

## **Development of Attitude Towards Obesity Scale and Obesity Myths Scale**

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Present study aimed to develop and validate the Attitude toward Obesity Scale and Obesity Myths Scale through Exploratory Factor Analysis (EFA) and resulting factor structure was confirmed through Confirmatory Factor Analysis (CFA). Sample of EFA comprised of adults ( $N = 300$ ) including men ( $n = 144$ ) and women ( $n = 156$ ) with the age range of 18 to 36 years ( $M = 21.53$ ,  $SD = 2.65$ ). A factor loading of .35 was set as selection criteria for an item in the scale. Using oblique rotation method, EFA presented two meaningful factors for Attitude Toward Obesity Scale and for Obesity Myths Scale. Attitude Toward Obesity Scale revealed two factors named as Lifestyle of Obese (7 items) and Qualities and Characteristics of Obese (7 items). Similarly, for Obesity Myths Scale, two factors named as Weight Control Myths (5 items) and Negative Characterization Myths (5 items) were emerged. For CFA, sample of 430 students including men ( $n = 180$ ) and women ( $n = 250$ ) of age range from 19 to 40 years ( $M = 21.62$ ,  $SD = 3.13$ ) were taken. CFA confirmed the factor structure of both scales. Alpha reliabilities were ranged from .61 to .67 for Attitude Toward Obesity Scale and from .50 to .57 for Obesity Myths Scale. Overall, both instruments emerged as reliable and valid measures to assess the explicit attitude and myth related to obesity in Pakistani culture.

*Keywords:* attitude toward obesity, obesity myths, exploratory factor analysis, confirmatory factor analysis

Obesity is considered as most serious emerging public health issue in 21<sup>st</sup> century among children, adolescents, and adults (Güngör, 2014). Developing countries are increasingly becoming susceptible to the worldwide epidemic of obesity, which affects all ages and socioeconomic groups (Abdulai, 2010; Friedrich, 2002). National Health Survey of Pakistan conducted between 1990 and 1994, reported that, Pakistan is facing the burden of both over nutrition and

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under nutrition and acute changeover from communicable disease to non-communicable diseases (Dennis et al., 2006). Even though obesity is emerging as prevalent diseases among non-communicable diseases, it is still underexplored phenomenon (Tanzil & Jamali, 2016). Along with increasing risk factors for physical health (Carlsson et al., 2016; Crump, Sundquist, Winkleby, & Sundquist, 2016), many psychological concerns are associated with obesity including unhealthy eating pattern, extreme weight control behavior, depressive symptoms, impaired social life, and low quality of life regarding health (Brownell & Walsh, 2017; Puhl & Suh, 2015).

Prejudice and stereotypes are highly salient for individuals with increased body weight (Jackson, 2016; Phelan et al., 2015). Negative attitude against obese and overweight people is pervasive in nature and negative weight bias is even considered as last acceptable form of discrimination (Kelly & Stapleton, 2015). Negative attitude toward obese and overweight people is referred as beliefs, assumptions, and judgments toward individuals who are overweight and obese (Washington, 2011). Negative attitude among obese and overweight population involves one of two components including a) stigmatization and shame, which may motivate them to lose weight (Alberga, Russell-Mayhew, von Ranson, & McLaren, 2016); or b) the belief that lack of self-discipline and weak will power is reason for obesity (Ratcliffe & Ellison, 2015). The synonymous terms used interchangeably for reflecting negative attitude toward obese individuals in literature are 'weight stigma,' 'weight bias,' and 'weight prejudice' (Diedrichs & Puhl, 2016; Lacroix, Alberga, Russell-Mathew, McLaren, & von Ranson, 2017).

