HRQoL is a critical indicator of one's perception of health and life satisfaction. Body Mass Index is an explanatory factor of self-perceived quality of life [25].

BMI ≥ 30 is considered a major public health issue. Saudi Arabia has become more westernized over the years and prevalence of overweight and obese population is also alarmingly increasing [26]. A recent national study revealed that one out of four adult males and one out of three adult females suffer from obesity [27]. The two most contributing factors leading to obesity epidemic in Saudi Arabia are intake of imbalanced diet and lack of regular physical activities [28, 29]. Studies revealed that prevalence of overweight and obesity among male college students in Saudi Arabia is 21.8% and 15.7%, respectively [30]. Another study documented that 49.8% of male undergraduate students were either overweight or obese [31]. Therefore, the objective of the present study was to assess and compare health related quality of life among Saudi undergraduate students at different categories of body mass index.

MATERIALS AND METHODS:

Participants

For the purpose of this study, 140 undergraduate students were voluntarily recruited from the King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia. The study was approved by the Deanship of Scientific Research committee. The samples were categorized in the underweight 37 (26.4%), normal-weight 31 (22.1%), obese 37 (26.4%) and obese class III 35 (25%) groups. The age of the students were ranging from 17-21 years with mean (SD) 19 (0.70) years. On the basis of BMI, four categories were formed as underweight <18.5 kg/m², normal weight 18.5-24.9 kg/m², obese ≥ 30.00 kg/m² and obese class III ≥ 40.00 kg/m². Approval was taken from the university research committee and subsequently the study was financially supported by Deanship of Scientific Research, KFUPM.

Measures

Health-Related Quality of Life Scale (HRQoL-14) [32] allows subjects to rate their self-perceived overall health status and the influence of various symptoms on their daily activities. The HRQoL core is the first four questions of HRQoL-14 survey. These core questions measure the number of unhealthy days a person has had in the last 30 days (one month). The respondents were asked to rate their overall health on a 5-point scale ranging from "excellent to poor" in the first question. The number of days the respondents had poor physical and mental health were estimated in Question 2 and 3. Question 4 expressed the major impairment or health problem (physically/mentally) due to stopping the activities. Questions 5, 6, 7, 8, and 9 addressed specific impairments and illness issues related to their health. Activity limitation days, feeling of pain, sadness, anxiety, depression, lack of sleep, feeling energetic in last 30 days were addressed through questions 10-14. The questions were evaluated on a 7-point scale "ranging from 0= 0 days, 1= 1-2 days, 2= 3-5 days, 3= 6-9 days, 4= 10-19 days, 5= 20-29 days, and 6= all 30 days". Less number of unhealthy days means the higher level of HRQoL. In question 1, the respondents were asked to rate their own health by answering excellent, very good, good, fair, or poor. The responses 'excellent to good' categorized as "SRH-good (self-rated health-good)" and responses 'fair and poor' categorized as "SRH-poor (self-rated health-poor)". The HRQoL-14 is a valid, reliable tool studied on several samples of adult population [33, 34]. The HRQoL core has shown a good validity in adolescent and college populations as well [35].

Statistical Analyses

Categorical data were summarized using frequency, number and percentage, and continuous data were summarized using mean and standard deviation (SD). The association between qualitative variables was analyzed using Chi-square test; where frequency <5 , we used Fishers exact to compare self-reported HRQoL between the BMI levels. Two sample independent t- test (Mann-Whitney U test) was used to compare the quantitative variables between two groups. A significance level of 0.05 was considered for the statistical tests. The data were analyzed with the IBM SPSS Statistics 24.0.

RESULTS

Table 1. Summary of physical characteristics in the four BMI categories

	Under-weight (N=37)	Normal (N=31)	Obese (N=37)	Obese-III (N=35)	p-value
Age (years)	19 (1)	19 (1)	18 (1)	19 (1)	0.001
Weight(kgs)	51.78 (4.46)	64.84 (12.25)	111.59 (12)	131.14 (14.31)	<0.001
Height (cms)	173 (7)	173 (8)	175 (8)	173 (8)	0.582
BMI (kg/m ²)	17.26 (0.87)	21.51 (3.05)	36.35 (2.02)	43.86 (3.38)	<0.001

140 students, aged between 17 to 21 years with mean (SD) of 19 (0.70) years, were participated in this study. The samples were categorized as per the body mass index (BMI) into underweight 37 (26.4%), normal-weight 31 (22.1%), obese 37 (26.4%) and the remaining 35 (25%) were obese-class III students. There was obviously a significant p-value among BMI and weight categories due to the classification. The mean BMI of each category was 17.26 kg/m², 21.51 kg/m², 36.35 kg/m², and 43.86 kg/m², respectively as shown in the Table 1.

