Reliability, Validity and Factor Structure of Dysfunctional Attitudes Scale of Obesity (DASOB) and Automatic Thoughts Scale of Obesity (ATSOB)

Sultan Okumuşoğlu

Abstract- It is thought that obesity related cognitions should be measured directly by using specified scales. Therefore with the aim to be able to search obesity related cognitions directly, two scales were constructed which named as Dysfunctional Attitudes Scale of Obesity (DASOB) and Automatic Thoughts Scale of Obesity (ATSOB). Scales were constructed by using examples of thought or attitude expressions which are emphasized in related literature (Beck, 2007; O'Connor and Dowrick, 1987; Werrij et al., 2009) and which are consistent with author's clinical experiences. Four group of subjects as "successfull obeses", "unsuccesfull obeses", "obeses who does not look for professional help" and "normal controls" -32 subjects for each, and 128 for total- were used. The obeses who lost at least 10% of their initial weight and who were succesfully maintained 10% less weight for one year were assigned to the group "succesfull obeses" and the obeses who couldn't maintained weight loss were assigned to the group "unsuccesfull obeses". These two groups were choosen from patients of a private clinic and other two groups from general population. In terms of DASOB's validity analysis, statisticaly significant positive corelation was found between Dysfunctional Attitudes Scale of Obesity (DASOB) and Dysfunctional Attitudes Scale (DAS) (r=.538, p<.001); which reveals that high scores at DASOB are related with high scores at DAS and vice versa. Factor Analyses of DASOB pointed out that the total variance explained by four factors is 61,865%. Factor loadings of all items for the first factor were above 0,478 to 0,787 (except DASOB1 and DASOB12) and this result beside the high accelerated drop after first factor on graphic leads to the decision that this scale has one general factor. Also, one way variance analysis revealed that DASOB could differentiate "succesful obeses" from other obese groups. In terms of ATSOB's validity analysis, statisticaly significant positive corelation was found between Automatic Thoughts Scale of Obesity (ATSOB) and Automatic Thoughts Questionaire (ATQ) (r=.658, p<.001); which points out that high scores at ATSOB are related with high scores at ATQ and vice versa. According to Factor Analyses of ATSOB, the total variance explained by six factors is 67.180%. Factor loadings of all items for the first factor were above 0,312, and this result beside the accelerated drop after first factor on graphic leads to the decision that this scale has one general factor. Also, one way variance analysis revealed that ATSOB could differentiate "succesful obeses" from "obeses who does not look for professional help". According to reliability analysis; Cronbach alpha's for DASOB and ATSOB consequently was 0,883 and 0,829. In terms of split-half reliability, correlation between two halfs is 0,594 for DASOB and 0,582 for ATSOB. Analysis revealed that both DASOB and ATSOB can be accepted as valid and reliable instruments.

Keywords: Dysfunctional thoughts, Dysfunctional beliefs; Dysfunctional attitudes; Cognitions; Weight-loss success; Obesity; Automatic Thoughts

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Dr.Sultan Okumuşoğlu, PhD. in Clinical Pschology is currently lecturer and Head of Psyhology Department at Girne American University.