Negative weight related attitudes are manifested through stereotypes (e.g., lazy). This results in rejection, for example, ignoring overweight people, and prejudice for example, giving job preference to slim people as compared to overweight (Brownell, Puhl, Schwartz, & Rudd, 2005; Puhl, Moss-Racusin, Schwartz, & Brownell, 2007). Puhl and Brownell (2001) highlighted that discrimination against obese people is affecting almost every area of their lives including employment, education, healthcare facilities, and interpersonal relationships. They also pointed out that mostly, obese people receive negative comments and feedback from doctors, friends, and family members and encounter with physical barriers and obstacles. These findings are consistent with other researches on samples of both men and women (Carr, Friedman, & Jaffe, 2007). Studies also show that negative attitudes and stereotypes about obese people exist on both explicit and implicit level (Hofmann, Gawronski, Gschwendner, &

Schmitt, 2005; Schwartz, Chambliss, Brownell, Blair, Billington, 2003; Teachman, Gapinski, Brownell, Rawlins, & Jeyaram, 2003).

Individualistic cultures are more prone to biasness toward overweight and obese people because of negative cultural values of fatness and attribution of personal responsibility of weight as compared to collectivistic culture (Crandall et al., 2001). Puhl and Suh (2015) conducted a study to understand the negative weight biased attitude across Canada, Australia, United States, and Iceland. Findings suggest that attribution of personal responsibility, lack of will-power and behavioral causes of obesity are common in all countries. Weight bias is higher among those who believed that weight is due to sedentary lifestyle and overeating as compared to other factors which are not in personal control (i.e., genes & environment).

Myths are false beliefs which are considered true despite extensive contradicting evidences. Human beings have tendency to seek explanations for observed phenomena, and everyday experiences appear to contribute to strong convictions about obesity, despite the absence of supporting data. Spreading of false beliefs about obesity and overweight people on media and in government agencies results into ineffective policy and unsafe public health recommendations (Casazza et al., 2013).

Mauler et al. (2009) suggested that misconceptions about obesity hampered the quality of healthcare for the obese in recent years. They further argued that media and diet faddists contributed to these misconceptions. Among the common misconceptions about obesity, first is that body weight is acquired by food habits and physiologically regulated variable play less role. This misconception suggests that selection of right diet can set the weight of person to his or her desired level without suffering from adverse health issues in the process. Lack of physical activity and poor eating habits are considered as key factors contributing in obesity and targeted by various preventive programs, however, evidence only from correlational studies justify the importance to these factors, while experimental studies are not supporting these notions (Chaput, Ferraro, Prud'homme, & Sharma, 2014; Sørensen, 2009).

Kwan (2009) suggests that obesity and overweight are not just medically defined facts, but they are social issues and various groups in society help to understand the phenomenon. He suggested that medical frame define health in narrow frame and obese individuals are considered as blameworthy and promote the thinness. Medical frame dominates in constructing perception and beliefs about obesity.

Cultural meanings regarding the body size and fatness play important role in defining the shape identities (Bordo, 2004; Brown & Konner, 1987; Swami, 2015). Human bodies are construction and reflection of society's beliefs and norms. These norms create the affiliation or alienation from prevalent social norms for example, slimness (Schrimpf et al., 2018). In industrialized countries, slimness is idealized and associated with intelligence, attractiveness, youth, health, goodness, and beauty (Becker & Hamburg, 1996; Puhl et al., 2007). Whereas, in contrast obesity and fatness are not only linked with negative characteristics such as ugliness and undesirability but also with moral weakness, such as a lack of self-control, incompetence, laziness, and social irresponsibility (Becker & Hamburg, 1996; Cordell, & Ronai, 1999; de Vries, 2007; Grogan & Richards, 2002).

Weight bias and prejudice are spreading globally, even in cultures which are traditionally considered to show little weight related stigmatization; however, expression of this stigma explicitly is not acceptable in some cultures. In each culture, wide range of sociological contexts play role, therefore, it is important to assess the nature of fat stigma because wide range of sociological contexts influence the physical and social well-being of obese people (Brewis, Wutich, Falletta-Cowden, & Rodriguez-Soto, 2011).

In Pakistan most of the researches are conducted to explore the psychological consequences associated with obesity. Rizwan (2013) found that high Body Mass Index (BMI) among obese people is linked with high level of internalized self-criticism than their non-obese counterparts in same environmental conditions. A study conducted by (Rafeeh, 2017) indicated that perceived weight stigmatization negatively predicted mental health among university students and cognitive reappraisal positively predicted mental health. Relationship between BMI and positive mental health was found to be mediated by perceived social rejection. Weight bias internalization also mediated between perceived stigmatization and positive mental health. Her results also showed that women were high on perceived social rejection, but perception of weight bias stigmatization was equal among both genders. Another study conducted by Bibi (2013) suggested that high BMI is related with depression and poor quality of life. Low socio-economic status and being female is more related with poor quality of life in case of high BMI index.

