

Original Article

# Reliability of an Arabic Version of the Short Form Modified Yale Food Addiction Scale

Eman I. Mobarak <sup>✉</sup>, Dalia K. Eldeeb, Heba M. El-Weshahi

Community Medicine Department, Faculty of Medicine, Alexandria University, Egypt

## Abstract

**Background:** Food addiction (FA) is a growing problem worldwide, associated with physical and psychological dysfunction. The original Yale Food Addiction Scale (YFAS) was developed in 2009 for diagnosis of FA. Updated long and short forms of the Scale were developed in 2016 and 2017 respectively. An Arabic version of the updated short form suiting epidemiological purposes is lacking.

**Objective(s):** The study aimed to adapt and test reliability of an Arabic version of the short form modified Yale Food Addiction Scale (mYFAS 2.0) for epidemiological purposes in Arab countries.

**Methods:** This cross-sectional study was conducted in Alexandria, Egypt from June 1st to September 15th 2019. The short form mYFAS 2.0 was translated into Arabic language following the WHO translation guidelines. A self-report questionnaire including both English and Arabic versions was completed by 296 Arab adults fluent in Arabic and English, interviewed at public places. Weight and height were self-reported and Body Mass Index was calculated.

**Results:** Kuder–Richardson alpha was 0.89 and 0.92 and Cronbach's Alpha was 0.93 and 0.94 for symptoms and the whole scale respectively. Cronbach's alpha decreased if any item was deleted. Corrected item-total correlation coefficients ranged between 0.5-0.7. These values indicate good internal consistency. Kappa coefficients ranged between 0.85-0.99 (P<0.001) indicating almost perfect agreement between Arabic and English versions of mYFAS 2.0. Food addiction rate was 17.6%.

**Conclusion:** The present study adapted a reliable Arabic version of mYFAS 2.0 that can be a substitute to the English version in epidemiological work. The study recommends further multi-disciplinary population studies to assess the problem, determine correlates and suggest appropriate interventions.

**Keywords:** Arabic; mYFAS 2.0; food addiction; reliability

Available on line at:

[jhiphalexu.journals.ekb.eg](http://jhiphalexu.journals.ekb.eg)

Print ISSN: 2357-0601

Online ISSN: 2357-061X

CC BY-SA 4.0

✉Correspondence:

Email: [emanmobarak10@yahoo.com](mailto:emanmobarak10@yahoo.com)

**Suggested Citations:** Mobarak EI, Eldeeb DK, El-Weshahi HM. Reliability of an Arabic Version of the Short Form Modified Yale Food Addiction Scale. JHIPH. 2019;49(3): 168-174.

## INTRODUCTION

Food addiction (FA) or addictive-like eating is a growing problem worldwide, associated with physical and psychological dysfunction. It was strongly associated with higher body mass index (BMI) and obesity; known to be associated with serious health consequences. Psychological correlates of FA included depression, anxiety, skin picking disorder, impulsiveness, difficulties in emotion regulation and suicidal ideation. Reduced physical, psychological and environment quality of life was also documented.<sup>(1-7)</sup> Since it is important to identify this problem, Gearhardt et al.,<sup>(8)</sup> have developed the 25-item Yale Food Addiction Scale (YFAS) in 2009. The structure of this instrument was based on the seven diagnostic criteria for substance dependence in the Diagnostic and Statistical Manual of Mental Disorders-4 (DSM-4). In the next version (DSM-5, 2013), these criteria were greatly changed, where both symptoms of substance

dependence (7) and abuse (4) were unified (11 symptoms) and named symptoms of substance use disorder (SUD). Also, one of the dependence symptoms (concerned with legal troubles) was replaced by a new criterion 'craving'.<sup>(9)</sup> Accordingly, another version of the YFAS was developed (YFAS 2.0, 2016) to cope with these modifications and showed psychometric properties, FA rates, and correlates similar to the original scale. This version (35 items) involved great modifications in the scale and scoring system. With multiple questions enquiring each symptom, YFAS 2.0 constitutes an excellent diagnostic tool for of FA. (1,10) However, it is not feasible in rapid screening and large epidemiological studies. A briefer (13-items; one for each symptom) modified version of YFAS 2.0 (mYFAS 2.0, 2017) was developed which suits these purposes and performed equal to YFAS 2.0.<sup>(3)</sup> Both YFAS and YFAS 2.0 performed well in numerous studies and have been translated into several languages.<sup>(1,2)</sup> Regarding Arabic translations, an Arabic version of the