Table 2. The self-reported health status among BMI category

	Under-weight (N=37)	Normal (N=31)	Obese (N=37)	Obese-III (N=35)	p-value
Self-rated health					
SRH-Good	32 (86.5%)	29 (93.5%)	27 (73%)	20 (57.1%)	<0.002
SRH-Poor	5 (13.5%)	2 (6.5%)	10 (27%)	15 (42.9%)	
Unhealthy days (physical health)					
<5 days	34 (91.9%)	29 (93.5%)	32 (86.5%)	28 (80%)	0.340 ⁺
>5 days	3 (8.1%)	2 (6.5%)	5 (13.5%)	7 (20%)	
Unhealthy days (mental health)					
<5 days	27 (73%)	21 (67.7%)	24 (64.9%)	23 (65.7%)	0.880
>5 days	10 (27%)	10 (32.3%)	13 (35.1%)	12 (34.3%)	

⁺Fishers exact test was used; otherwise Chi-square test was used.
Significant at 0.05 level

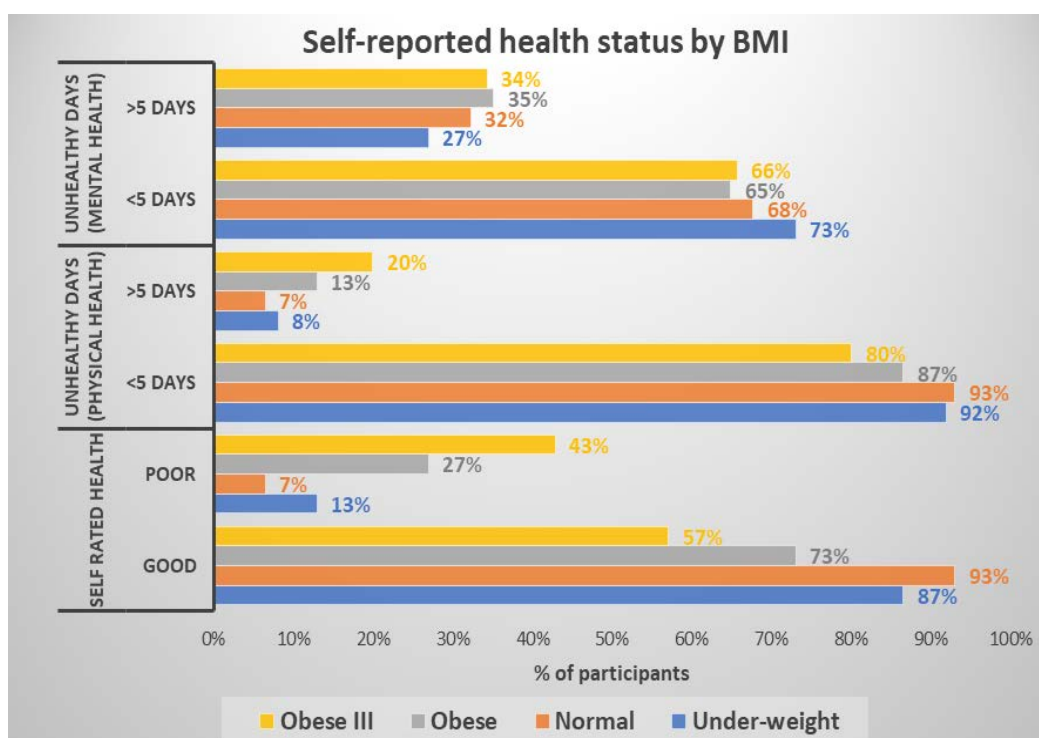


Figure 1. The self-rated health status of students on the basis of BMI levels

Data pertaining to health related quality of life (HRQoL) and its certain components are exhibited in Table 2 and Figure 1 explained the self-rated health status, unhealthy days (physical health) and unhealthy days (mental health) among BMI categories on the basis of their percentage. The health status was rated as good by 87% of underweight students, 94% of normal weight students, 73% of obese students and only 57% of obese-III students. The difference was statistically significant ($p=0.002<.05$). However, the participants who felt more than 5 unhealthy days for physical or mental health were not differed between BMI categories as p -values >0.05 .