Association of negative moral meanings of fatness in any culture anticipates increasing vulnerability to fat stigma and negative attitudes (Brewis et al. 2011). Cross-cultural studies are needed to better establish the extent, nature, similarities or differences, antecedents,

and outcomes of negative attitude toward obese people. It is possible that even if levels of bias were similar across countries, different predictors may underpin bias in different cultures. Such research could also help inform weight stigma-reduction interventions, and nature of attitude toward obese people. Moreover, negative consequences associated with weight biasness warrant our attention for the assessment of attitude toward obesity and beliefs that shape the attitude. Myths and misperception play a wide role in shaping the attitude of people toward obese people and obesity. So, it is important to study obesity myths for complete understanding of attitude toward obesity. For assessment of negative attitudes and myths related to obesity, already available measures were reviewed. There were no indigenous measures available in Pakistan for the assessment of attitudes and myths toward obesity. Scarcity of literature and understanding of indigenous aspects on above constructs prompted for the development of attitude and myths toward obesity scales. Qualitative study was done before and findings were utilized for the development of psychometrically reliable and valid scales attitude toward obesity. Following were the objectives of the present study:

1. To develop the Attitude towards Obesity Scale and Obesity Myths Scale.
2. To establish the construct validity of Attitude towards Obesity and Obesity Myths scales.

## **Method and Results**

Present study was conducted into two phases. In Phase 1, Attitude toward Obesity Scale and Obesity Myths Scale were developed while in Phase 2, factor structure of both scales was established, and psychometric properties were determined. Following is the detail of each phase:

### **Phase 1: Development of Attitude Towards Obesity Scale and Obesity Myths Scale**

This phase was carried out in following three steps:

**Step 1 - Generation of Items Pool.** Qualitative exploration was done for items pool generation. Qualitative exploration included five focus group discussions with adult men and women ( $N = 42$ ), five qualitative interviews with obese/overweight people and four

qualitative interviews with experts in field of nutrition. Major themes were identified as eating habits and obesity, physical appearance of obese, socialization, personality attributes and characteristics of obese, sedentary lifestyle, and obesity myths. Along this, literature on attitude toward obesity was also explored. In items pool, statements which had no rational basis and not true as per medicine field were included. Items pool for attitude toward obesity comprised of 40 items of 5-point Likert scale ranging from *strongly agree* (1) to *strongly disagree* (5). Similarly, the response categories of myths toward obesity were *absolutely wrong* (1) to *absolutely correct* (5) and total 18 items were included in item pool for Obesity Myths Scale. Total for Attitude towards Obesity scale and Obesity Myths scale can be computed by summing the all items and high score reflects the positive attitude toward obese people and high score on Obesity Myths Scale indicates that person has strong belief on obesity myths.

**Step 2 - Items Evaluation from Experts.** Judge's opinion was sought regarding the appropriateness of items in this step. For this purpose, three researchers (Ph. D in Psychology) were contacted and requested to review each item carefully for language appropriateness, overlapping, construct relevance, face validity, and unclear items. As a result of consensus among three judges, 35 out of 40 items were retained. Ten items of Attitude Toward Obesity scale were reversed scored. Obesity Myths Items pool consisted of 18 items which were first evaluated by nutritionists for the confirmation of myths in Pakistani culture. Afterwards, judge's opinion was taken and 3 out of 18 items were dropped from Obesity Myths items pool. All these items were positively worded.

**Step 3 - Factor Structure of Attitude Toward Obesity Scale and Obesity Myths Scale Through Exploratory Factor Analysis (EFA).** In this step, factor structure and psychometric properties of Attitude Toward Obesity Scale and Obesity Myths Scale were determined through EFA.