earlier YFAS was developed and used as a tool in a thesis at Ain-Shams University (Egypt, 2014).<sup>(11)</sup> Another validated Arabic version of YFAS 2.0 (YFAS 2.0-A) was developed by Fawzi et al suited for clinical diagnosis (Egypt, 2017).<sup>(12)</sup> An Arabic version of the short form mYFAS 2.0 that suits epidemiological purposes in Arab culture is lacking.

The present work aims at adapting and testing reliability of a translated Arabic version of the short form of modified Yale Food Addiction Scale for epidemiological purposes in Arab countries.

## METHODS

**Design:** A cross-sectional study was conducted in Alexandria, Egypt from June 1<sup>st</sup> to September 15<sup>th</sup>, 2019.

**Target population:** Target population was Arab adults ( $\geq 18$  years) available in Alexandria during the period of study.

**Inclusion criteria:** Persons whose mother language was Arabic and were fluent in English were included in the study regardless of nationality or gender. **Exclusion criteria:** Pregnant women, participants <18 years, and anybody who failed to respond to at least one of the scale items (either in Arabic or English) were excluded.

### Procedure

**Scale description and scoring:** The English version of mYFAS 2.0 (mYFAS 2.0-EN) composed of 13 self-report items. Eleven items represent the 11 criteria for SUD in the DSM-5 and two measure the clinical significance (distress/impairment) of these symptoms. Responses to the 13-items were scored on a Likert scale from 0-7 ranging between "Never" and "Daily". Each question had a different cut-off value to define met criterion. Met criterion was given score (1) and unmet score (0). Additional two sum-scores were calculated, where adding the sub-scores of symptom criterion (11-items) yielded symptom count score (0-11). Similarly, adding the sub-scores of clinical significance (2-items) gave clinical significance score (0-2). If clinical significance score = 1-2, then clinical significance criterion was met (keystone of diagnosis) and scored (1), otherwise was unmet and given (0) score. Diagnostic threshold of FA was fulfilled by reporting 2 or more symptoms (symptom count score = 2-11) plus meeting clinical significance criterion. FA was further categorized according to number of symptoms associating clinical significance criterion into; mild (symptom count score = 2-3), moderate (symptom count score = 4-5) and severe (symptom count score 6-11).<sup>(1,3)</sup>

**Translation process:** The short-form mYFAS 2.0-EN was translated into Arabic language following the WHO translation guidelines (forward backward translation) followed by a pre-testing phase.<sup>(13)</sup>

**Forward Translation:** The scale was translated into Arabic by one of the investigators (with previous experience in scale translation) and revised by two independent bilingual professional translators and a

professor of psychiatry with Arabic as mother tongue language. After completing their tasks, a meeting with the investigators was held and the recommended suggestions were performed.

**Backward Translation:** The approved Arabic version of mYFAS 2.0 was then back translated into English by another bilingual professional body with English as mother tongue language. Agreement between the original English and the back-translated forms was ensured by the investigators and the professional team.

**Pre-testing:** For pre-testing and culturally adapting the Arabic scale, 30 volunteers of different Arab nationalities (Egyptians, Gulf citizens and Syrians) and gender were interviewed at public places. The biggest three shopping malls in Alexandria were chosen for sample collection. Participants were asked to respond to the pre-final Arabic translation (mYFAS 2.0-AR). After completion, they were asked to express the concept of each item in their own words to ensure complete understanding. Afterwards they were asked about any suggestions for modification. According to the feedback of pre-testing, little changes were conducted and the final mYFAS 2.0-AR (annex 1) was revised again by the professional team who approved that version.

**Catch questions :** Similar to the original mYFAS 2.0-EN,<sup>(3)</sup> three catch (trick) questions were added at the end of both the Arabic and English versions of the scale to test attention of the participants. They asked about impossible situations so that responses other than 'never' would be incorrect.