I. INTRODUCTION

Obesity accepted as an epidemic (Abelson and Kennedy, 2004) and as a global public health problem which keeps growing (World Health Organisation; WHO, 1997). At the same time medical care costs which are related with the health problems hosted by obesity keeps growing (Cawley, and Meyerhoefer, 2012). Weight loss and maintenance of new weight have been informed as possible but not common (Ikeda et al., 2005; Wing, and Phelan, 2005). Even if some weight loss succeded, it is a well known fact that generally new weight couldn't be maintained (Jeffrey et al., 2000; Mann et al., 2007). According to Aaron Beck (1967) a person's affective response to an experience is predicted by how that person is structuring this experience. According to Judith Beck (2007), weight loss success is highly related with dysfunctional beliefs; for example "all or none" type dychotomic thinking style is very important in terms of outcomes of weight loss programs. On the other hand automatic thoughts are accepted as a stream of thoughts which are experienced commonly and which effects individual's mood and behaviors (Beck, 1967). When people has attitudes as "since I ate something I shouldn't suppose to eat, I should better leave my diet for the rest of the day" or when people has thoughts as " I can eat this because ……." weight loss strategies couldn't be helpfull for these people since they couldn't adhere themselves to application and continuation of the necessary strategies (Beck, 2007). The dysfunctional thoughts and irrational beliefs such as "since I ate something I shouldn't suppose to eat, my whole diet is ruined" which were clearly mentioned in Judith Beck's (2007) book "Beck Diet Solution" were also emphasized by others in the literature (O'Connor and Dowrick, 1987; Werrij et al., 2009). The need for more research about overeating, obesity and obesity related beliefs have also been emphasized in the related literature (Coelho, Siggen, Dietre, and Bouvard, 2013). It has been pointed out that despite the importance of the psychological factors which leads to weight loss succes or failure, these factors are not investigated as much as they should be (Byrne, 2002). It is obvious that obesity related, diet related dysfunctional thoughts, beliefs and attitudes have not been studied as much as they should be, despite the fact that this information could be usefull for development of more effective Cognitive Behavioral Treatment protocols and for also improvement of primary prevention efforts for obesity pandemic. Therefore, in the light of the related literature the aim of this study is investigation of reliability, validity and factor structure of Dysfunctional Attitudes Scale of Obesity

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(DASOB) and Automatic Thoughts Scale of Obesity (ATSOB) which were constructed by the investigator -by using examples of thought or attitude expressions which were supported by clinical experience and which were emphasized in literature (Beck, 2007; O'Connor and Dowrick, 1987; Werrij et al., 2009)- with the aim to be able to search obesity related cognitions directly.

II. METHODS

There are 128 volunteer participants in the study; four groups and 32 participants in each group. There are three obese groups (Body Mass Index; BMI≥30) and one "normal controls" group (18,5≤ BMI ≥24,9). The obeses who lost at least 10% of their begining weight and who were succesfully maintained it for one year were assigned to the group "succesfull obeses". The obeses who couldn't maintained weight loss or couldn't loose weight was assigned to the group "unsuccesfull obeses". "Succesfull obeses" and "unsuccesfull obeses" were taken from volunteered patients of a private practicing nutrition and diet clinic. Patients who are coming to the clinic at least for 2 years in weekly basis were selected from this center and they asked either they want to be volunteer or not. "The obeses who doesn't look for professional help" for weight loss have been found from general population according to availability principle. The "normal controls" (18,5 ≤ BMI ≥ 24,9) have also been found from general population according to avaliability principle. All subjects were participated voluntarily; 99 of them are female and 29 of them are male and 62 of them are married and 66 of them are not married. In terms of educational level of participants; there are 15 primary, 37 high school, 56 graduate and 20 postgraduate degrees. The age range is between 18 and 58 (M=33,71 and SD=10,18).

III. INSTRUMENTS

Dysfunctional Attitudes Scale of Obesity (DASOB)

DASOB is constructed as an 18 item self report inventory, which rated on a seven point (1-7) likert scale. The scale was constructed by using the dysfunctional attitude examples from literature, especially from Judith Beck's "Beck Diet Solutions" book (Beck, 2010, p.222). (DASOB include items such as "I should diet absolutely or I should not diet."; "Since I am too stressfull right now, I have right to eat this food." etc.)

Automatic Thoughts Scale of Obesity (ATSOB)

ATSOB is constructed as a 17 item self report inventory which rated on a five point (1-5) likert scale. The scale was constructed by using Judith Beck's examples (Beck, 2010, p.188) about the self deceiving, saboteur thougths related with dieting. (ATSOB include items such as "I can eat this because, everyone is eating."; "I can eat this because, it is not a whole piece." etc.).

Dysfunctional Attitudes Scale (DAS)

The DAS is a 40 item self report inventory, which rated on a seven point likert scale, assesing depressive dysfunctional thoughts, assumptions and beliefs (Weisman, and Beck, 1978). Turkish reliability and validity of DAS was conducted by Şahin and Şahin (1992a).

Automatic Thoughts Questionaire (ATQ)

The ATQ is a 30 item self report inventory, which rated on a five point likert scale, assesing negative thoughts and negative self evaluations which frequently associates with depression (Hollon, and Kendall, 1980). Turkish reliability and validity of the ATQ was conducted by Şahin and Şahin (1992b).