**Sample.** A sample of 300 adults containing men ( $n = 144$ ) and women ( $n = 156$ ) from colleges and universities (i. e., Viqar-un-Nisa College, F-7/2 Girls college, Islamic University, Quaid-i-Azam university and NUML university). Usually, it is considered that universities of Islamabad have general representation of students from all provinces of Pakistan. Sample consists of both men ( $n = 140$ ) and women ( $n = 190$ ) with the age ranging from 18 to 36 years ( $M = 21.53$ ,  $SD = 2.65$ ) with the education from BS to MA level. While collecting the data, convenient sampling technique was used.

**Procedure.** Data was collected from university students from universities and colleges of Islamabad and Rawalpindi. Firstly permission from head of institutes was taken and then participants were approached in their classrooms for group administration. After getting inform consent, scales were administered. Participants were instructed to read each statement carefully and respond honestly to all items of the scales. They were assured by the researcher that information will be used for research purpose and will kept confidential. At the end, they were thanked for their cooperation.

**Results.** Principal Component Analysis with Direct Oblimin Rotation was performed to explore the factor structure of Attitude Toward Obesity Scale and Obesity Myths Scale. The number of factors were determined based on Eigen values greater than 1 and scree plot (Kim & Mueller, 1978). The value for Kaiser Myer Olkin (KMO) was obtained as .80 which is an indicator of sampling adequacy. Bartlett test of Sphericity value was  $\chi^2 = 1040.806$  significant at  $p < .000$  showed that correlations are compact enough to generate distinct and reliable factors. Initially, Principle Component Analysis was performed with three factor solutions, however, ended up with two meaningful factor solution. Item total correlations were also computed and three items were deleted on the basis of weak correlation.

Principal Component Analysis with Direct Oblimin Rotation and Scree plot were used to explore the factor structure of Obesity Myths Scale. Value of KMO was achieved as .79 which is in indicators of sampling adequacy. Bartlett test of Sphericity value was  $\chi^2 = 1040.806$  significant at  $p < .000$  showed the correlation between items were sufficiently large. Direct Oblimin method were used for rotated factor solution. Item total correlation for Obesity Myths Scale was strong for all items.

Table 1 shows that overall 14 items are loaded on two factors for Attitude Toward Obesity Scale (ATOS). Items with .35 or above are retained in corresponding factors and less than .35 have been excluded. ATOS explained 30 % variance and all items are positively worded. Scree plot (Figure 1) is indicating the two factors of Attitude Toward Obesity Scale. The items in two subscale were labeled with the help of five research experts (Ph.D) as 'Lifestyle of Obese' and 'Qualities and Characteristics of Obese'.

Table 1  
*Factor Loadings of Attitude Toward Obesity Scale With Direct Oblimin Rotation (N = 300)*

Sr. No	Item No.	F1	FII	$h^2$
1	1	<b>.47</b>	-.14	.30
2	2	<b>.51</b>	-.09	.37
3	3	<b>.60</b>	.13	.35
4	5	<b>.66</b>	.01	.40
5	8	<b>.62</b>	.16	.42
6	12	<b>.58</b>	.05	.36
7	14	<b>.40</b>	.13	.30
8	4	.16	<b>.40</b>	.30
9	6	.13	<b>.60</b>	.30
10	7	.12	<b>.52</b>	.47
11	9	-.00	<b>.50</b>	.40
12	10	-.03	<b>.66</b>	.41
13	11	.03	<b>.61</b>	.30
14	34	-.11	<b>.40</b>	.50
Eigen values		2.27	2.21	
% of variance		16.24	13.78	
Cumulative %		16.24	30.02	

Note. F I = Factor I; F II = Factor II.

Boldface are the items with .35 or above in respective factors.