### Application of the scale

**Study Setting and sampling:** A convenient non-probability sample of 300 respondents fluent in Arabic and English was selected from those attending three shopping malls in Alexandria during the period of study

**Data Collection:** Data was collected by a pre-designed anonymous self-report questionnaire including few demographic data (age, sex, nationality and occupation), the mYFAS 2.0-EN and the culturally-adapted mYFAS 2.0-AR.<sup>(12)</sup> After completing the English version, an open distracting discussion was allowed for 15-20 minutes then the participant was let to complete the Arabic version. Self-reported weight and height were collected and body mass index (BMI) was calculated according to WHO guidelines. Participants were classified into underweight (< 18.5 kg/m<sup>2</sup>), normal weight (18.5–24.9 kg/m<sup>2</sup>), Pre-obese (25.0–29.9 kg/m<sup>2</sup>) and obese ( $\geq 30$  kg/m<sup>2</sup>).<sup>(4)</sup> Investigators were available during questionnaire filling for any queries.

### Statistical analysis

Data was analyzed using the IBM SPSS (Version 21). Only data of 296 adult participants were included (four adolescents <18 years were excluded). All collected data was complete, all of the three 'catch' questions were correctly answered, and no other data was excluded. Descriptive statistics, Pearson correlation, Shapiro-Wilk Test of normal distribution and Mann-Whitney U-test were applied. Kuder–Richardson alpha 20 (KR-20, for

dichotomous scores) and Cronbach's alpha (for continuous scores) were conducted to examine internal consistency reliability of the mYFAS 2.0-AR scale with satisfactory coefficient value  $>0.7$ . Corrected item-total correlation with coefficient value  $>0.4$  and decrease of Cronbach's alpha if item deleted were also utilized as indicators of acceptable internal consistency reliability. Agreement between the mYFAS 2.0-EN and mYFAS 2.0-AR was assessed using kappa statistics. According to value of Kappa coefficient (K), strength of agreement was considered poor ( $k < 0.00$ ), slight ( $k = 0.00-0.20$ ), fair ( $k = 0.21-0.40$ ), moderate ( $k = 0.41-0.60$ ), substantial ( $k = 0.61-0.80$ ), almost perfect ( $k > 0.80$ ).<sup>(15)</sup> Results were judged at 0.05 level of significance.

#### Ethical consideration

The study proposal was reviewed and approved by the Research Ethics Committee of Alexandria Faculty of Medicine. Permission for Arabic translation was obtained from the mYFAS 2.0 authors. Participants were informed about aims and benefits of the study and a verbal consent was obtained. Collected data was kept confidential.

## RESULTS

### I- Characteristics of the participants

The present study involved 296 participants with a mean age of  $29.4 \pm 9.6$  (18-65) years. Participants were mostly

females (54.4%) and Egyptians (72.6%). Participants from Gulf region, Syria, Palestine, Jordan, Sudan and Tunisia constituted 27.4%. Students composed 37.2%, employees 60.1% and retired employees 2.7%. The mean self-report BMI was  $27.5 \pm 6.0$  (16.2-49.2) kg/m<sup>2</sup>. Almost 33.9% of adult participants were of normal weight, while pre-obesity and obesity prevailed among 34.7% and 26.3% respectively. Under-weight was encountered among 5.2%. (Data not shown)

### II- Arabic versus English version of mYFAS

**Achieved scores:** The mean scores of the individual scale items (dichotomous) and that of the symptom count and clinical significance are presented in table (1). It reveals that the mean scores of symptom count and clinical significance on the Arabic mYFAS-AR [ $1.84 \pm 2.83$  (0-11) and  $0.27 \pm 0.62$  (0-2) respectively] were almost equal to that of the mYFAS-EN [ $1.83 \pm 2.77$  (0-11) and  $0.26 \pm 0.61$  (0-2) respectively]. Similar findings were observed among mean scores of clinical significance criterion (0-1) ( $0.17 \pm 0.38$  for mYFAS-AR and  $0.18 \pm 0.38$  for mYFAS-EN)

**Diagnostic threshold:** On the mYFAS-AR, 17.6% of the participants achieved threshold of FA diagnosis versus 16.9% on the mYFAS-EN (Table1). Among FA, 5.4% fulfilled mild degree on the mYFAS-AR versus 4.7% on the mYFAS-EN, moderate; 3.8% versus 4.1% and severe; 8.4% versus 8.1%.

