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PSYCHOLOGICAL CORRELATES OF BODY MASS INDEX AND WEIGHT SPECIFIC QUALITY OF LIFE AMONG STUDENTS OF PNU

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ABSTRACT

The main objective of this study is to provide the relationship of Body Mass Index and the weight specific quality of life with psychological factors (i.e., self-esteem, and psychological well-being) among university students of Princess Nourah Bint Abdulrahman University (PNU), Riyadh, Kingdom of Saudi Arabia. Body mass Index (BMI) was calculated by using standards of World Health Organization. Three psychological measures validated and translated in Arabic language, namely, Rosenberg self-esteem scale (RSES), Brief psychological well-being scale (PWS) and impact of weight on quality of life (IWQoL) questionnaire were applied. Female university students (N=500) enrolled in bachelors' programs were approached to gather data. Pearson correlation was conducted to measure the relationship of BMI and weight specific quality of life and further with self-esteem and wellbeing. Additionally, correlation is computed to measure the relationship of BMI and weight specific quality of life with health-related factors. Statistically significant correlation (r=0.306, p< .01) was found between BMI and quality of life that confirms the relationship of actual weight with the perception of weight and quality of life. Moreover, BMI was found having significant negative correlation with wellbeing (r=-.531, p<.01). Weight specific quality of life was also found having negative correlation of self-esteem and wellbeing respectively (r=-.145, p<.01; r=-.207, p<.01). Further weight specific quality of life was having significant negative correlation with frequency of physical exercise, subjective assessment of health and body-image (r=-.131, p<.01, r=-.094, p<.01, r=-.159, p<.01). Findings are significant due to first of its kind, using translated and validated Arabic language scales in Saudi Arabia. Findings are highlighting the involvement of psychological constructs in relation with BMI and weight specific quality of life among female university students. Psychological constructs of self-esteem, wellbeing and weight specific quality of life can be considered and utilized to improve various health promotion policies and to organize awareness programs for female youth.

Keywords: Body Mass Index (BMI), Weight Specific Quality of Life, Self-Esteem, Psychological Wellbeing, Body-Image, Female University Students, PNU

INTRODUCTION

Obesity is considered as a global burden of disease that also links with mental health problems (Institute for Health Metrics and Evaluation, 2013; Avila *et al.,* 2015). Although, hazardous health effects of overweight are prevalent regardless of age, ethnicity, and culture. However, mental health problems related with overweight or obesity were found more closely affected in the female population (Ball *et al.,* 2009; Gatineau and Dent, 2011; Kanter and Caballero, 2012).

Obesity is found an alarming factor of health in KSA in general population and prominently higher in female (Memish *et al.,* 2014). This situation requires appropriate efforts from multidisciplinary teams of health professionals.

Simultaneously, it is essential to recognize accentuate psychological factors or correlates of obesity to gain better health status and to improve the quality of life among the female Saudi youth (Zaidi *et al.,* 2015a). Current study is focused to find out the relationship of actual weight (BMI) and weight specific quality of life (weight specific QoL) along with psychological aspects of self-esteem, wellbeing, the

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subjective assessment of health and body-image. Some important health-related factors, for instance, frequency of physical exercise and existence of chronic diseases will also be addressed.

Body Mass Index (BMI) is an objective measure that is directly relevant to health as well as evaluation of personal self-concept. As compare to BMI, the weight specific QoL is related to the perception of person about his own weight and how it effects the overall quality of life. As far as psychological variables are concerned, perceptions play vital role to determine life style. The relationship of actual weight and perceived weight was found yielding varies results across cultures in previous studies (Viner *et al.,* 2006). However, female university students were found having increased perceived weight than the actual and had more dissatisfaction with body image as compare to male students (Mikolajczyk *et al.,* 2010; Zaccagni *et al.,* 2014). The distortion of weight perception was also accounted with the higher occurrence of anxiety and depression among female students (Kivimaki *et al.,* 2009; Tang *et al.,* 2010). Further, the frequent occurrence of the negative correlation between BMI and weight specific QoL in many studies confirms the bonding of these variables (Wee *et al*., 2008; Renzaho *et al.,* 2010; Wang *et al.,* 2012). A study found in KSA confirmed the inverse relationship of BMI with quality of life in general and with self-esteem among female students (Habib *et al.,* 2015). However, age range of said study sample was consisted on adolescents as well as adults. Moreover, scales utilized were in English versions that might hamper to have better understanding in the Middle East. It has been noticed that there are slight differences of expression within Arabic language across Arab countries (Zaidi *et al.,* 2015b). In the current study by various aspects, these gaps are considered and adequately addressed. Female university students (18-25 years) only enrolled in bachelors' program were included. Weight specific QoL scale has been used to measure the relationship with BMI. Arabic language translated and validated scales in KSA were utilized.