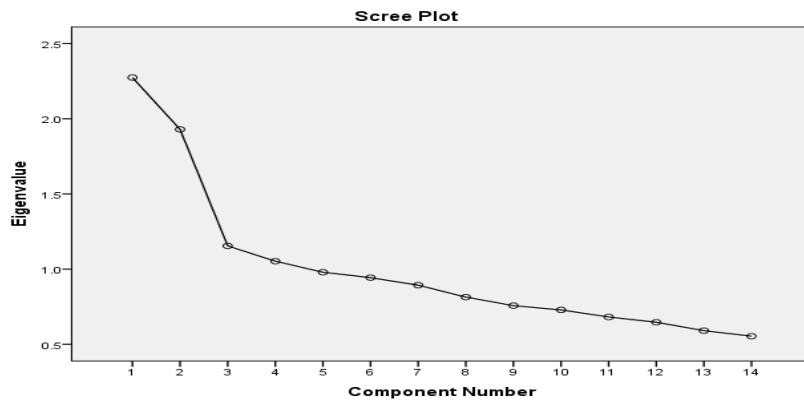


Figure 1. Scree plot suggesting factors for Attitude Toward Obesity Scale.

As shown in Table 2, 10 items are retained on two dimensions of Obesity Myths Scale (OMS). Items with .35 and above loadings are retained and explained the 35.73% variance. Final version of OMS consisted of 10 positive worded items with two subscales 'Weight Control Myths' and 'Negative Characterization Myths'. Scree plot (Figure 2) is also clearly showing these factors.



Table 2  
*Factor Loadings of Obesity Myths Scale With Direct Oblimin Rotation (N = 300)*

Sr. no	Item no	F 1	F II
1	8	<b>.65</b>	.09
2	9	<b>.64</b>	.01
3	6	<b>.60</b>	-.09
4	7	<b>.50</b>	-.06
5	5	<b>.47</b>	.13
6	14	-.13	<b>.68</b>
7	10	-.10	<b>.64</b>
8	4	.06	<b>.62</b>
9	15	.27	<b>.43</b>
10	13	.07	<b>.35</b>
Eigen value		2.23	1.34
% of variance		22.31	13.41
Cumulative %		22.31	35.73

Note. F 1 = Factor 1; F II = Factor II.  
 Boldface are the items with .35 or above in respective factor.

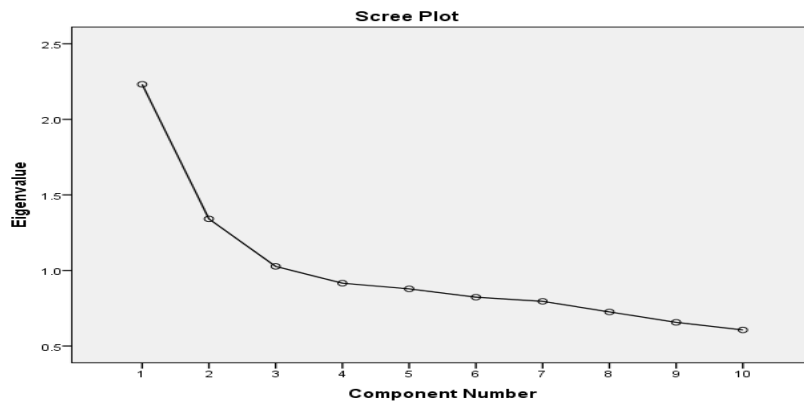


Figure 2. Scree plot for matrix of Obesity Myths Scale.

**Phase II: Validation of Scales Through Confirmatory Factor Analysis**

This phase was carried out in following two steps to establish the construct validity of scale and to determine the psychometric properties of scale:

**Step 1.** This step was carried out to confirm the proposed factor structure of Attitude toward Obesity and Obesity Myths Scale through CFA.

**Sample.** A sample of 430 adults from different colleges and universities were approached through convenient sampling technique. Study included 180 men and 250 women with age ranging from 19 to 40 ( $M = 21.62$ ,  $SD = 3.13$ ) years. Information about demographics regarding age, education, family system, walk routine was taken. Weighing machine was used to take weight status and height was also manually calculated.

**Procedure.** Data was collected after seeking permission from authority in different educational institutes of Rawalpindi and Islamabad. Convenient sampling strategy were used. After getting the consent, questionnaires were handed over to participants and informed about the research purpose and debriefed later. Confidentiality of data was assured, and they were thanked for their cooperation in the end.