**Table 1: English versus Arabic version of the modified Yale Food Addiction Scale 2.0 (mFAYS 2.0)**

Variable	mFAYS 2.0-EN (n=296)	mFAYS 2.0-AR (n=296)
<b>I- Scale scores: (mean <math>\pm</math> SD)</b>		
Substance taken in larger amount and for longer period than intended (item 1)	0.32 $\pm$ 0.47	0.29 $\pm$ 0.45
Much time/activity to obtain, use or recover (item 2)	0.15 $\pm$ 0.35	0.16 $\pm$ 0.36
Important social, occupational or recreational activities given up or reduced (item 3)	0.24 $\pm$ 0.43	0.24 $\pm$ 0.43
Withdrawal symptoms; substance taken to relieve withdrawal (item 4)	0.14 $\pm$ 0.35	0.15 $\pm$ 0.36
Failure to fulfill major role obligations (item 7)	0.16 $\pm$ 0.37	0.16 $\pm$ 0.37
Use continues despite knowledge of adverse consequences (item 8)	0.17 $\pm$ 0.37	0.16 $\pm$ 0.37
Tolerance (item 9)	0.06 $\pm$ 0.25	0.08 $\pm$ 0.28
Craving, or a strong desire or urge to use (item 10)	0.17 $\pm$ 0.37	0.17 $\pm$ 0.38
Persistent desire or repeated unsuccessful attempts to quit (item 11)	0.15 $\pm$ 0.36	0.15 $\pm$ 0.36
Use in physically hazardous situations (item 12)	0.14 $\pm$ 0.35	0.14 $\pm$ 0.35
Continued use despite social or interpersonal problems (item 13)	0.13 $\pm$ 0.34	0.14 $\pm$ 0.35
Use causes clinically significant distress (item 5)	0.16 $\pm$ 0.36	0.16 $\pm$ 0.37
Use causes clinically significant impairment (item 6)	0.11 $\pm$ 0.31	0.11 $\pm$ 0.32
Symptom count score (11-item)	1.83 $\pm$ 2.77	1.84 $\pm$ 2.83
Clinical significance scores (2-item)	0.26 $\pm$ 0.61	0.27 $\pm$ 0.62
Clinical significance criterion score	0.17 $\pm$ 0.38	0.18 $\pm$ 0.38
<b>II- Diagnostic rate: No. (%)</b>		
Frequency of Food Addiction	50 (16.9%)	52 (17.6%)
Mild	14 (4.7%)	16 (5.4%)
Moderate	12 (4.1%)	11 (3.8%)
Severe	24 (8.1%)	25 (8.4%)
mFAYS 2.0-EN; English version of the modified Yale Food Addiction Scale 2.0		
mFAYS 2.0-AR; Arabic version of the modified Yale Food Addiction Scale 2.0		

### Criterion Agreement

Table 2 displays agreement between different items of the mYFAS-AR and mYFAS-EN. It shows that the most

frequent substance-use disorders criteria were loss of control over the eating behaviour and reduced social activities (32.1%, 23.6% among Arabic and 29.1%, 24.0%

among English versions respectively). Kappa statistics revealed almost perfect agreement ( $k= 0.85-0.99$ ,  $p<$

$0.001$ ) between various scale items of the mYFAS-AR and the mYFAS-EN.