IV. PROCEDURE

The study protocol followed the ethical guidelines of Turkish Psychological Association. Every participant was volunteer, and informed consent was obtained from each participant. Self report inventories were given in random order to prevention of any possible sequence effect.

V. RESULTS

Validity analyses for DASOB and ATSOB

When DASOB and ATSOB was formed, they both checked in terms of suitability to the what was intended to be measured. Beside the fact that used items was reflecting Judith Beck's (2007; 2010) expert opinions with obese and overweight patients, learned opinion has also been taken from three other experts; one Dr. Clinical Psychologist and two Dr. Dietitician, Those experts were asked to rate each item of each scale on an 11 point likert scale which ranges form 0% to 100%. The range of expert's ratings about the suitability for each item of the scales to what was intended to be measured was between 90% and 100%. Therefore no item has been excluded from DASOB and ATSOB.

Validity analyses of DASOB

For validity analyses of DASOB, two things have been done. First, corelation of DASOB and DAS have been checked; Positive and statisticaly significant corelation was found between DASOB and DAS ($r=.538$, $p<.001$). The result indicates that high scores at DASOB are related with high scores at DAS and vice versa. Second, Factor analyses for DASOB have been performed. According to factor analyses of DASOB, the total variance explained by four factors is 61,865%. Communalities ranges between 0,444 and 0,733. According to component matrix, except DASOB 1 (-.076) and DASOB 12 (.326) factor loadings for all items for the first factor were above 0,478 to 0,787. Those findings and high accelerated drop after first factor on graphic (in figure 1) leads to the decision that this scale has one general factor. (Relevant figures and tables of factor analysis are shown in figure 1 and table 1, table 2, and table 3).

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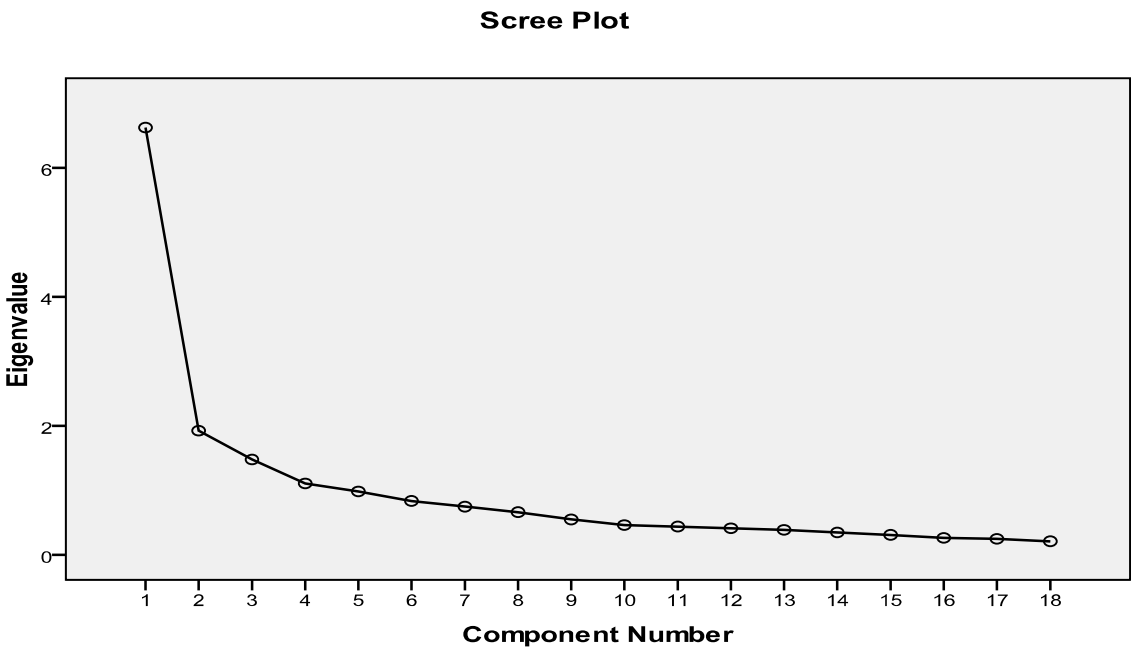