**Results.** Confirmatory factor analysis for ATOS confirmed the two-factor solution obtained in EFA. Initially hypothesized CFA for 14 items of ATOS yielded significant  $\chi^2(df = 76) = 92.85$ . Fit indices i.e., CFI = .94, NFI = .80, TLI = .93, RMSEA = .02 were also obtained. Initially, the value of NFI was slight lower than criteria. Seven covariance were drawn between e2-e4, e2-e12, e3-e9, e4-e9, e9-14, e10-14, e11-14. After that value of NFI  $\chi^2(df = 73) = 74.99$ ; CFI = .99; NFI = .90; TLI = .99; RMSEA = .01 was improved, hence, model 2 provided better evidences for of ATOS. The standardized loadings for both scales are given below.

Finding in Table 4 shows the same results of CFA as that of EFA carried out in Phase 1. Factor loadings on all items for ATOS are greater than above .35 loading on two factors except the item 4, 13, and 1. After qualitative examination, these items were retained because of their qualitative importance in scale and further deletion of items did not improve the reliability of scales.

Table 4

*Factor Loadings (Standardized Regression Weights) for Two Factors of Attitude Toward Obesity Scale (N = 430)*

Lifestyle of Obese			Qualities and Characteristics of Obese		
Sr.no	Items	Factor loading	Sr.no.	Items	Factor loading
1	4	.33	8	1	.32
2	6	.57	9	2	.45
3	7	.46	10	3	.42
4	9	.39	11	5	.60
5	10	.62	12	8	.46
6	11	.53	13	12	.40
7	13	.31	14	14	.43

Results of confirmatory factor analysis for Obesity Myths Scale confirmed two factor solution for 10 items. Model fit indices of model 1 indicates significant  $\chi^2 (df = 34) = 64.98$  at  $p = .001$  which can be possible justification for rejection of null hypothesis. Fit indices i.e., CFI = .84, NFI = .80, TLI = .79, RMSEA = .03 indicates poor model fits. Model 2 represents modified CFA model while adding error covariance between e1-e6, and e9 – e10.

After adding covariance significant differences observed in the  $\chi^2 (df = 34) = 42.05$ . Significant change in chi-square with decreased degree of freedom is a sign model 2 is better than model 1 with improvement in fit indices that is, value of CFI = .93, NFI = .90, TLI = .90 were improved in second model.

Table 5  
*Factor Loadings of Obesity Myths Scale (N = 430)*

Weight Control Myths			Negative Characterization Myths		
Sr.no	Items	Factor loading	Sr.no.	Items	Factor loading
1	5	.37	9	14	.35
2	6	.36	7	10	.36
3	3	.37	8	1	.40
4	4	.43	9	10	.69
5	2	.41	10	8	.47

Table 5 shows the same results of CFA as that of EFA carried out in phase. All the items are greater than above .35 loading on two factors for OMS.

**Step II.** This step was carried out to understand the reliability, descriptive statistics, and differences of gender on Attitude Toward Obesity Scale and Obesity Myths Scale.

Result in Table 6 show the alpha coefficients of Attitude Toward Obesity scale are in acceptable range. While for Obesity myths scale reliabilities are quite low. Variability of responses on myths scale can be reason for low reliability; individuals who have belief on one myth may or may not belief other statements on Obesity Myths Scale. Skewness and Kurtosis values indicates the normal distribution of data.

Table 6

*Descriptive Statistics of Attitude Toward Obesity Scale and Obesity Myths Scale (N = 430)*

Scale	Items	M	SD	$\alpha$	Ranges		Skewness	Kurtosis
					Potential	Actual		
ATOS	14	42.66	7.22	.67	14-70	23-63	-.10	-.10
LSO	7	17.97	4.86	.64	7-35	7-31	-.19	-.19
QCO	7	24.68	4.84	.61	7-35	12-35	-.12	-.62
OMS	10	28.67	6.28	.58	10-50	12-47	.15	-.07
WCM	5	16.09	3.95	.51	5-25	5-25	-.19	-.25
NCM	5	12.58	3.97	.51	5-25	5-24	.25	-.39

*Note.* ATOS = Attitude Toward Obesity Scale; LSO = Lifestyle of Obese; QCO = Qualities and Characteristics of Obese; OMS; Obesity Myths Scale; WCM = Weight Control Myths; NCM: Negative Characterization Myths.

