Original Article

Validity and Reliability Study of Modified Weight Bias Internalization Scale in Turkish

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Abstract

Introduction: This study aimed to adapt an English version of the Modified Weight Bias Internalization Scale, which evaluated the internal bias reflecting the internal experiences of individuals in different weight categories for the Turkish public.
Methods: This methodological study was conducted with 279 students in different weight categories at Ataturk University Faculty of Health Sciences. Item-total correlations, test-retest, Cronbach's alpha coefficient, and factor analysis were used to analyze
the validity and reliability.
Results: Results indicate that the scale had high internal consistency (Cronbach's alpha =0.92). According to their weight categories, the total Weight Bias Internalization Scale score was found as overweight–obese (3.17±1.42), higher than underweight and (2.34±1.11), underweight higher than normal weight (2.12±1.18).
Conclusion: The Modified Weight Bias Internalization Scale was a valid and reliable instrument. The scale's Turkish form can be used in Turkey to evaluate the internal biases and
stigma related to body weight.

Key Words: Weight, bias, scale, validity, realibity, psychiatry

Introduction

Obesity is an important health problem becoming more and more widespread all over the world and primarily in developed countries and also in Turkey and affecting children as well as adults (Çam&Engin,2014). According to the data of the WHO, there are more than 400 million obese people and 1.6 billion mildly overweight people in the world.

Obesity leads not only to physiological problems such as cardiovascular diseases, endocrine diseases and cancer, but also to psychosocial problems such as the individual's life quality, self-esteem, mood, and eating disorders (Durso&Latner,2008). Another factor that affects the life quality of an obese individual is the attitudes and prejudices of the society towards the weight as attitudes and prejudices cause bias. The number of studies on obesity-related bias is limited, because compared to other stigmatized conditions (mental disorders, infertility, Aids, etc), obesity-related stigma is considered as normal and acceptable in society (Maclean et al., 2009). Bias is any attribution reducing an individual's esteem referred by other individuals in the society as the person in question is considered beyond the normal criteria specified by the society (Puhl&Heuer,2010). Studies have demonstrated that obese individuals are faced with stigma and bias in many phases of their lives (Davison & Birch, 2004; Puhl & Latner, 2007; Puhl, Moss-Racusin, & Schwartz, 2007). The society's bias and general negative viewpoint towards obese people affect negatively this group's social relationships, promotion status in

their professional lives and their education, and lead to difficulties in finding jobs and being forced to work for lower wages than non-obese people; therefore, this also increases the social cost of obesity. Description of these individuals as lazy, weak, incontinent, unattractive and with less self-control especially in media and bringing the concept of leanness in western societies lead to exclusion of obese individuals from society, various negative labels and bias(Maclean et al., 2009; Puhl & Latner, 2007; Puhl, Moss-Racusin, & Schwartz, 2007).

Previous studies have determined significant correlations between high depression, low self-esteem, suicide attempts, unhealthy weight control, and body dissatisfaction among individuals who feel they are stigmatized due to their weight (Schamer et al., 2008; Schey &White, 2015; Wang, Brownell, & Wadden, 2004).

Internalized weight bias includes one's biases against themselves; however the basis of these biases is shaped by the prejudices of society against overweight (Puhl et al., 2007). Internalized weight bias is to accept society's negative stereotypes about one's self and consequently to withdraw oneself from society due to negative emotions such as unworthiness and embarrassment. Previous studies have determined a positive correlation between internalized weight bias and depression and body dissatisfaction and a negative correlation between internalized weight bias and self-esteem level(Carels et al., 2010; Puhl & Heuer, 2009; Seacat & Mickelson, 2009). Internalized biases have been proved to lead to maladaptive eating habits and result in low motivation to exercise and also more unsuccessful outcomes to lose weight. A positive significant correlation has also been found between internalized weight bias and eating more (Vartanian & Shaprow, 2008; Wott & Carels, 2010).