Figüre 1. Scree plot for factor analysis of DASOB

Table 1. Total variance explained for DASOB

Total Variance Explained									
	Component Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6,624	36,803	36,803	6,624	36,803	36,803	3,250	18,057	18,057
2	1,925	10,693	47,496	1,925	10,693	47,496	2,676	14,869	32,926
3	1,478	8,213	55,708	1,478	8,213	55,708	2,616	14,534	47,460
4	1,108	6,157	61,865	1,108	6,157	61,865	2,593	14,405	61,865
5	,984	5,466	67,332						
6	,836	4,644	71,975						
7	,748	4,157	76,132						
8	,662	3,678	79,810						
9	,549	3,050	82,860						
10	,463	2,570	85,430						
11	,439	2,437	87,867						
12	,413	2,296	90,163						
13	,389	2,161	92,324						
14	,348	1,935	94,260						
15	,311	1,725	95,985						
16	,264	1,465	97,450						
17	,248	1,380	98,829						
18	,211	1,171	100,000						

Extraction Method: Principal Component Analysis.

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Table 2. Component matrix[a] for DASOB

	Component			
	1	**2**	**3**	**4**
DASOB 6	,787	,059	,097	-,060
DASOB 5	,752	,036	,164	,096
DASOB 8	,700	,267	-,120	-,112
DASOB 17	,678	-,386	,019	,044
DASOB 11	,675	-,187	,389	-,105
DASOB 18	,660	-,210	-,085	,496
DASOB 10	,657	,168	,286	,129
DASOB 4	,638	,403	,250	,243
DASOB 15	,630	-,295	-,422	,205
DASOB 14	,630	-,392	-,132	-,047
DASOB 9	,612	,378	-,135	-,219
DASOB 2	,603	,413	,054	,111
DASOB 13	,575	-,319	-,015	-,110
DASOB 3	,509	,462	-,342	-,236
DASOB 1	-,076	,658	,023	,350
DASOB 12	,326	-,290	,654	-,038
DASOB 16	,478	-,197	-,599	,154
DASOB 7	,545	,069	-,050	-,654

Extraction Method: Principal Component Analysis. a. 4 components extracted.

Table 3. Communalities for DASOB

	Communalities	
	Initial	Extraction
DASOB1	1,000	,561
DASOB 2	1,000	,549
DASOB 3	1,000	,646
DASOB 4	1,000	,691
DASOB 5	1,000	,603
DASOB 6	1,000	,635
DASOB 7	1,000	,732
DASOB 8	1,000	,588
DASOB 9	1,000	,584
DASOB 10	1,000	,559
DASOB 11	1,000	,653
DASOB 12	1,000	,620
DASOB 13	1,000	,444
DASOB 14	1,000	,571
DASOB 15	1,000	,705
DASOB 16	1,000	,650
DASOB 17	1,000	,610
DASOB 18	1,000	,733

Extraction Method: Principal Component Analysis.

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VI. VALIDITY ANALYSES OF ATSOB

For validity analyses of ATSOB, two things have been done. First, corelation of ATSOB and ATQ have been checked; positive and statistically significant corelation was found between ATSOB and ATQ (r=.658, p<.001). According to this, high scores at ATSOB are related with high scores at ATQ and vice versa. Second, factor analyses for ATSOB have been performed. According to Factor Analyses of ATSOB, the total variance explained by six factors is 67.180%. Communalities ranges between 0,516 and 0,758. According to component matrix, factor loadings of all items for the first factor were above 0,312. Those findings and high accelerated drop after first factor on graphic (figure 2) leads to the decision that this scale has one general factor. (Relevant figures and tables of factor analysis are shown in figure 2 and table 4, table 5, and table 6).