Table 7

*Comparison of Gender on Attitude Toward Obesity and Obesity Myths Scale (N = 430)*

Variables	Men (n = 180)		Women (n = 250)		t	p	95 %CI		Cohen's d
	M	SD	M	SD			LL	UL	
ATOS	52.48	9.58	53.14	9.43	-.70	.48	-2.48	1.17	.06
LSO	28.76	7.74	27.76	7.35	1.36	.17	-.44	2.44	.13
QCO	23.72	5.03	25.38	4.59	-3.49	.00	-2.51	-.72	.34
OMS	29.70	6.41	28.05	6.18	2.69	.00	.44	2.86	.26
WCM	16.93	4.00	15.49	3.86	3.77	.00	.69	2.20	.36
NCM	12.76	4.08	12.56	3.93	.52	.59	-.56	.97	.04

*Note.* CI = confidence interval; LL = lower limit; UL = upper limit; ATOS = Attitude Toward Obesity; LSO = Lifestyle of Obese; QCO = Qualities and Characteristics of Obese; OMS = Obesity Myths; WCM = Weight Control Myths; NCM = Negative Characterization Myths.

Table 7 is showing the gender differences on both scales and their subscales. Findings show that women have more positive attitude toward Qualities and Characteristics of Obese as compared to men. While on Obesity Myths and Weight control Myths, men score high as compared to women.

## Discussion

Current research aimed to develop the instrument to assess the attitude toward obesity and related myths in our culture. Previous studies have documented negative consequences of attitudes and

myths with health and wellbeing of obese people including low self-esteem, symptoms of depression, increased risk factor for anxiety disorder (Annis, Cash, & Hrabosky, 2004; Carr et al., 2007) body image dissatisfaction (Rosenberger, Henderson, & Grilo, 2006; Vartanian & Shaprow, 2008) and report poorer life satisfaction and quality of life (Jackson, Beeken, & Wardle, 2015).

A variety of measures have been developed to assess attitudes toward fat people in western literature. These measures have varied theoretical perspectives, some instruments assessed the global attitude with reference to personal fear of fatness and focused on anti-fat attitude, while others focused more on social attitudes about persons who are overweight or obese (Lacroix et al., 2017). In Pakistan, there is scarcity of literature in assessing attitude toward obese and no indigenous measure was available to assess the attitude toward obesity and prevalence of obesity myths. Hence, the study aimed to develop indigenous measures. For Attitude Toward Obesity Scale item pool of 35 items and for Obesity Myths Scales, 15 items were used on the sample of 300 adults. Additionally, for the construct validity and empirical evaluation of scales, confirmatory factor analysis was applied.

The factor analysis revealed that 14 out of 35 items were clustered into two factors for Attitude Toward Obesity Scale which explained 30 % variance and for Obesity Myths Scale it was, 35% with two factor solution. Items having factor loading  $> .35$  in both scales were retained. It is logical to retain those factors who have Eigen values greater than 1 (Field, 2005), On the basis of above-mentioned criteria, 14 items were finally selected, and it was determined that construct of attitude toward obesity is multidimensional in nature. One factor was 'Lifestyle of Obese People' reflecting the attitude about the routine and activities of obese people. It includes the attitude about the eating pattern and routine activities of obese people. High score reflects the positive attitude toward obese people. Second factor was emerged as 'Qualities and Characteristics of Obese People'. In this factor, most of the items reflected the attitude about the abilities of obese, their personal life and association with weight. Sedentary lifestyle and personality characteristics that is, lazy, weak will-power, inconsistent routine, low self-esteem and physical unattractiveness. Previously, Allison, Basile, and Yunker (1991) and Lewis, Cash, and Bubb-Lewis (1997) also developed a multidimensional scale to assess the attitude toward obesity and fatness. Present findings are in accordance with previous literature (Allison et al., 1991; Crandall, 1994; Lewis et al., 1997).