**Table 2: Agreement between English and Arabic versions of modified Yale Food Addiction Scale 2.0**

Scale Item	mFAYS 2.0-EN (n=296)	mFAYS 2.0-AR (n=296)	K
	n (%)#	n (%)#	
- Substance taken in larger amount and for longer period than intended (item 1)	86 (29.1 %)	95 (32.1%)	0.93*
- Much time/activity to obtain, use or recover (item 2)	43 (14.5 %)	46 (15.5 %)	0.91*
- Important social, occupational or recreational activities given up or reduced (item 3)	71(24.0 %)	70 (23.6%)	0.99*
- Withdrawal symptoms; substance taken to relieve withdrawal (item 4)	42 (14.2%)	45(15.2%)	0.85*
- Failure to fulfill major role obligations (item 7)	48 (16.2%)	47 (15.9 %)	0.99*
- Use continues despite knowledge of adverse consequences (item 8)	49 (16.6%)	48 (16.2%)	0.99*
- Tolerance (item 9)	19 (6.4%)	22 (7.4%)	0.85*
- Craving, or a strong desire or urge to use (item 10)	50 (16.9 %)	51 (17.2 %)	0.94*
- Persistent desire or repeated unsuccessful attempts to quit (item 11)	45 (15.2%)	45 (15.2%)	0.97*
- Use in physically hazardous situations (item 12)	42 (14.2 %)	41 (13.9%)	0.99*
- Continued use despite social or interpersonal problems (item 13)	39 (13.2%)	41 (13.9%)	0.97*
- Use causes clinically significant distress (item 5)	46 (15.5 %)	47 (15.9%)	0.99*
- Use causes clinically significant impairment (item 6)	32 (10.8%)	33 (11.1 %)	0.98*
Clinical significance criterion	50 (16.9%)	52 (17.6%)	0.98*

# Percentage of those having the criterion \*  $p<0.001$

**III. Internal Consistency of mYFAS- AR**

Table 3 shows that, using the binary scores, Kuder–Richardson alpha was 0.89 (for symptoms) and 0.92 (for the whole scale). Similarly, Cronbach's Alpha was 0.93 (for symptoms) and 0.94 (for the whole scale), using continuous scores. Also, alpha value decreased than the overall alpha if item deleted. Corrected

item-total correlation coefficients ranged between 0.5-0.7.

**IV- Association between BMI and mYFAS-AR**

BMI was positively correlated with symptom count ( $r= 0.46$ ,  $p<0.001$ ). Also, individuals with FA had significantly higher mean rank of BMI (227.1) compared to those without (131.8), (Mann-Whitney  $U=2258.5$ ,  $Z =-7.3$ , 2-tailed  $p<0.001$ ). (Data not shown)

**Table 3: Internal consistency of the Arabic version of the modified Yale Food Addiction Scale 2.0**

Scale Item*	Corrected ItemTotal Correlation	Cronbach's Alpha if Item Deleted
- Substance taken in larger amount and for longer period than intended (item 1)	0.636	0.883
- Much time/activity to obtain, use or recover (item 2)	0.509	0.890
- Important social, occupational or recreational activities given up or reduced (item 3)	0.572	0.887
- Withdrawal symptoms; substance taken to relieve withdrawal (item 4)	0.680	0.880
- Failure to fulfill major role obligations (item 7)	0.668	0.880
- Use continues despite knowledge of adverse consequences (item 8)	0.617	0.884
- Tolerance (item 9)	0.475	0.891
- Craving, or a strong desire or urge to use (item 10)	0.677	0.880
- Persistent desire or repeated unsuccessful attempts to quit (item 11)	0.668	0.881
- Use in physically hazardous situations (item 12)	0.616	0.884
- Continued use despite social or interpersonal problems (item 13)	0.711	0.878
Kuder – Richardson alpha for symptom criteria (11-items)	0.893	
Kuder – Richardson alpha for the whole scale (13-items)	0.915	
Cronbach's Alpha for symptom continuous scores (11-items)	0.926	
Cronbach's Alpha for the whole scale continuous scores (13-items)	0.942	

\* Item 5 & item 6 were not included in analysis as recommended by the scale authors (1)