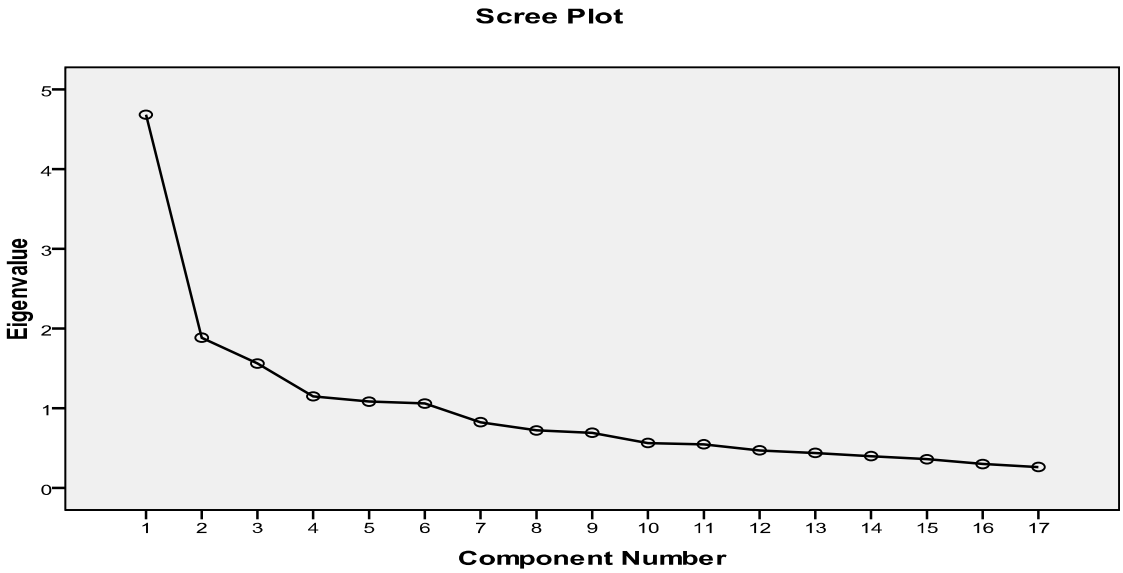

Figure 2. Scree plot for factor analysis of ATSOB

Table 4. Total variance explained for ATSOB

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,683	27,548	27,548	4,683	27,548	27,548	2,341	13,771	13,771
2	1,885	11,089	38,637	1,885	11,089	38,637	2,271	13,358	27,128
3	1,561	9,182	47,819	1,561	9,182	47,819	2,031	11,948	39,077
4	1,149	6,758	54,577	1,149	6,758	54,577	1,674	9,847	48,923
5	1,083	6,370	60,947	1,083	6,370	60,947	1,586	9,331	58,255
6	1,060	6,233	67,180	1,060	6,233	67,180	1,517	8,925	67,180
7	,824	4,847	72,027						
8	,721	4,243	76,270						
9	,691	4,067	80,337						
10	,564	3,318	83,655						
11	,547	3,216	86,871						
12	,471	2,772	89,643						
13	,439	2,582	92,225						
14	,398	2,342	94,567						
15	,360	2,117	96,684						
16	,301	1,770	98,455						
17	,263	1,545	100,000						

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Table 5. Component matrix for ATSOB

	Component					
	1	**2**	**3**	**4**	**5**	**6**
ATSOB11	,711	-,125	-,112	-,197	-,180	-,332
ATSOB12	,663	-,198	-,273	-,160	-,147	-,397
ATSOB 7	,627	-,101	-,307	,349	,185	,224
ATSOB 6	,605	,002	-,181	,353	-,137	,259
ATSOB 3	,601	-,162	,414	,049	,135	-,342
ATSOB 13	,576	-,248	-,411	,245	-,339	-,080
ATSOB 9	,566	-,332	-,109	-,489	-,129	,198
ATSOB 5	,552	,208	,134	,326	,429	-,281
ATSOB 8	,514	-,264	-,301	-,069	,431	,308
ATSOB 17	,480	,414	-,099	-,324	,075	,038
ATSOB10	,471	,232	,161	-,445	,298	,264
ATSOB15	,455	,635	,068	,014	-,090	,202
ATSOB 16	,478	,527	,082	-,070	-,047	-,191
ATSOB 1	,312	-,522	,512	,113	,334	-,032
ATSOB14	,387	,447	,151	,319	-,154	,136
ATSOB 4	,375	-,011	,613	-,026	-,355	,025
ATSOB 2	,347	-,362	,422	,053	-,299	,412

