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ISSN
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STANDARD
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INTERNATIONAL CENTRE

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Crossref



ISSN: 2992-8982

<https://yashil-iqtisodiyot-taraqqiyot.uz/>

2025



IQTISODIYOT&TARAQQIYOT

Ijtimoiy, iqtisodiy, texnologik, ilmiy, ommabop jurnal

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Elektron nashr. 295 sahifa.

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Muassis: "Ma'rifat-print-media" MChJ

Hamkorlarimiz: Toshkent davlat iqtisodiyot universiteti, O'zR Tabiat resurslari vazirligi, O'zR Bosh prokuraturasi huzuridagi IJQK departamenti.

Jurnalning ilmiyligi:

“Yashil” iqtisodiyot va taraqqiyot” jurnali

O'zbekiston Respublikasi
Oliy ta'lim, fan va innovatsiyalar
vazirligi huzuridagi Oliy
attestatsiya komissiyasi
rayosatining
2023-yil 1-apreldagi 336/3-
sonli qarori bilan ro'yxatdan
o'tkazilgan.



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VALIDATION OF THE DUTCH EATING BEHAVIOUR QUESTIONNAIRE (DEBQ) IN A SAMPLE OF UZBEK WOMEN

Khursana Usmanova

Former master's student (Public Health)
Westminster International University in Tashkent

Dr Muhammad Bilal (PhD, DSc)

Senior Lecturer, School of Business & Economics
Westminster International University in Tashkent

Email: m.bilal@wiut.uz

ORCID: 0000-0003-2241-4610

Dilafruz Qo'chqorova

Part-time PhD student at Westminster International University in Tashkent

Email: dqochqorova@wiut.uz

Abstract: The study uses Uzbek and Russian versions of the DEBQ to understand women's eating behaviour based on emotional, external, and restrained theories. The DEBQ was administered to 76 Uzbek obese female patients at the Republican Specialised Scientific and Practical Medical Centre of Endocrinology in Tashkent, Uzbekistan. We employed an ordered probit model to determine if emotional eating behaviour (factor 1), restrained eating behaviour (factor 2), and external eating behaviour (factor 3), including respondents' socioeconomic characteristics (for example, age and occupation status), could predict female obese categories. The DEBQ's structure was assessed using exploratory factor analysis to retain the relevant factors. The results confirmed that there was a statistically significant difference in the mean of external eating behaviour (factor 3) for each of the obese categories (p -value $> F = 0.003$) and occupation status (p -value $> F = 0.003$). Bartlett's equal-variances test also supported the assumption of equal variances in the groups for external eating behaviour for each occupation status ($\chi^2(2) = 0.436$, p -value $> \chi^2 = 0.804$). Ordered probit estimates revealed that the respondents' age positively influenced the probability of being in obesity class III. In contrast, occupation status negatively influenced the probability of being in obesity class III. Most importantly, the restrained eating behaviour (factor 2) and external eating behaviour (factor 3) were strongly pronounced for the obesity class III by (+17%) and (+24%), respectively. Policy recommendations include awareness regarding external eating behaviours and strengthening targeted obesity-controlled programs. In addition, providing employment opportunities to Uzbek women with class III obesity could significantly lower their obesity status. Finally, the findings will help the government health sector to understand the critical factors that influence obesity status and help them to make improvements accordingly.

Key words: DEBQ, eating behaviour, emotional eating, external eating, restrained eating, obesity, overweight, Uzbekistan.