## DISCUSSION

The main aim of the present study was to develop an Arabic epidemiological tool for screening of FA. So, we selected the short form of the updated version of Yale scale (mYFAS 2.0) which copes with the most recent DSM-5 criteria for diagnosis of SUD<sup>(3)</sup> WHO guidelines for translation and cross-cultural adaptation were followed based on conceptual clarity of items rather than literal translation.<sup>(13)</sup> The study was conducted during influx of tourists to costal Alexandria (summer season). Participants of Egyptian and non-Egyptian Arab nationalities (Gulf citizens, Syrians, Palestinians, Jordanians, Sudanese and Tunisians) were included in our study so that cultural diversity in Arab region was represented. Schulte et al. developed and validated the mYFAS 2.0 on adults 18-81 and 19-74 years respectively.<sup>(3)</sup> Similarly, our study involved adults 18-65 years. Pregnancy state is associated with craving, so gravidas were excluded according to the authors of the earlier scales versions.<sup>(3,10)</sup> In scale scoring, symptom criterion scores (not raw scores) were added to produce the symptom count score. Clinical significance score was not added to this count during the process of diagnosis as it is not a discrete criterion. It is used to establish diagnosis as an indicator of the distress/impairment produced by the 11 criteria. So, as recommended by Meule et al.,<sup>(1)</sup> it is not logic to include raw scores or all of the 13 items for testing internal consistency. Accordingly, reliability statistics were applied to the 11 symptom criteria with exclusion of the clinical significance criteria. The resulting Kuder-Richardson alpha (using the binary criterion scores) was 0.89 indicating good internal consistency and scale reliability. This value was consistent with the previously calculated figure by Schulte et al (0.86) for the original mYFAS 2.0-EN. Calculation of Kuder-alpha for the total 13-items (0.92), as well as Cronbach's alpha for the 11-items (0.93) and the 13-items (0.94) were also performed for comparison with other studies adopting these models. Our Cronbach's alpha of raw scores agreed with the reported 0.91 alpha in the Italian version<sup>(7)</sup> and the 0.89 in the Brazilian translation<sup>(5)</sup> of the mYFAS 2.0. Both the current Kuder and Cronbach's alpha were comparable with those reported in the previous Egyptian Arabic version of the full YFAS 2.0 including all of the 35-items (0.89).<sup>(12)</sup>

In our study, corrected item-total correlation and decrease of Cronbach's alpha if item deleted indicated acceptable internal reliability and were in consistence with the results of the Italian mYFAS 2.0,<sup>(7)</sup> and the Arabic YFAS 2.0 versions.<sup>(12)</sup>

In the present study, 17.6% of the studied population fulfilled criteria for FA diagnosis. This rate is higher than the previously reported Egyptian figure (11.0%) among medical students (2017) using the full YFAS 2.0<sup>(12)</sup> The original mYFAS 2.0 (2017) described a rate of 13.1% among American population,<sup>(3)</sup> while the Italian version

(2018) reported 5.7%<sup>(7)</sup> and the Brazilian (2018) 4.3%.<sup>(6)</sup> Adopting the mYFAS 2.0 in USA (2018) revealed a rate of 15%.<sup>(15)</sup>

In the Arabic YFAS 2.0 (Egypt, 2017), most of FA cases were severe (5.1%) followed by mild (3.8%) then moderate (2.1%).<sup>(12)</sup> The same order was observed in our results (8.4%, 5.4% and 3.8% respectively). Cases were mainly moderate (5.2%) in the original mYFAS 2.0 (USA, 217)<sup>(3)</sup> and mild (3.8%) in the Italian version (2018).<sup>(7)</sup> The current study showed positive association between BMI and both symptom score and FA. In consistence, FA was previously associated with higher BMI in the original mYFAS 2.0 (USA, 2017)<sup>(3)</sup> and its Italian version (2018)<sup>(7)</sup> as well as in the original full YFAS 2.0 (USA, 2016)<sup>(10)</sup> and its Arabic version (Egypt, 2017).<sup>(12)</sup> Significant association with higher BMI, confined to female gender and older age (>45 years), was also observed in USA using the mYFAS 2.0 (2018).<sup>(15)</sup>

### Strengths & limitations

Using anonymous self-report questionnaires eliminates embarrassment and motivates correct scoring among affected individuals. Study setting limited conduction of test-retest reliability. Bilingual personnel in a non-probability sample may not be representative to the general population which limited generalization of results.

## CONCLUSION AND RECOMMENDATIONS

The present study adopted a reliable Arabic version of the mYFAS 2.0. In terms of reliability, the mYFAS 2.0-AR can be equivalent to the mYFAS 2.0-EN as well as to the Arabic version of the full YFAS 2.0. It can be used as a reliable tool for FA screening in epidemiological surveys among Arab countries.