Negative effects of internalized weight bias have started to be studied further in recent years. Weight Bias Internalization Scale (WBIS), developed by Durso and Latner (2008) for the first time, evaluates the "internal stigma" reflecting the internal experiences of obese individuals related to stigma. Later on, the scale was redeveloped by Pearl and Puhl (2014) using only the statement "because of my weight" instead of "because I am overweight" in the original scale, suggesting that internalized bias can be encountered among slim individuals as well as overweight or obese individuals. No study examining the experiences of individuals related to internalized weight bias has been found in Turkey. The most important reason for this lack of studies is the absence of a reliable and valid assessment tool evaluating internal stigma in Turkey. This study, fundamentally, was conducted to fill this deficiency. In this study, which aims to introduce an assessment tool to researchers interested in this subject in Turkey to evaluate internal biases, reliability and validity of Turkish Form of Modified Weight Bias Internalization Scale in Turkey has been examined.

Material and Method

Design

This methodological study was conducted in Erzurum Ataturk Unıversty Health Sciences Faculty. The study phases were; (1) translation of Modified Weight Bias Internalization Scale(MWBIS) in to Turkish language from English version and back translation into English,(2) content analysis by a panel of specialists, and (3) pretesting and psychometric Testing (factor analysis, a reliability coefficent, inter item correlations, correlation analysis).

The population of this study consisted of students from the Ataturk University Faculty of Health Sciences. The aim of this study was to reach the whole population in the study without using any sampling selection method. However, the sample group of this study consisted of the remaining 279 students in different weight categories apart from students who were not present at the university due to sick leave or absence, and those who did not want to participate in the questionnaire as the questionnaire was voluntary. Kalaycı (2010) suggested a sample size of 5–10 subjects per item to ensure a conceptually clear factor structure for factor analysis. The desired minimum sample size required was determined to be 55 participants based on 11 items. The data collection process was performed outside of the students' course hours without using any exclusion criteria. The scales were completed in approximately 10–15 minutes.

The Demographic Information Questionnaire was prepared by the researcher and it was a 4-question questionnaire formed to determine students' gender, age, height, and weight.

Modified Weight Bias Internalization Scale (MWBIS): The scale's original version was developed by Durso and Latner (2008) for the first time and it evaluates the "internal stigma" reflecting the internal experiences of obese individuals related to stigma. Later on, the scale was redeveloped by Pearl and Puhl (2014) in order to evaluate the individuals in different weight categories, the statement "because I am overweight" in 6 items of the original version of the scale was changed with the statement "because of my weight", and the scale was rearranged by preserving to the remaining 5 items in the original form. Including 11 items, the latest form of the scale is a 7-point likert type scale. The internal consistency coefficient of the scale's original English version was found to be 0.94.

The translation–back translation method was used in this study. The scale was translated from English to Turkish by three linguistic experts. The translated Turkish items were then examined by researchers and then the back translation was performed on items by another linguistic expert.

Content validity was assessed after completing the translation process. The scale was presented to an expert group of 7 academicians for their opinions. The experts examined the scale items in terms of clarity and cultural convenience. The Davis technique was used for content validity, which was reviewed based on the expert opinions (Yurdugul, 2005). After this evaluation, the total of the first two items was divided into the total number of experts and the content validity index (CVI) was obtained. When the CVI is greater than 0.80, this signifies that the item is sufficient in terms of content validity (Yurdugul, 2005). The CVI scores of all scale items were above 0.85; thus, no item was excluded from the scale regarding the content/scope validity. Following the content validity analysis, the scale was applied on a group of 10 students as pilot application (these 10 students were not included in the final study).The scale was finalized after this application.

Permission to the use the MWBIS in this study was obtained from the developers (Pearl and Puhl 2014). Before collecting the data of the study, an approval was received from Ataturk University Faculty of Health Sciences Ethics Committee. Before conducting the questionnaire, the students were informed about the study and their verbal consents were obtained. It was especially specified to the participants that their identity information would not be kept, results would be evaluated collectively and individualistic evaluation would not be conducted.

SPSS (version 16, SPSS Inc.,) was used to analyze the data. In order to conduct the statistical analysis, number, percentages, mean and standard deviations were used. On the other hand, analysis and techniques used for validity and reliability analyses are as follows; Test-Retest Reliability,Validity Analysis and Reliability Analysis.

Results

When descriptive characteristics of the students participating in the study were analyzed, it was found that 79.6% were female, the average age was 20.50±1.7 and body mass index varied between 13.98 and 32.39. According to the National Institutes of Health Weight Classification Guide, 10.8% of participants were slim (BMI < 18.5), 72.8% were normal (18.5≤ BMI <25), and 16.5% were overweight or obese(25≤ BMI < 30). According to their weight categories, the total WBIS score was found as underweight (2.34±1.11), normal weight (2.12±1.18), and overweight – obese (3.17±1.42).