Annotatsiya: Ushbu tadqiqot ayollarning ovqatlanish xatti-harakatlarini hissiy, tashqi va o'zini tiyish nazariyalariga asoslangan holda tushunish uchun DEBQning o'zbek va ruscha versiyalaridan foydalanadi. So'rovnomma Toshkent shahridagi Respublika ixtisoslashtirilgan ilmiy-amaliy Endokrinologiya tibbiyot markazida davolanayotgan 76 nafar semizlikdan aziyat chekayotgan o'zbek ayollariga qo'llanildi. Tadqiqotda ayollarning semizlik toifasini prognoz qilish uchun hissiy ovqatlanish (1-omil), o'zini tiyib ovqatlanish (2-omil) va tashqi ta'sirga asoslangan ovqatlanish (3-omil) kabi xatti-harakatlar, shuningdek, respondentlarning ijtimoiy-iqtisodiy xususiyatlari (masalan, yosh va bandlik holati) asosida tartibli probit modeli qo'llanildi. DEBQning tuzilmasi tegishli omillarni aniqlash maqsadida eksploratoriya faktor tahlili yordamida baholandi. Natijalar tashqi ovqatlanish xatti-harakati (3-omil) bo'yicha semizlik toifalari o'rtasida statistik jihatdan ahamiyatli farq borligini tasdiqladi ($p > F = 0.003$), hamda bu xatti-harakatlar bandlik holatiga ko'ra ham statistik ahamiyatga ega ekanligini ko'rsatdi ($p > F = 0.003$). Bartlett teng dispersiyalar testi ham har bir bandlik holati bo'yicha tashqi ovqatlanish uchun guruhlar o'rtasida dispersiyalar tengligi farazini qo'llab-quvvatladi ($\chi^2(2) = 0.436$, $p > \chi^2 = 0.804$). Tartibli probit baholash natijalari shuni ko'rsatdiki, respondentlarning yoshi ularning III darajali semizlik holatida bo'lish ehtimolini ijobiy ravishda oshiradi, aksincha, bandlik holati ushbu ehtimolni salbiy tomonga kamaytiradi. Eng muhimi, o'zini tiyib ovqatlanish (2-omil) va tashqi ovqatlanish (3-omil) xatti-harakatlari III darajali semizlik holatida mos ravishda +17% va +24% kuchli ifodalangan. Siyosiy tavsiyalar sifatida tashqi ovqatlanish xatti-harakatlariga oid xabardorlikni oshirish hamda semizlikni nazorat qilishga qaratilgan dasturlarni kuchaytirish taklif etiladi. Bundan tashqari, III darajali semizlikka ega o'zbek ayollar uchun ish bilan ta'minlash imkoniyatlarini yaratish ularning semizlik darajasini sezilarli darajada kamaytirishi mumkin. Yakuniy xulosa sifatida, ushbu tadqiqot natijalari sog'liqni saqlash sohasidagi mutasaddilarga semizlikka ta'sir qiluvchi muhim omillarni aniqlash va tegishli chora-tadbirlarni ishlab chiqishda yordam beradi.



Kalit so'zlar: DEBQ, ovqatlanish xatti-harakati, hissiy ovqatlanish, tashqi ovqatlanish, cheklangan ovqatlanish, semizlik, ortiqcha vazn, O'zbekiston.

Аннотация: В исследовании используются узбекская и русская версии опросника DEBQ для анализа пищевого поведения женщин на основе теорий эмоционального, внешнего и сдержанного питания. Опрос DEBQ был проведён среди 76 узбекских пациенток с ожирением в Республиканском специализированном научно-практическом медицинском центре эндокринологии в Ташкенте, Узбекистан. Была применена упорядоченная пробит-модель для определения того, могут ли эмоциональное пищевое поведение (фактор 1), сдержанное пищевое поведение (фактор 2) и внешнее пищевое поведение (фактор 3), а также социально-экономические характеристики респондентов (например, возраст и статус занятости), предсказать категории ожирения у женщин. Структура DEBQ была оценена с использованием эксплораторного факторного анализа с целью выделения релевантных факторов. Результаты подтвердили наличие статистически значимых различий в среднем значении внешнего пищевого поведения (фактор 3) между категориями ожирения (p -значение $> F = 0,003$) и статусом занятости (p -значение $> F = 0,003$). Тест Бартлетта на равенство дисперсий также подтвердил предположение о равных дисперсиях между группами по внешнему пищевому поведению в зависимости от статуса занятости ($\chi^2(2) = 0,436$; p -значение $= 0,804$). Оценки по упорядоченной пробит-модели показали, что возраст респондентов положительно влияет на вероятность отнесения к III степени ожирения, в то время как статус занятости оказывает отрицательное влияние. Особенно важно отметить, что сдержанное (фактор 2) и внешнее (фактор 3) пищевое поведение были наиболее выражены у женщин с ожирением III степени — на +17% и +24% соответственно. Исходя из данного исследования, мы рекомендуем повысить осведомленность о внешнем пищевом поведении и усилить целевых программ по контролю над ожирением. Кроме того, предоставление возможностей трудоустройства женщинам с ожирением III степени может существенно снизить уровень их ожирения. Полученные результаты помогут сектору здравоохранения лучше понять ключевые факторы, влияющие на степень ожирения, и принять соответствующие меры для её снижения.