The study recommends further multi-disciplinary population studies among different Arab nationalities to explore stability of the mYFAS 2.0-AR over time, assess magnitude of the problem, determine FA correlates and suggest appropriate interventions.

Examination of the mYFAS 2.0-AR among high risk population as obese and those with eating or mental disorders.

### Conflict of Interest

The authors declare that they have no competing interests.

## ACKNOWLEDGEMENTS

The authors acknowledge Erica M. Schulte, the author of original tool, Department of Psychology, University of Michigan for her prompt permission to translate the mYFAS 2.0. Authors also deeply acknowledge all authors who freely provided full-text of their recent articles. Many thanks for the translators and the Arabic professional. Sincere gratitude goes to Prof. Lobna Sultan, Neuro-Psychiatry Department, Faculty of Medicine, Alexandria University for revising the Arabic translation and for her helpful guidance and recommendations. We are greatly

thankful to Mohammad Gomaa, Alexandria University and Eman Sultan, Community Medicine Department, Faculty of Medicine, Alexandria University, for their efforts in data collection. Authors are grateful to Prof. Fathy El-Gamal and Prof. Asmaa Abdu El-Aziz, Community Medicine Department, Faculty of Medicine, Alexandria University, for revising the manuscript and for their valuable comments.

## REFERENCES

- 1- Meule A, Gearhardt AN. Ten Years of the Yale Food Addiction Scale: a Review of Version 2.0. *Curr Addict Rep* 2019;6:218-28.
- 2- Meule A, Gearhardt AN. Five years of the Yale Food Addiction Scale: taking stock and moving forward. *Curr Addict Rep* 2014; 1:193-205.
- 3- Schulte EM, Gearhardt AN. Development of the modified Yale Food Addiction Scale version 2.0. *Eur Eat Disord Rev* 2017;25:302-8.
- 4- World Health Organization. Body mass index - BMI. Available at: <http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi> Last access 13/10/2019
- 5- Nunes-Neto PR, Köhler CA, Schuch FB, Quevedo J, Solmi M, Murru A et al. Psychometric properties of the modified Yale Food Addiction Scale 2.0 in a large Brazilian sample. *Rev Bras Psiquiatr* 2018;40:444-8.
- 6- Nunes-Neto PR, Köhler CA, Schuch FB, Solmi M, Quevedo J, Maes M, et al. Food addiction: prevalence, psychopathological correlates and associations with quality of life in a large sample. *J Psychiatr Res* 2018;96:145-52.
- 7- Imperatori C, Fabbriatore M, Lester D, Manzoni GM, Castelnuovo G, Raimondi G et al. Psychometric properties of the modified Yale Food Addiction Scale version 2.0 in an Italian nonclinical sample. *Eat Weight Disord* 2019;24:37-45
- 8- Gearhardt AN, Corbin WR, Brownell KD. Preliminary validation of the Yale Food Addiction Scale. *Appetite* 2009;52:430-6.
- 9- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Washington, DC: American Psychiatric Association; 2013.
- 10- Gearhardt AN, Corbin WR, Brownell KD. Development of the Yale Food Addiction Scale Version 2.0. *Psychol Addict Behav* 2016;30:113-21.
- 11- Naguib RM. Personality profile and affect regulation in relation to food addiction in a sample of obese females [thesis]. Cairo: Faculty of Medicine, Ain Shams University; 2014.
- 12- Fawzi M, Fawzi M. Validation of an Arabic version of the Yale Food Addiction Scale 2.0. *East Mediterr Health J* 2018;24:745-52.
- 13- World Health Organization. Management of substance abuse: Process of translation and adaptation of instruments. Available at [https://www.who.int/substance\\_abuse/research\\_tools/translation/en/#](https://www.who.int/substance_abuse/research_tools/translation/en/#) Last access 1/10/2019
- 14- Petrie A, Sabin C. Medical Statistics at a Glance. 3rd edition. Chichester: John Wiley & Sons, Ltd; 2009.
- 15- Schulte EM, Gearhardt AN. Associations of food addiction in a sample recruited to be Nationally representative of the United States. *Eur Eat Disord Rev* 2018;26:112-9.