Table 3. The summary of activity limitation days and fully energetic days of undergraduate students

	Under-weight (N=37)	Normal (N=31)	Obese (N=37)	Obese-III (N=35)	p-value
Activity limitation days					
<5 days	33 (89%)	25 (81%)	30 (81%)	29 (83%)	0.747
>5 days	4 (11%)	6 (19%)	7 (19%)	6 (17%)	
Activity limitation days due to pain					
<5 days	36 (97%)	31 (100%)	33 (89%)	31 (89%)	0.115 ⁺
>5 days	1 (3%)	0 (0%)	4 (11%)	4 (11%)	
Days with sad, blue or depression					
<5 days	31 (84%)	23 (74%)	23 (62%)	25 (71%)	0.218
>5 days	6 (16%)	8 (26%)	14 (38%)	10 (29%)	
Days with worry, tension or anxious					
<5 days	29 (78%)	20 (65%)	26 (70%)	19 (54%)	0.172
>5 days	8 (22%)	11 (36%)	11 (30%)	16 (46%)	
Days with lack of sleep or rest					
<5 days	20 (54%)	12 (39%)	14 (38%)	11 (31%)	0.245
>5 days	17 (46%)	19 (61%)	23 (62%)	24 (69%)	
Fully energetic days					
<20 days	25 (68%)	15 (48%)	27 (73%)	25 (71%)	0.135
>20 days	12 (32%)	16 (52%)	10 (27%)	10 (29%)	
⁺ Fishers exact test was used; otherwise, Chi-square test was used. Significant at 0.05 level					

Table 3 show the activity limitation days (<5 days and >5 days) due to general health including the components such as pain, sadness, blue or depression, worrisome, tension or anxiety, and lack of sleep or rest among BMI categories. The obese and obese-III category students expressed lack of sleep, more worrisome or tensed and depression compared with normal and underweight category students. The scores were not statistically significant between BMI categories as p -values were >0.05 levels. The proportion of participants with more than 20 fully energetic days was 32% among underweight students, 52% among normal weight students, 27% among obese students and 29% among obese-III students. The difference was not statistically significant as p -value >0.05 .

DISCUSSION:

The present study revealed the self-rated health status of obese and obese class III category students as SRH-poor. Marques et al. (2017), showed an association between perceived better self-rated health (SRH) and higher health related quality of life [36]. Obesity has also been associated with lower levels of health related quality of life (HRQoL) when compared to the non-obese population [6, 19, 20]. A positive association established between perceived quality of life and good self-rated health of college students [37]. Obesity also appears to bear a significant impact on a person's functional capacity and on the quality of life [24]. Recent study revealed that health related quality of life is decreased with increasing level of body mass index [38]. Body Mass Index is an explanatory factor of self-perceived quality of life and obesity is also associated with poor HRQOL [25].

Therefore, HRQOL is a critical indicator of one's perception of health and life satisfaction. These results support our findings with regard to the notion that obesity is associated with poor health related quality of life. In our study, obese and obese III category respondents reported higher scores for the physical health, mental health and activity limitations than the normal and underweight categories. No significant difference was observed among BMI categories. Poor HRQoL in obese individuals reported in various studies is not surprising and can be due to many reasons. Various comorbidities and functional limitations associated with obesity can adversely affect physical quality of life. This was consistent with findings from other studies [6, 39, 40]. Research has demonstrated a consistent relationship between obesity and lower health-related quality of life [38, 41-43]. HRQoL is lower among obese children than among their normal weight peers [11, 12, 25]. Obesity was associated with insufficient sleep or poor sleep quality [44, 45].

CONCLUSION:

It was concluded that university students with obesity had a lower HRQoL when compared with normal-weight and underweight students. Research has indicated that as BMI increase exhibits lower levels of HRQoL. Also, when obese students are compared to non-obese students, a significant difference was found in HRQoL which is often interpreted to mean that BMI is the critical cause of lower HRQoL value. The results showed that a higher body mass index (BMI) is associated with an increase in "poor health". Normal weight category students exhibited better SRH-good (self-rated health-good). Obesity was associated with deterioration in health-related quality of life (including both physical and mental health domains). The obese class had more unhealthy days of physical and mental issues and reported more days of activity limitation due to pain, depression and lack of sleep. The study also revealed that obese class students had greater impairments in emotional and social functioning. The major limitation of this study was HRQoL due to being extremely complex and multifaceted. This study focused solely on the body mass index of the participants and had no control on their physical activity and no approach toward improving health (e.g. nutrition, sleep, stress management, etc.).

Recommendations:

To tackle the obesity and its related problems at KFUPM campus, separate clubs for 'obese group' should be created and special programs on weight management, nutrition and other activities should be organized to improve their quality of life. A wellness center with necessary supporting staff may be opened to cater to the needs of obese students to promote a healthy life-style. Many research studies revealed that HRQoL can be improved with physical activity and moderate exercises, so that physical activity programs may be included in their daily routine especially for obese students.

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