Ключевые слова: DEBQ, пищевое поведение, эмоциональное питание, внешнее питание, сдержанное питание, ожирение, избыточный вес, Узбекистан.

INTRODUCTION

Eating habits are shaped by psychological, cultural, and environmental factors, all of which affect health and well-being [1]. Understanding these influences is key to promoting healthy diets and preventing eating disorders, especially in different cultural settings [2]. The causes of obesity and being overweight have been broadly explored, and the available research divides them into genetic, metabolic, behavioural, and psychological [3]. In addition, the dependence on a limited number of food groups, such as cereals, contributes on average 70 percent of the daily energy supply (in kcal per capita per day). This heavy dependence on cereals contributes to obesity and accelerates food insecurity and malnutrition in Central Asia. In particular, Uzbekistan's cereal consumption contributes over 60% of the daily energy supply, which may lead to higher obesity in the region [4,5].

Factors contributing to obesity in Uzbekistan include changes in lifestyle, diet, and physical activity patterns due to urbanization, economic development, and globalization. World Health Organization (WHO) reports that Uzbekistan's average body mass index is 26.5 kg/m²— the highest in Central Asia. By 2060, the economic loss from obesity is expected to increase to \$21.6 billion, equivalent to 4.7% of GDP [6]. Non-communicable diseases like heart conditions, diabetes, cancer, and lung disorders are a growing concern in Uzbekistan, causing 81% of all deaths [7]. In 2014, nearly half of adults were overweight or obese, and over half of those aged 30–54 had high cholesterol. Physical inactivity is also widespread, with only 16.4% of adults getting enough weekly exercise [8].

LITERATURE REVIEW ON THE TOPIC

The behavioural and psychological extent includes three significant theories of excessive food intake – emotional (psychosomatic), externality, and restraint behaviours [9]. Emotional theory (also known as psychosomatic) redirects various emotional states, such as anxiety, stress, and fear, into uncontrolled eating [10]. However, it includes both under-eating and over-eating, resulting from childhood experience and genetic predisposition [11]. Externality theory disregards various metabolic inclinations and focuses on food consumption behaviour influenced by external factors such as the sight and smell of food and observations of other people's food consumption [12]. Restraint theory connects overeating with strict dieting, when, due to various triggers, including hunger from constant dieting, an individual may face depression, anxiety, mental distress, etc—as a result, eating behaviour shifts towards extreme amounts of food intake [13,14].

The Dutch Eating Behaviour Questionnaire (DEBQ) is a widely used instrument designed to assess various aspects of eating behaviour, including external eating behaviour, which refers to eating in response to



external cues rather than internal hunger or satiety cues [15,16]. The Dutch Eating Behaviour Questionnaire (DEBQ) was devised and formulated to evaluate and incorporate all three theories, comprising 33 questions (see Appendix Table A1) with responses based on a 5-point psychometric scale (1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often) [9]. The emotional eating theory comprises 13 questions on the connection between emotions and behaviour; the external eating theory includes 10 questions on the connection between environmental cues and behaviour; and the restrictive eating theory contains 10 questions on the connection between self-imposed limitations and behaviour (Table 2). Only Question 31 is a reversed scale type (1=very often, 2=often, 3=sometimes, 4=seldom, 5=never).

This paper explores the role of eating behaviour, assessed using the Dutch Eating Behaviour Questionnaire (DEBQ), in obesity and provides recommendations for its reduction. It was made and tested mainly in Western Europe, but people worldwide have used it in studies. However, there is little research about Uzbek's eating behaviour and how it affects their health. We implemented DEBQ in Uzbekistan and interviewed 76 Uzbek female patients at the Republican Specialized Scientific and Practical Medical Centre of Endocrinology in Tashkent. The respondents filled in the questionnaires in Uzbek and Russian due to the bilingual population in Uzbekistan. Thus, DEBQ's Russian translation was used for dissemination and cross-reference with the translated Uzbek version [17].

This paper is structured as follows: the next section presents the methodology, followed by the results and discussion in Sections 4 and 5, respectively. Finally, Section 6 concludes the paper and discusses policy implications.