## Annex

## مقياس بيل لإدمان الطعام - الإصدار الثاني المعدل

## تعليمات:

يسأل هذا الاستقصاء عن عاداتك الغذائية في العام الماضي. يصعب على الأشخاص في بعض الأحيان التحكم في مقدار ما يتناولونه من أطعمة معينة مثل:

- الحلويات: مثل الآيس كريم والشوكولاتة والدونات والكوكيز والكيك والحلوى
- النشويات: مثل الخبز الأبيض والمخبوزات والمكرونات والأرز
- الوجبات الخفيفة المالحة: مثل رقائق البطاطس/البطاطا (الشيبسي) و رقائق الذرة (الدوريتوس) وغيرها و المقرمشات والبسكويت المالح
- الأطعمة الدهنية: مثل شرائح اللحم والهامبرجر والهامبرجر بالجبن والبيتزا والبطاطس المقلية
- المشروبات السكرية: مثل المشروبات الغازية والمشروبات الرياضية ومشروبات الطاقة

عند السؤال عن "بعض الأطعمة" في الفقرات التالية يرجى التفكير في أي أطعمة أو مشروبات مماثلة لتلك المذكورة في مجموعات الأطعمة أو المشروبات أعلاه أو أي أطعمة أخرى كنت قد واجهت معها صعوبة في العام الماضي .

مطلقا	أقل من مرة شهريا	مرة شهريا	2-3 مرات شهريا	3-4مرات أسبوعيا	4-6مرات أسبوعيا	يومية	خلال الـ 12 شهرا الماضية:
0	1	2	3	4	5	6	1. تناولت الطعام إلى حد الشعور بالتخمة (داء يصيب الإنسان من أكل الطعام الثقيل أو من كثرة الأكل أو من غسر الهضم).
0	1	2	3	4	5	6	2. قضيت الكثير من الوقت في الشعور بالخمول أو التعب بسبب الإفراط في تناول الطعام.
0	1	2	3	4	5	6	3. لقد تجنبتي أنشطة بالعمل / المدرسة وأنشطة اجتماعية (كالاحتفالات والعزائم والأفراح) لأنني كنت خائفاً من الإفراط في تناول الطعام خلالها.
0	1	2	3	4	5	6	4. عندما كنت أعاني من اضطرابات المزاج ( كنتعكر المزاج ، التوتر، العصبية، الانفعال ) لأنني لم أتناول أطعمة معينة، كنت أضطر لتناول هذه الأطعمة لأشعر بتحسن.
0	1	2	3	4	5	6	5. أسلوبني في تناول الطعام سبب لي الكثير من المعاناة النفسية ( كالضيق، التوتر، كراهية النفس، الشعور بالذنب).
0	1	2	3	4	5	6	6. واجهت مشاكل كبيرة في حياتي بسبب الطعام وأسلوبني في تناوله؛ قد تكون مشاكل في روتين حياتي اليومي أو في عملي/مدرستي أو مع أصدقائي أو عائلتي أو متاعب صحية.
0	1	2	3	4	5	6	7. إفراطي في تناول الطعام أعاقني عن رعاية أسرتي أو القيام بالأعمال المنزلية.
0	1	2	3	4	5	6	8. ظلت أنتناول الطعام بنفس الأسلوب رغم أن أسلوبني تسبب لي في مشكلات نفسية.
0	1	2	3	4	5	6	9. تناولت نفس الكمية من الطعام لم يعطني نفس القدر السابق من اللذة.
0	1	2	3	4	5	6	10. كان لدي رغبة قوية ملحة لتناول أطعمة معينة لدرجة منعتني من التفكير في أي شيء آخر إلا فيها.
0	1	2	3	4	5	6	11. حاولت وفشلت في خفض أو التوقف عن تناول أطعمة معينة.
0	1	2	3	4	5	6	12. كنت منهمكا جدا في تناول الطعام في مواقف تحتاج للإنتباه مما قد يعرضني للأذى (مثلا عند قيادة السيارة، أو عبور الشارع، أو تشغيل الآلات).
0	1	2	3	4	5	6	13. كان أصدقائي/أفراد أسرتي قلقين ويعبرون عن مخاوفهم و انزعاجهم من مدى إفراطي في تناول الطعام.