Reliability Measures

Item analysis: item-total score correlation method was used in the study in order to determine the scale's internal consistency and conduct an item analysis. Internal consistency of the scale was assessed with Cronbach's alpha coefficient and item total score correlations. A Cronbach's alpha coefficient of at least 0.60 is required and item total score correlations of at least 0.20 in each item (Simsek, 2007). According to the results of the item analysis, MWBIS's item-total score correlation coefficients varied between 0.45 and 0.81. Item-total item correlation scores of the scale and the Cronbach α reliability coefficients to be obtained when items are omitted from the scale were also determined **(Table 1).**

The scale's internal consistency was calculated by using Cronbach alpha reliability analysis. MWBIS's Cronbach alpha value was determined as 0.92. The fact that the Cronbach Alpha coefficient is between 0.80 - 1.00 indicates that the scale has a high reliability.

Table 1. The scale's internal consistency and conduct an item analysis

Scale item	mean	sd	When the item is deleted, the Cronbach'a	Item total correlation
1. Because of my weight, I feel that I am just as competent as anyone.	2.36	1.96	0.91	0.67
2. I am less attractive than most other people because of my weight.	2.40	1.85	0.91	0.75
3. I feel anxious about my weight because of what people might think of me.	2.25	1.86	0.90	0.81
4. I wish I could drastically change my weight.	2.71	2.10	0.91	0.74
5. Whenever I think a lot about my weight, I feel depressed.	2.38	1.94	0.90	0.81
6. I hate myself for my weight.	1.83	1.67	0.91	0.76
7. My weight is a major way that I judge my value as a person.	3.41	2.23	0.92	0.45
8. I don't feel that I deserve to have a really fulfilling social life, because of my weight.	2.12	1.89	0.91	0.65
9. I am OK being the weight that I am.	3.64	2.31	0.92	0.53
10. Because of my weight, I don't feel like my true self	1.97	1.75	0.91	0.79
11. Because of my weight, I don't understand how anyone attractive would want to date me.	2.12	1.85	0.91	0.67

Another analysis conducted to determine the reliability of MWBIS was the test-retest application. This application reveals the inalterability of the measurement against time. High correlation coefficient between the two measurements indicates the inalterability of the measurement. Test-retest practice was performed in the sample group of 58 students for 2 weeks and the test-retest correlation coefficient was found to be 0.75 **(Table 2).**

Table 2. MWBIS Test-Retest correlation analysis of scores

	Mean ± sd	r	p
First application	2.32±1.22	0.75	0.000
Second application	2.40±1.82		

Validity Measurements

Construct validity*:* Sample size is a very important criterion in terms of the generalization and stability of factor analysis results and the observation rate per variable for reliable factor results is recommended to be between the rates of 1:10 or 1:20. This rate was found to be 279 people / 11 items =25.36 (approximately 25) in this study. This finding indicates a sample size which is approximately 25 times bigger than the number of items and this size is considered highly suitable in terms of the generalization of results.

After determining if sample size is sufficient in the factor analysis or not, it is tested whether or not the data are suitable for factor analysis. For this purpose, KMO (Kaiser-Meyer-Olkin) test is conducted for sampling adequacy and Barlett Test is performed to test if the data are suitable for the factor analysis or not. KMO's sample adequacy measure varies between 0 and 1. KMO value is required to be higher than 0.08 and close to 1 as much as possible for a good factor analysis. If KMO value is between 0.90 and 1.00, it is considered "very good"; if it is between 0.80 - 0.89, it is considered "good"; if it is between 0.70 - 0.79, it is considered "average"; if it is

between 0.60 - 0.69, it is considered "bad"; if it is between 0.50-0.59, it is considered "very bad"; and if it is below 0.50, it is considered "unacceptable" (Ozdamar, 2004). The significant p value obtained in the Barlett test conducted to determine the suitability of the sample size for factor analysis indicates that the data are suitable for factor analysis. According to the results of the study, the KMO coefficient of MWBIS was calculated as 0.92, and the result of the Bartlett Test was found to be at the significance level of p<0.001 **(Table 3).**