METHODOLOGY

Data methodology

A total of 76 participants were interviewed at the Republican Specialised Scientific and Practical Medical Centre of Endocrinology in Tashkent, Uzbekistan. Patients who had appointments with endocrinologists at the Centre were approached, and those who voluntarily agreed to participate in the research with no financial incentives signed an informed consent form. After the appointment with the specialist, the respondents were offered to fill in the questionnaire either in electronic format via Google Forms or in pen-and-paper format. Overall, thirteen cases were excluded from the analysis due to missing information and incomplete answers, resulting in 63 responses in the final data set.

The Dutch Eating Behaviour Questionnaire (DEBQ)

The DEBQ survey includes 33 questions grouped under three eating behaviour theories. Regardless of the country under study, it focuses on how these 33 items have similar responses. Responses are based upon a 5-point Likert scale (1=never, 2=seldom, 3=sometimes, 4=often, 5=very often). The emotional eating theory comprises 13 questions on the connection between emotions and behaviour; the external eating theory includes 10 questions on the connection between environmental cues and behaviour; and the restrictive eating theory contains 10 questions on the connection between self-imposed limitations and behaviour. The only exception is question number 31, a reversed scale type (1=very often, 2=often, 3=sometimes, 4=seldom, 5=never; See Appendix).

Factor analysis

We employed factor analysis to check the robustness of the response from DEBQ because of the high correlation among the responses. The purpose of factor analysis is to model a certain number of factors to explain interrelationships among items, focusing on variance. Then, it is positioned into common variance and unique variance. Reducing the variables during the analysis is important to interpret the results and draw conclusions. These can be done through factor extraction (choice of a model and number of factors) and factor rotation (achievement of simplicity for interpretation). The eigenvalue explains the variance, which is usually positive and represents how well the model is conditioned.

Description of Dependent and Independent Variables

Table 1 and Table 2 present the detailed descriptive statistics of emotional eating behaviour (factor 1), restrained eating behaviour (factor 2), and external eating behaviour (factor 3), including respondents' socioeconomic characteristics (for example, age and occupation status). The recruitment involved female patients aged 18 and above, with a mean age of 28.6 and a standard deviation of 7.13, who reported having issues with weight. All the participants were asked to self-report their names or medical card numbers, age, height, weight, and occupations. Body mass index (BMI) was calculated based on the information provided with the following formula: height (cm)/weight (kg). The mean BMI for the sample was 44.34, and the standard deviation was 7.84.

Empirical framework

The construction of obesity status based on the recommended BMI thresholds resulted in an explicit ordinal nature of the dependent variables [18]. Hence, for the subsequent analysis, we employed the ordered probit model to determine if emotional eating behaviour (factor 1), restrained eating behaviour (factor 2), and external eating behaviour (factor 3), including respondents' socioeconomic characteristics (for example, age and occupation status), could predict obesity status of varying order (see Table 3). The empirical framework employs the ordered probit model [19] to examine the socioeconomic characteristics of respondents and determine their fast-food preferences. The dependent variable ($j = 0, 1, 2, \dots, J$) is given three ordinal categories: Obesity class I, Obesity class II, and Obesity class III. Hence, the model is as follows:

$$y_i^* = z_i'\beta + \varepsilon_i, \quad \varepsilon_i \sim \text{NID}(0,1)$$

y_i^* = unobserved or latent variable

y_i = observed variable not in the equation

$y_i = 0$ if $y_i^* \leq Y_1$,

$y_i = 1$ if $Y_1 < y_i^* \leq Y_2$,

$y_i = 2$ if $Y_2 < y_i^*$,

Where z_i' is a set of different eating behaviours, including respondents' socioeconomic characteristics (for example, age and occupation status) and β are the estimated parameters for the corresponding eating behaviours, including respondents' socioeconomic characteristics (for example, age and occupation status), the stochastic disturbance term ε_i is assumed to be NID (0, 1). Here Y is an unknown cut point (or threshold parameter, if y takes three adoption responses, then there will be two cut points, Y_1 and Y_2).

ANALYSIS AND RESULTS

This section describes the estimates of the descriptive statistics of independent variables and the ordered probit model.