Extraction Method: Principal Component Analysis. a. 6 components extracted

Table 6. Communalities for ATSOB

	Initial	Extraction
ATSOB 1	1,000	,758
ATSOB 2	1,000	,691
ATSOB 3	1,000	,697
ATSOB4	1,000	,644
ATSOB 5	1,000	,735
ATSOB 6	1,000	,609
ATSOB 7	1,000	,704
ATSOB 8	1,000	,710
ATSOB 9	1,000	,737
ATSOB 10	1,000	,658
ATSOB 11	1,000	,715
ATSOB 12	1,000	,758
ATSOB 13	1,000	,743
ATSOB 14	1,000	,516
ATSOB 15	1,000	,664
ATSOB 16	1,000	,557
ATSOB 17	1,000	,524

Extraction Method: Principal Component Analysis.

VII. RELIABILITY ANALYSES FOR DASOB AND ATSOB

DASOB reliability analyses

Cronbach alpha for DASOB is 0,883. The range of Cronbach alpha if item deleted is between 0,870 and 0,898. In terms of split-half reliability, correlation between two halfs is 0,594.

ATSOB reliability analyses

Cronbach alpha for ATSOB is 0,829. The range of Cronbach alpha if item deleted is between 0,808 and 0,830. In terms of split-half reliability, correlation between two halfs is 0,582.

VIII. CONCLUSIONS

Reliability and validity analysis revealed that both DASOB and ATSOB can be accepted as valid and reliable instruments. In terms of DASOB's validity analysis, statisticaly significant positive corelation was found between DASOB and DAS (r=.538, p<.001); which reveals that high scores at DASOB are related with high scores at DAS and vice versa. At first look, factor analyses of DASOB pointed out that the total variance explained by four factors is 61,865%. Since factor loadings of all items for the

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first factor were above 0,478 to 0,787 (except DASOB1 and DASOB12) and since there was a high accelerated drop after first factor on graphic, findings leads to the decision that this scale has one general factor. Also, one way variance analysis revealed that DASOB could differentiate "succesful obeses" from other obese groups. In terms of ATSOB's validity analysis, statisticaly significant positive corelation was found between ATSOB and ATQ (r=.658, p<.001); which points out that high scores at ATSOB are related with high scores at ATQ and vice versa. According to Factor Analyses of ATSOB, the total variance explained by six factors is 67.180%. Factor loadings of all items for the first factor were above 0,312, and results revealed an accelerated drop after first factor on graphic; these results leads to the decision that this scale has one general factor. Also, one way variance analysis revealed that ATSOB could differentiate "succesful obeses" from "obeses who does not look for professional help". According to reliability analysis; Cronbach alpha's for DASOB and ATSOB consequently was 0,883 and 0,829. In terms of split-half reliability, correlation between two halfs is 0,594 for DASOB and 0,582 for ATSOB. These findings are consistent with the preliminary study of this study's author which can be accepted as pilot study of this research. According to mentioned previous study's findings Cronbach alpha's for DASOB and ATSOB consequently was 0.889 and 0,867 and one way variance analysis revealed that DASOB and ATSOB both could differentiate "succesful obeses" from the "obeses who does not look for professional help". Mentioned previous study's results also revealed that ATSOB could differentiate "obeses who does not look for professional help" from the "normal controls" and DASOB could differentiate the "succesfull obeses" from the "unsuccesfull obeses" (Okumuşoğlu; 2014). Results of the present study indicated that DASOB could differentiate "succesfull obeses" from "unsuccessfull obeses" and "obeses who does not look for help" and DASOB and ATSOB both could differentiate "successfull obeses" from "obeses who does not look for professional help". Therefore, it can be said that DASOB will be usefull to predict the patients who might need extra cognitive behavioral interventions beside diet interventions in order to be succesfull at weight management, beside the suggestions derived from both of the scales can give usefull ideas to help to the obeses in general society and for primary prevention studies. Finally, it is hoped that the results of the present study will contribute to the factors which guide preparation of effective cognitive behavioral interventions to help people who are fighting with obesity problem and Dysfunctional Attitudes Scale of Obesity (DASOB) and Automatic Thoughts Scale of Obesity (ATSOB) will be usefull in practice and research areas both.

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Dr. Sultan Okumuşoğlu (PhD. in Clinical Pschology) is currently lecturer and Head of Psyhology Department at Girne American University.

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