Table 3. MWBIS KMO and BTS analysis results

	results	p
Kaiser-Meyer-Olkin (KMO)	0.92	
Barlett's Test of Sphericity (BTS)	2155.366	p<0.001

Matrix of factor loads was analyzed in order to determine under which factors the items in MWBIS were collected. Factor load defines the weight of variables for that factor and takes a value between -1 and +1. Although the factor between 0.30 and 0.40 are generally considered as the lowest loads in the factor analysis, loads above 0.50 are defined as loads with application significance and loads above 0.70 are emphasized as loads that explain the construct well(Ozdamar, 2004). In this study, factor loads of all items in MWBIS were found to be between 0.60 and 0.80 **(Table 4).**

Table 4. MWBIS factor loads analysis

	Factor Load
1.item	0.61
2.item	0.71
3.item	0.80
4.item	0.72
5.item	0.80
6.item	0.69
7.item	0.78
8.item	0.61
9.item	0.60
10.item	0.71
11.item	0.60
Variance	%69.17

Discussion

Internalized weight bias involves the bias people have against themselves related to their weight, however the basis of these biases is shaped by the biases that the society has against the weight (Puhl&Heuer, 2010). In our study analyzing the Modified Internalized Weight Bias Scale Turkish Form's reliability and validity in Turkey; when total scale scores in different weight categories were examined; mean score of overweight and obese individuals was found to be higher than slim individuals and the mean score of slim individuals was found to be higher than individuals with normal weights. In line with these results, we can assert that not only obese individuals but also slim individuals stigmatize themselves because of their weights. In the study conducted by Pearl and Puhl (2014), it was reported that individuals who were not overweight according to the body mass index, had previous diet experiences and lost weight also had internalized weight bias and internalized weight bias was independent of BMI rate. Slim individuals were also found to be affected by internalized weight bias especially when accompanied by eating disorders (etc. overeating, anorexia).

Reliability

Reliability is the capacity of producing similar results in repeated measurements of the assessment tool and determining the real measurement value. Reliability is a basic quality that every assessment tool needs to possess and an essential quality. An assessment tool that has this quality shows that it is replicable and free from random mistakes. The most commonly used method to determine a scale's reliability especially among likert type scales is internal consistency (Kalaycı, 2010). Item analysis and Cronbach Alpha coefficient are used in order to determine internal consistency. At the end of the item analysis, it was found that MWBIS's item-total score correlation coefficients varied between 0.45 and 0.81, and Cronbach Alpha coefficient was 0.92. MWBIS's item-total item correlations were above 0.25. As no increase would take place in Cronbach α reliability coefficient if the item is omitted from the scale, no item was omitted from the scale. The fact that the Cronbach Alpha coefficient varied between 0.80 - 1.00 showed that the scale had a high level of reliability. Cronbach alpha coefficient was found to be 0.94 in the scale's original version.

Another analysis conducted to determine the reliability of MWBIS is the test-retest application. This application reveals the measurement's inalterability against time. This is also called as reliability coefficient, continuity or stability coefficient. A positive and significant correlation was observed at a medium level between two applications (r=0.75, p=.000).

Validity

Sufficient level of sample size is important for the reliability of the correlation between variables while conducting factor analysis. The size of our sample group was suitable for factor analysis (KMO=0.92). This result shows that the sampling group is sufficient for conducting a factor analysis and the significant result of the Bartlett test indicates that the data are suitable for factor analysis. Factor load defines the weight of variables for the factor in question and varies between -1 and +1. In this study, the factor loads of all items in MWBIS were found to be between 0.61 and 0.80. This reveals that the factor loads of the 11 items in MWBIS have application significance. Factor loads varied between 0.60 and 0.80 in the study in which the scale was developed. Factor loads varied between 0.50 and 0.89 in the study in which the scale was developed. According to the findings of the explaratory and confirmatory factor analyses, the Turkish form of the scale with 11 items was determined a unidimensiol in accordance with the original form.

Conclusion and recommendations:

In a general assessment, the data obtained from this study may be asserted to support the reliability and validity of MWBIS's Turkish Form. Findings obtained from the study reveal that the MWBIS's Turkish Form can be used in Turkey to evaluate the internal biases and stigma related to weight. Internalized weight bias affects individuals' mental state negatively. MWBIS can be considered as a tool that will allow the researchers and clinicians in Turkey to work in this subject.

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