Exploratory Factor Analysis (EFA)

The DEBQ was analysed using exploratory factor analysis (EFA) with varimax rotation. Factors were selected based on eigenvalues ≥ 1.0 , scree plot results, and loadings ≥ 0.30 . For clarity and consistency with similar research, the eigenvalue threshold was raised to 2 (see Appendix Table A2 & Figure A2) [20]. This allowed us to control for the factors that do not contribute much to the variation and explanation of the data, leaving only the most significant factors to be used for the analysis. Therefore, for subsequent analysis, we retained the number of factors decreased to 3 (see Appendix Figures 1 and 2). The Cronbach alpha statistic tested the scale's reliability coefficient, and the value for the scale was $\alpha = 0.88$. We also observed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy = 0.75, suggesting the data adequacy for EFA. To test the hypothesis whether the correlation matrix is an identity matrix, we performed Bartlett's test of sphericity ($\chi^2(528) = 1679.37$ p-value $> \chi^2 = 0.000$). This indicates that the robustness and appropriateness of the factor analysis are maintained.

The recruitment involved female patients aged 18 and above, with a mean age of 28.6 and a standard deviation of 7.13, who reported having issues with weight. All the participants were asked to self-report their names or medical card numbers, ages, height, weight, and occupations. Body mass index (BMI) was calculated based on the provided information using the following formula: height (cm) / weight (kg). However, BMI is an oversimplified and often misleading measure of health [21]. The mean BMI for the sample was 44.34, and the standard deviation was 7.84.

Table 1. Descriptive Statistics (N=63)

Variable	Mean	Std. Dev.	Min	Max
Age	28.60	7.13	18	52
Occupation status	2.19	0.84	1	3
Weight	73.55	13.44	49	109
Height	1.65	0.07	1.52	1.86
BMI index	44.34	7.84	31.21	68.98



Table 2. Frequency distribution of occupation status

Occupation status	Frequency	Percent	Cumulative
Student	17	26.98	26.98
Homemaker	17	26.98	53.97
Employed	29	46.03	100.00
Total	63	100.00	

Classification of Obesity Status

Table 3 presents the frequency distribution of the respondents regarding obesity status. To construct the dependent variable “obesity status”, we followed guidance from the NIHR Bristol Biomedical Research Centre. The respondents were categorised as follows: if “BMI = 30 and ≤ 34.9 reflect Obesity class I”, “BMI = 35 and ≤ 39.9 reflect Obesity class II”, and “BMI > 40 and above reflect Obesity class III” [22]. To compare the mean and variance of emotional eating behaviour (factor 1), restrained eating behaviour (factor 2), and external eating behaviour (factor 3) against occupation status and obesity status, we employed One-way ANOVA with the Bonferroni comparison test. The results confirmed that there was a statistically significant difference in the mean of external eating behaviour (factor 3) for each of the obese categories (p -value $> F = 0.003$) and occupation status (p -value $> F = 0.003$). Bartlett’s equal-variances test also supported the assumption of equal variances in the groups for external eating behaviour for each of the obese categories (chi-squared (2) = 3.0813, p -value $> \chi^2 = 0.214$). Similarly, Bartlett’s equal-variances test also supported the assumption of equal variances in the groups for external eating behaviour for each occupation status (chi-squared (2) = 0.4363, p -value $> \chi^2 = 0.804$). Likewise, much to our surprise, there was no significant difference in the mean of emotional eating behaviour (factor 1) and restrained eating behaviour (factor 2) against occupation and obesity.

Table 3 Frequency distribution of obesity status

	Ordered	Frequency	Percent
Obesity class I	0	7	11.11
Obesity class II	1	11	17.46
Obesity class III	2	45	71.43
Total		63	100.00

Determinants of obesity status

Table 4 presents the marginal effects estimates of the ordered probit model. The age of the respondents positively influenced the probability of obesity class III by +3%, while the probability of being in obesity class II (-2%) decreased. The occupation status of the respondents negatively influenced the probability of being in obesity class III by (-19%); however, no significant relationship was observed between occupation status and obesity class I and obesity class II, given the positive marginal effects. Most importantly, the restrained and external eating behaviours were strongly pronounced for the obesity class III by (+17%) and (+24%), respectively. At the same time, no significant relationship was observed between restrained and external eating behaviour with obesity class I and obesity class II, given negative marginal effects. Interestingly, the emotional eating behaviour appeared insignificant for all obese categories. The last row of Table 4 indicates a higher p -value; hence, the explanatory power of the predictions squared is held. In addition, we could not reject the parallel regression assumption (chi-squared (2) = 3.126, p -value $> \chi^2 = 0.681$), which justified that there was no violation of parallel assumptions.