Another important finding was emergence of obesity myths that is closely related to attitude toward obesity. Myths regarding the association of obesity with less intelligence and with money earning through illegal way were indigenously identified. Other controllability belief about obesity and health consequences and weight control myths were in association with available literature on obesity stereotypes (Ramos-Salas, Forhan, & Sharma, 2014). On Obesity Myths Scale, result of factor loading showed a two-factor solution. First factor 'Weight Control Myths' represents the myths regarding the weight control or management. Mostly items were reflecting the misperception that how weight can be controlled. Second subscale 'Negative Characterization Myths' was related to negative characterization based on obesity. It includes the stigmatized attitude toward obesity. Evidences on obesity myths scale were not found in western literature as no psychological measure were available, however, factor structure is recommended for the myths scale i.e., *Hijra* Myths (Jami, 2012) and Career Myths Scale (Stead & Watson, 1993). Overall, 10 myths were identified, and each subscale contained 5 items. Confirmatory factor analysis was carried out to confirm the factor structure.

Reliability estimates were also computed to validate the instrument on the basis of factor analysis. The result showed the alpha coefficients for ATOS ranged from .61 to .67. While developing the scale in psychology, researcher cover the broader aspects of psychological construct and concepts. For this purpose, researchers usually focus increasing number of items to assess that domain (Brunner & Süß, 2005). Items in the Unidimensional scales measure the single attribute, as compared to multidimensional scales in which complex interpretation is required. In practice, assumption of unidimensionality is violated by assessing the reliability of multidimensional scale through Cronbach's alpha coefficient (Widhiarso & Ravand, 2014). Attitude toward obesity is also a heterogeneous construct in which items measure the broad level of attributes related to the attitude toward obesity. Multidimensionality could be a reason of low reliability. Moreover, in already established measures for example, Attitude Toward Obese Person Scale, reliability ranges from .62 to .68 were reported (Dedeli, Bursalioglu, & Deveci, 2014). In Anti-fat Attitude test, Crandall and Biernat also reported alpha coefficient of .65. Alpha coefficient for Obesity Myths scale was quite low. One explanation could be that stereotypes are cognitive schemas that are fluid in nature which might have affected the reliability. Neilands, Steward, and Choi (2008) also reported the low reliability on a scale measuring stigma towards homosexuality

and rationalized that less number of items and endorsement on few type of myths can be reason for low reliability. Moreover, Jami (2012) also reported low reliability on *Hijra* Myths Scale and explained that heterogeneity of sample and variability of responses as possible reasons. For Obesity Myths scale, alpha coefficient was not significantly improved after removing the items subsequently so all items in scale were retained.

Significant gender differences were found on Qualities and Characteristics of Obese subscale, Obesity Myths Scale and Weight Control Myths subscale. Women showed more positive attitude toward qualities and characteristics of obese (Latner, O'Brien, Durso, Brinkman, & MacDonald, 2008). On obesity myths and weight control myths, men scored high as compared to women. Literature in Pakistan with reference to belief on myths regarding, *Hijra* myths, rape myths, and food myths indicated the same findings. This show that men have more traditional attitude and beliefs and want to maintain these attitudes as in patriarchal society. Strong belief on myths can lead to traditional attitude though which they can maintain their power over own house and preserve the cultural values (Jami, 2012; Naqvi, 2017).

### **Limitations and Suggestions**

Despite the usefulness of present study in Pakistan, few limitations have also been observed. Current study put emphasis on assessing the explicit attitude toward obese people which can be affected by social desirability. Future researchers can focus on assessment of implicit type of attitude for better understanding of attitudes toward obese people. Obesity Myths Scale is a valid tool to measure relative strengths of belief, however, reliability estimates were low that needs to check for future research work.

### **Conclusion and Implications**

Overall, both measures emerged as reliable and valid for assessing the attitudes and myths related to obesity in Pakistan. Availability of these measures can help the future researchers to identify the predictors and outcomes related to this phenomenon in Pakistani culture. Identifying the negative attitude toward obese will be important step to reduce biasness in different settings (educational, interpersonal, job hiring). Furthermore, identification of obesity myths

is also an important source for developing awareness programs to increase knowledge and raise the awareness about obese and overweight people which can further help in reducing the negative attitude toward obese people.

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