There are many essential psychological constructs related to obesity or body perception. Low self-esteem, psychological wellbeing, quality of life, the subjective assessment of health and body-image are some of the factors frequently found in relation to obesity or overweight (Wardle *et al*., 2006; Fulkerson *et al.,* 2007; Martyn-Nemeth *et al.,* 2009; Mond and Baune, 2009; Ratanasiripong and Burkey, 2011; Southerland, 2013).

Previous studies have proven the relationship of low self-esteem with overweight female university students (Bodiba *et al.,* 2008). Similarly, positive, or negative self-assessment about one's body weight and appearance affect the self-assessment of certain domains of quality of life of people such as social networking or psychological wellbeing (Wardle and Cooke, 2005; Diener, 2013). BMI is found having a close relationship with self-image. Studies conduct with university students found that female students overestimated their weight and were found more dissatisfied with their body-image (Kakeshita and Almeida, 2006). Among various health effecting factors, existence of chronic diseases and frequency of exercise was also found correlated with BMI (Pietilainen *et al.,* 2008; Kearns *et al.,* 2014).

The Authors are honoured to work at PNU, which is one of the globally largest women only university located in Riyadh. By utilizing this opportunity, it was planned to investigate the related psychological constructs proposed to be involved with overweight and intern toward the poor perception of weight and quality of life.

This study has passed through two major phases. Purpose of initial phase was to explore the sociodemographic correlates of BMI categories (Zaidi *et al.,* 2015a). Later stage (Zaidi *et al.,* 2015b) was more focused to validate and translate three psychological measures of Rosenberg self-esteem scale (Rosenberg, 1965), Brief Psychological Well-being Scale (Su *et al.,* 2013), and Impact of weight on quality of life questionnaire, short-form (Kolotkin *et al.,* 2001). The nature of current study tried to obtained the facts and will allow to draw connects between Body Mass Index, self- esteem, psychological well-being, quality of life and other health related factors among the female University students. Thus, it was hypothesized that,

- There will be significant correlation between body mass index and weight specific quality of life.
- Student scores on BMI and weight specific quality of life will negatively correlate with self-esteem and wellbeing.

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- The student scores on BMI and weight specific quality of life will negatively correlate with health-related factors (Physical Exercise, Chronic Diseases, Subjective Assessment of Health, Body-image).

MATERIALS AND METHODS
The present study used positivist research paradigm (Creswell, 2003). The research method applied was quantitative in nature in which survey method used different standardized self-report questionnaires was employed. The current study dealt with the perceptions of University students and their psychological responses. Students personal health factor (BMI), personal perceptions (self-esteem, psychological well-being, and the weight specific QoL) was measured among the female students of the university. The sample of this study comprised of 500 female students enrolled in bachelors' programs at PNU. To have equal representation of health sciences campus and humanities campus data was divided in two equal halves (n1=250, n2=250 students). The Central student registration office was contacted to have updated and exact number of enrolled students at PNU. The Statistical power analysis of the sample size calculator was used to calculate representative sample of the study (Confidence interval=95%). Sample size was 383 but it was increased up to 500 for precautionary measure. Students having age range of 18-25 years (20.85±1.399, M±SD) were included. Those students who reported pregnancy or registered in diet control programs were not included. Moreover, students from the preparatory year program were also excluded.

Data for BMI was gathered by measuring weight and height of the students in accordance to the standards of World Health Organization (WHO, 2015). Health-related factors including physical exercise, chronic diseases, subjective assessment of health and body-image were measured by using various rating scales. Physical exercise rating scale (Lippke and Ziegelmann, 2005) is tapping the frequency of conducting exercise. Force choice items were used for chronic diseases (Yes or No). In case 'Yes' is the response then respondent has to specify what is a chronic disease with which she is suffering. The Five- point Likert rating scale was applied for the Subjective assessment of health (Weinstein, 2005). For body image participant were asked to reply "In general, how would feel about your appearance?" on five- point Likert rating (Poor=1, fair=2, good=3, very good, 5 excellent) scale.

Rosenberg Self-esteem Scale (Rosenberg, 1965) is one of the scale used world widely to measure self-esteem, self-image and sometime for self-worth. It has only 10 items having four-point Likert scale responses. Response options vary from strongly disagree to strongly agree. There are 5 items scored reverse (item 2, 5, 6, 8, 9). Scoring is in positive direction. There is no cut off score but higher scores indicate higher self-esteem. Rosenberg (1965), reported Coefficient alpha = 0.89 (n=5024 high school students), that is an indicator of good internal consistency and test-retest reliability. Arabic translated version of self-esteem scale reported internal consistency of α=0.71 (Kazarian, 2009). Zaidi *et al.,* (2015b) found the α=0.72 (n=500 normal sample of students) of Arabic version for the female student of PNU.