Table 4 Estimates of the ordered probit models

Variables	Coef.	Std. Err.	Marginal Effects		
			Obesity class I	Obesity class II	Obesity class III
Emotional eating behaviour	-0.060	0.201	0.006	0.013	-0.018
Restrained eating behaviour	0.564***	0.202	-0.052	-0.119	0.171***
External eating behaviour	0.815***	0.208	-0.075	-0.171	0.247***
Age of the respondent	0.114***	0.04	-0.011	-0.024**	0.034***
Occupation status	-0.629**	0.288	0.058	0.132	-0.190**
Y_1	0.172	0.876			
Y_2	1.138	0.885			
Number of observations	63				
LR χ^2 (5)	24.97***				
Loglikelihood	-37.23				
Linktest p-value	0.82				

Notes: *** p<.01, ** p<.05, * p<.1

The current study aimed to examine the DEBQ questionnaire [9], which has been an effective method used by international researchers to explain and draw relations between obesity and eating behaviours. The validity of the DEBQ was evaluated using exploratory factor analyses, which initially yielded a six-factor solution and ultimately led to a three-factor solution. It replicated three theories of the DEBQ – emotional, external, and restrained eating, with 54% variance. This has proved the effectiveness of the external factor analyses and is a good fit for the original version of the DEBQ. Effective obesity prevention is considered to prevent a rise in the mean community BMI, indicating a strong correlation between the average adult BMI at the population level and the share of adults with obesity [23]. Even though the data collection was done among the patients referred with a BMI that reflects obesity, if the below-proposed interventions are to be made and retained, at least the Obesity Class I sample size can shift below the obesity line.

Strategies for improvement in the community mean comprehensive community-based education and Behaviour Change Communication (BCC) strategies (based on individual approach), and different tools can be used within these strategies, such as educational mass-media campaigns, school-based interventions, community-led programmes, peer-to-peer training, and networking [24]. The results regarding the obesity problem are not so impressive due to the general population being aware of it and many people aiming to control their weight, as indicated by the responses to the External Eating questions and Factor 3. Strategies that go beyond education are more effective, including low-fat food promotion or a healthy lifestyle.

The two possible areas for targeting the reduction of obesity - physical activity and quality of diet - depend on the population's life circumstances and economic conditions. Increasing physical activity should go through community-based interventions or long-term environmental changes incorporated into everyday life. A healthy diet must be considered based on the nutrient/energy ratio. Community-wide prevention programmes also focus on reducing risk factors: smoking, high blood pressure, high blood cholesterol, and obesity. The programme was implemented in Uzbekistan within WHO pilots in 2018 in the Ferghana and Kashkadarya regions, in 2022, and at present in the Syrdarya region. Obesity is more complex to control than other risk factors, and the research among the Uzbek female population has shown that all three theories and food consumption behaviours are present. Until today, the primary focus has not been on obesity (as a risk factor), and community campaigns have not addressed or attempted to achieve behavioural change. The existing literature and the WHO Consultation on Obesity identify that the long-term involvement of various stakeholders (mass media, food production industry, civil society, and government) has demonstrated more sustainable change [25].



CONCLUSION AND SUGGESTIONS

The study aimed to analyse female food intake with the Uzbek and Russian versions of the DEBQ and explain the relationship with weight gain. The DEBQ's structure was assessed by exploratory factor analysis, and the sample was measured by the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. Besides, the relationship between the DEBQ's weight status and occupation was compared with the Bonferroni test. The pilot DEBQ among overweight females in Uzbekistan highlighted the effectiveness and validity of the foundation for endocrinology and behavioural science research in the country. It also provided a basis for evaluating the eating behaviour and clinical conditions in various medical specialised areas. Policy recommendations include awareness regarding external eating behaviours and strengthening targeted obesity-controlled programs. In addition, providing employment opportunities to Uzbek women with class III obesity could significantly improve their obesity status. Finally, the findings will help the government health sector to understand the critical factors that influence obesity status and help them to make improvements accordingly.

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APPENDIX

Table A1 The Dutch Eating Behaviour Questionnaire (DEBQ) questionnaire.

Emotional eating behaviour

- Q11. Do you have the desire to eat when you are irritated?
- Q12. Do you have a desire to eat when you have nothing to do?
- Q13. Do you have a desire to eat when you are depressed or discouraged?
- Q14. Do you have a desire to eat when you are feeling lonely?
- Q15. Do you have a desire to eat when someone lets you down?
- Q16. Do you have a desire to eat when you are cross?
- Q17. Do you have a desire to eat when you are approaching something unpleasant to happen?
- Q18. Do you have a desire to eat when you are anxious, worried, or tense?
- Q19. Do you have a desire to eat when things are going against you or when things have gone wrong?
- Q20. Do you have a desire to eat when you are frightened?
- Q21. Do you have a desire to eat when you are disappointed?
- Q22. Do you have a desire to eat when you are emotionally upset?
- Q23. Do you have a desire to eat when you are bored or restless?

External eating behaviour

- Q24. If food tastes good to you, do you eat more than usual?
- Q25. If food smells and looks good, do you eat more than usual?
- Q26. If you see or smell something delicious, do you have a desire to eat it?
- Q27. If you have something delicious to eat, do you eat it straight away?
- Q28. If you walk past the baker, do you have the desire to buy something delicious?
- Q29. If you walk past a snack bar or a café, do you have the desire to buy something delicious?
- Q30. If you see others eating, do you also have the desire to eat?
- Q31. Can you resist eating delicious food?
- Q32. Do you eat more than usual when you see others eating?
- Q33. When are you preparing a meal, are you inclined to eat?

Restrained eating behaviour

- Q1. If you have put on weight, do you eat less than you usually do?
- Q2. Do you try to eat less at mealtimes than you would like to eat?
- Q3. How often do you refuse food or drink offered because you are concerned about your weight?
- Q4. Do you watch exactly what you eat?
- Q5. Do you deliberately eat foods that are slimming?
- Q6. When you have eaten too much, do you eat less than usual the following days?
- Q7. Do you deliberately eat less in order not to become heavier?
-