Brief Psychological Well-being Scale (PWB) measures psychological functioning as well as relationships and mastery. It is easy to administer and comprehend. It contains 10 items. A short version of the comprehensive scale. Response can be rated on 5-point Likert scale. There are five scoring categories ranging from very low to very high (10–50). Norms were developed with US respondents (Su *et al.,* 2013). Alpha Co-efficient of 0.92 was found in Arabic translated version (Zaidi *et al.,* 2015b).

Impact of weight on quality of life questionnaire, short-form (IWQOL-Lite) was developed by Kolotkin *et al.,* (2001). The scale is a short form of impact of weight on quality of life (Kolotkin *et al.,* 1995). It is self-report, the obesity-specific measure of health-specific quality of life. This scale will measure the main variable of weight specific QoL.

It consists of five sub scales namely physical function, self-esteem, sexual life, public distress, and work. Responses can be rated on 5-point Likert scale. Scoring can be done by acquiring sum score or scores for all the five sub scales. Strong psychometric properties were reported during the study of standardization (Kolotkin *et al.,* 1995). Items were stated in a negative direction, thus, higher scores indicate poorer

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weight specific quality of life. Arabic translated version study reported reliability of 0.72 (Zaidi *et al.,* 2015b).

In terms of ethical considerations all the requirement was fulfilled before and during conducting the study. Authors of the scales were contacted to sought permissions for the utilization of scales. Project was submitted to the Scientific Council of University for scientific and ethical permission. After getting ethical approval from Council, a letter was forwarded form College of Health and Rehabilitation Sciences, Research ethical committee (CHRS-REC) to all the concerned Heads of the Departments. This letter was explaining the objectives of research. Before starting to administer survey, a consent form was given to the participants.

After building rapport standardized scales were administered on individuals. Participants were assured about confidentiality of their information. Collected data was analyzed by using SPSS (V. 20). Descriptive Statistics of measures of central tendency and dispersion was calculated. Pearson's Product Moment Coefficient of Correlation was used to measure the relationship between the variables. Significance level of .05 was utilized to avoid error in human responses.

RESULTS AND DISCUSSION
Results
Table 1: BMI and Weight Specific QoL: Correlation and Descriptive Statistics (N=500)

Variables	BMI	Weight Specific QOL
BMI	-	
Weight specific QOL	.306**	-
M	24.16	46.47
SD	.097	1.10

**p < .01

Table 2: BMI, Weight Specific QoL, Self-Esteem and Wellbeing among Female Students: Correlation and Descriptive Statistics (N=500)

Variables	BMI	Weight Specific QOL	Self-Esteem	Wellbeing
BMI	-			
Weight specific QOL	.306**	-		
Self-Esteem	-.004	-.145**	-	
Wellbeing	-.531**	-.207**	.197**	-
M	24.16	46.47	29.14	37.49
SD	.097	1.10	1.47	0.52

**p < .01

Table 3: BMI, Weight Specific QoL and Health Related Factors: Correlation and Descriptive Statistics (N=500)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1)BMI	-					
(2) Weight specific QOL	.306**	-				
(3) Physical Exercise	-.022	-.131**	-			
(4) Chronic Diseases	.056	.027	.027	-		
(5) Subjective Assessment of Health	.027	-.094*	-.111*	.177**	-	
(6) Body-image	-.057	-.159**	-.077	.072	.437**	-
M	24.166	46.47	3.31	1.85	3.31	3.52
SD	.097	1.10	1.378	.429	1.021	1.154

**p < .01, **p < .05

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Results (Table 1) are showing Correlation between BMI and weight specific QoL (r=.306, p <.01) that is significant at the 0.01 level. Results are confirming the first hypothesis that there is significant correlation between body mass index and weight specific QoL. Descriptive statistics of Mean and Standard deviation are presenting for the variables of BMI (24.17±.097) and weight specific QoL (46.47±1.106). Results are showing that average BMI of the female university students is falling within normal range category. Mean score of weight specific QoL is also less than 50% of total score is indicating less distortion of perception toward weight specific QoL.