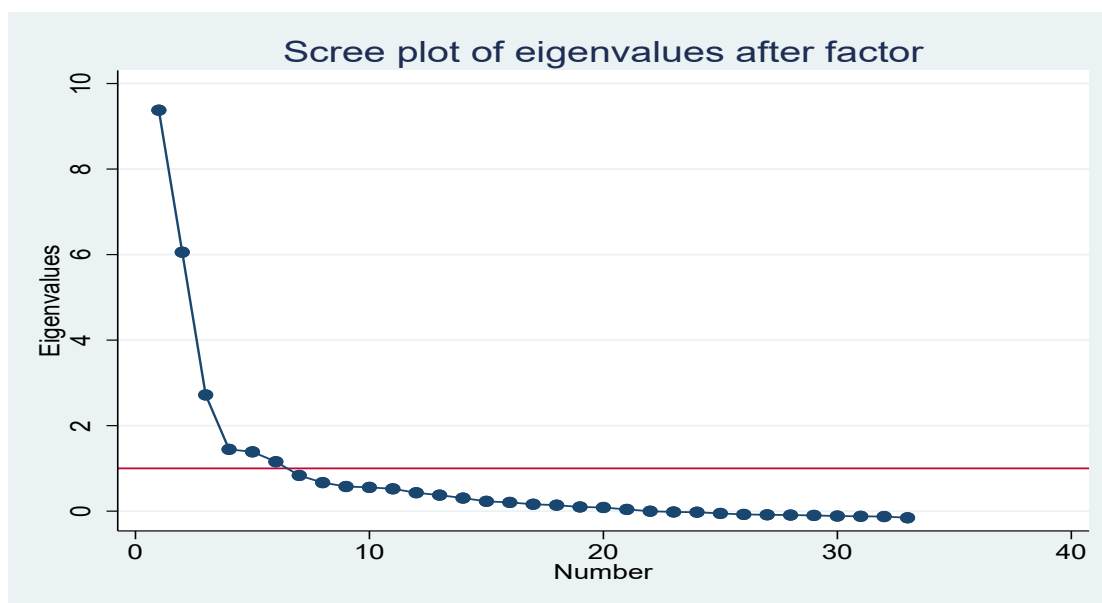


Figure A1. Scree plot of eigenvalue 1

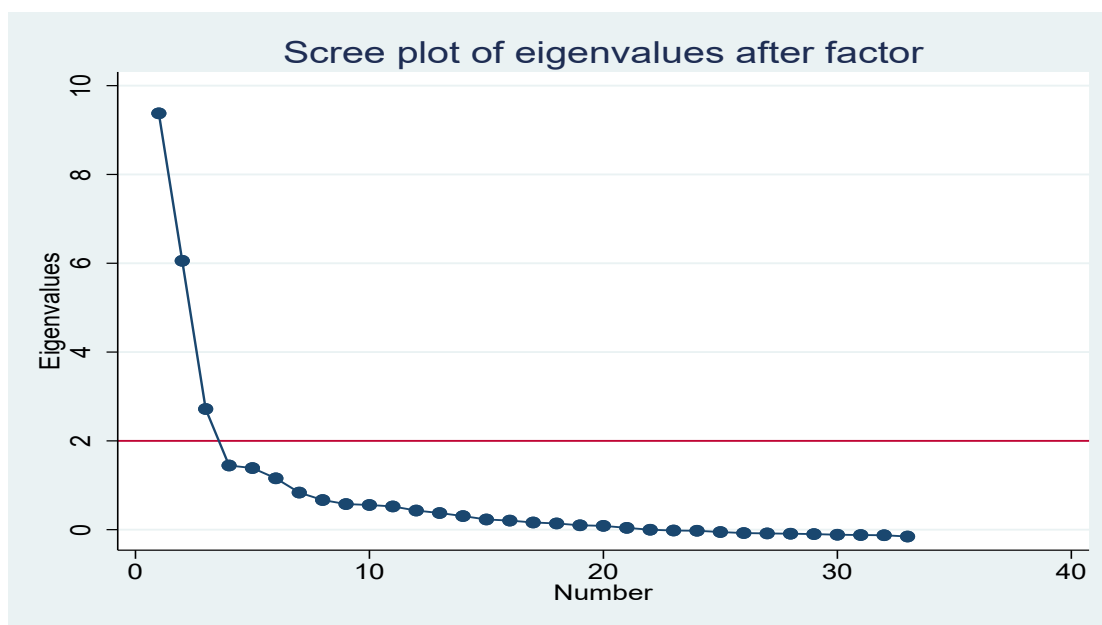


Figure A2. Scree plot of eigenvalue 2

Table A2 Rotated factor loadings (pattern matrix) and unique variances.

Questions	Factor 1	Factor 2	Factor 3
q1		0.651	
q2		0.785	
q3		0.732	
q4		0.555	
q5		0.832	
q6		0.734	
q7	-0.311	0.803	
q8		0.722	
q9		0.58	
q10		0.431	



q11	0.583	0.321	0.405
q12			
q13	0.728		
q14	0.692		
q15	0.765		
q16	0.873		
q17	0.728		
q18	0.853		
q19	0.719		
q20	0.769		
q21	0.726		
q22	0.737		
q23	0.535	0.324	
q24		-0.443	0.612
q25	0.474	-0.422	0.395
q26	0.363	-0.352	0.651
q27			0.709
q28			0.823
q29		0.348	0.637
q30	0.387		0.434
q31	-0.364		
q32	0.476		0.541
q33		0.417	

Notes: Blanks represent (loading) <0.3



IQTISODIYOT & TARAQQIYOT

Ijtimoiy, iqtisodiy, texnologik, ilmiy, ommabop jurnal

Ingliz tili muharriri: Feruz Hakimov

Musahhih: Zokir ALIBEKOV

Sahifalovchi va dizayner: Oloviddin Sobir o'g'li

2025. № 9

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El.Pochta: sq143235@gmail.com

Bot: @iqtisodiyot_77

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Litsenziya raqami: №046523. PNFL: 30407832680027

Manzilimiz: Toshkent shahar, Mirzo Ulug'bek tumani
Kumushkon ko'chasi, 26-uy.



Jurnal sayti: <https://yashil-iqtisodiyot-taraqqiyot.uz>