Table 2 is showing Correlation between BMI, weight specific QoL, self-esteem and wellbeing. BMI was found correlated with the weight specific QoL and negatively correlated with wellbeing (r=-.531, p<.01). In contrast, weight specific QOL was found negatively correlated self-esteem (r= -.145, p<.01) and wellbeing (r=-.207, p <.01) that is significant at the 0.01 level. Results are partially confirming the second hypothesis regarding BMI. Negative correlation between BMI and wellbeing was found. The weight specific QoL was found having negative correlation between the weight specific QoL, self-esteem and wellbeing. Results are also presenting descriptive statistics of mean and standard deviation for BMI, weight specific QoL, Self-Esteem (29.14±1.47) and Wellbeing (37.49±0.52). Mean of Self-esteem is showing that majority of the students' scores are falling in above average range. As far as wellbeing is concerned average responses are quite close to average range.

Table 3 is showing significantly negative correlation between weight specific QoL, physical exercise (r=-.131, p<.01), subjective assessment of health (r=-.094, p<.05) and body image (r=-.159, p<.01). All the correlations are significant on .01 level except subject assessment of health (p<0.05). Descriptive statistics are presented (Table 3) for health-related factors including physical exercise (3.31±1.378), chronic diseases (1.85±.429), subjective assessment of health (3.31 ±1.021) and body-image (3.52±1.154). Results are indicating that average respondents are having the frequency of exercise is once in a week. Majority of students are not having chronic diseases. Average response for subjective assessment of health was falling at good rating. Majority of the respondents perceived body image as very good.

Discussion

The relationship of BMI and weight specific QoL was found statistically significant but it is important to mention that score of weight specific QoL moves in negative direction (Kolotkin *et al.,* 2001). So, higher score on weight specific QoL indicates more distortion of perception toward weight specific QoL. Thus, the finding of study is confirming the previous studies in various cultures (Mikolajczyk *et al.,* 2010; Zaccagni *et al.,* 2014). The weight specific QoL is covering five major aspects of life including physical function, self-esteem, marital life, public distress and work. Thus, all these domains of life will have overall major impact if a person having over weight or obesity. Moreover, overweight can interfere not only with quality of life but also leads toward psychological problems (Viner *et al.,* 2006).

BMI was found correlated with the variable of weight specific QoL and wellbeing. It was discussed that BMI and quality of life are closely related that shows indirect or complex relation of BMI with psychological constructs. One study conducted with women who joined weight control program, documented similar findings. Psychological wellbeing was found lower among overweight and obese female (Vieira *et al.,* 2012). Further current finding has proven the relationship among the weight specific QoL, self-esteem and psychological wellbeing. The Relationship of perceived weight with self-esteem and mental health is reported frequently in literature (Ali *et al.,* 2010; Habib *et al.,* 2015). It can be inferred that self-esteem and wellbeing will be higher if the perception of weight remains intact. In other word, if weight has less interference in physical mobility, self-esteem, marital life, public distress or during work, it may lead to higher self-esteem and wellbeing. In most of the studies (Wardle and Cooke, 2005; Viner *et al.,* 2006; Fulkerson *et al.,* 2007) BMI was found related to wellbeing. This study also provide the relation of BMI and the weight specific QoL with wellbeing as well.

Finding related to third hypothesis are indicating of partial approval. BMI was found having no correlation with physical exercise, chronic diseases, subjective assessment of health and body image. One of the reason of no relation might because of normal student population. Majority were having normal

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category of BMI. Results might be different if study can be replicate with older women having health problems. One of the evidence found in previous studies can support to explain the results. Although study was conducted with adolescents. Researchers found that subjective body-image was predicting self-esteem and satisfaction with life. BMI was not directly related with psychological constructs but in the development of body-image perception (Tabak *et al.,* 2007).

Thus, the relationship of BMI and weight specific QoL can contribute to develop healthy or unhealthy life patterns. As compare to BMI, the weight specific QoL is having statistically significant negative correlation with most of the health factors including physical exercise, subjective assessment of health and body image (Wardle *et al.,* 2006; Kakeshita and Almeida, 2006; Pietilainen *et al.,* 2008; Kearns *et al.,* 2014).

Conclusion

In conclusion, study is revealing valuable information regarding relationship of actual weight and weight perceptions among female university student at KSA. To promote health, it is necessary to initiate with psychological variables of self-esteem, psychological wellbeing and eight specific QoL that will further strengthen behavioural aspects. The study provided venues for future research. In future, psychological constructs of self-esteem and wellbeing might be studied as mediating factors with relation to BMI and quality of life.

Health related quality of life can be replaced the weight specific QoL among hospitalized population. A comparative pre-post study of wellbeing and weight specific QoL can reveal that if Health sciences programs can have influential factors on the perceptions of medical students. It is recommended to promote on the teaching level for the building of basic concepts of healthy life style within students and make their quality of life better and healthier.

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