Nutrición Hospitalaria

Trabajo Original

Nutrición en el anciano

Validity and reliability of SCREEN II (Seniors in the Community: Risk Evaluation for Eating and Nutrition) search in Turkish society

Validez y fiabilidad de la escala de evaluación de riesgos para la alimentación y la nutrición (SCREEN II) en la sociedad turca

Ayse Ceren Yilmaz[1], Esen Karaca[2], Ismail Özkaya[3]

[1]Health Sciences Institute, Nutrition and Dietetics. Acibadem Mehmet Ali Aydınlar University. Atasehir, Istanbul. Turkey. [2]Faculty of Health Sciences, Nutrition and Dietetics. Izmir Demokrasi University. Konak, Izmir. Turkey. [3]Health School, Nutrition and Dietetics. Kirklareli University. Kirklareli, Turkey

Abstract

Objective: the aim of this study is to determine the reliability and the validity of the Seniors in the Community: Risk Evaluation for Eating and Nutrition (SCREEN II) scale, which has been developed with the aim of evaluating eating and nutrition risks.

Methods: a total of 207 elderly were included in the study. The Standardized Mini Mental Test (SMMT) was applied to individuals for mental adequacy assessment and then SCREEN II scale was applied. For the selection of scale items, main components factor analysis and Varimaks conversion has been applied to the data and it has been decided to use the components which have 0.40 and bigger factor loading.

Results: in accordance with the validity and reliability analyzes, it was determined that the 3 subscales and 12-item adaptation of the screen scale were suitable for Turkish society. These subscales are "Food intake and eating habits", "Conditions and difficulties affecting food intake" and "Weight change and food restriction". When the Cronbach alpha internal consistency values were evaluated for the reliability of the SCREEN II scale, the obtained values indicated that the items in each subscale were consistent with each other and formed a whole.

Conclusion: the findings have shown that SCREEN II is a reliable and valid scale for the elderly people living in Turkey.

Resumen

Objetivo: el objetivo de este estudio es determinar la fiabilidad y la validez de la escala de evaluación de riesgos para la alimentación y la nutrición en adultos mayores en la comunidad (SCREEN II, por sus siglas en inglés), que se ha desarrollado con el objetivo de evaluar los riesgos alimentarios y nutricionales de las personas mayores.

Métodos: se incluyeron en el estudio un total de 207 personas mayores. Se aplicó el SMMT (Standardized Mini-Mental Test) para la evaluación de función cognitiva y luego se aplicó la escala SCREEN II. Para la selección de ítems de la escala, se han aplicado a los datos el análisis factorial de componentes principales y la conversión de Varimaks, y se ha decidido utilizar los componentes que tienen una carga factorial de 0,40 y mayor.

Resultados: el estudio mostró que las tres subescalas y la adaptación de los 12 ítems de la herramienta fueron de utilidad cuando se aplicaron a la población turca. Las tres subescalsa fueron: " ingesta de alimentos y hábitos dietéticos", "condiciones y dificultades que afectan a la ingestión de alimentos" y "cambios en el peso y restricción alimentaria". Al aplicar los valores de consistencia interna Cronbach alpha se evidenció que los ítems de cada subescala eran consistentes entre sí y constituían un todo.

Conclusión: los hallazgos han demostrado que SCREEN II es una escala confiable y válida para las personas mayores que viven en Turquía.

Correspondence:

Ayşe Ceren Yilmaz. Acibadem University. Faculty of Health Sciences, Nutrition and Dietetics. Kayışdağı Cad. no. 32. Ataşehir, Istambul
e-mail: dytceren@hotmail.com

VALIDITY AND RELIABILITY OF SCREEN II (SENIORS IN THE COMMUNITY: RISK EVALUATION
FOR EATING AND NUTRITION) SEARCH IN TURKISH SOCIETY

313

INTRODUCTION

Aging is an inevitable process that occurs in all living things and cannot be reversed. An adequate and balanced nutrition, medical care facilities, protection from diseases, and improvement of health are important for a quality and long-term life in the old age process (1,2).

Under the influence of aging, many changes occur in the body. Attrition is observed in organs and systems under the influence of aging and chronic diseases. Depending on the factors such as age, genetic structure, environmental factors, nutrition, socio-economic status and quality of life, this wear and the changes that occur may vary from person to person and lead to malnutrition (3-6).

With age, many inadequacies faced with individuals, gastrointestinal, endocrine, immune, genitourinary, urinary tract, central nervous, cardiovascular, skin, respiratory and changes occur in the skeletal system. Until the old age period, the nutritional status and nutrition in old age determine the quality of a person's life. (7,8). Many surveys and scales are used to determine the nutritional status and malnutrition (9). One of the scales used to determine nutritional status and evaluate nutritional risks is the SCREEN II questionnaire. It is a questionnaire that evaluates the risks of eating and nutrition of elderly people in society (10).

As a result, it is aimed to provide a questionnaire that can help determine the risks of nutritional deficiencies and malnutrition to the literature of methods used to determine nutritional status in the elderly together with this study. In this way, it will be a little easier to determine the nutritional risks and the studies conducted on this issue and the results that have been obtained will be more easily compared with studies conducted in other countries.

METHODS

SAMPLE

This study was conducted between January 2018 and September 2018. The sample of the study consisted of individuals aged 50 and over who applied to Ciftehavuzlar Family Health Center No. 4 in Bursa Osmangazi district. There were included 250 participants who did not have dementia, cognitive impairment, communication barrier (not severe hearing, blindness, etc.) and who could answer the questionnaire used in the study were included. However, after the Standardized Mini Mental Test was performed, some individuals were excluded from the study and the study was completed by including 207 participants. Are female 106 of the participants and 101 are male.

Prior to the research, copyright agreement was concluded with Heather Keller (Professor Heather Keller, RD, PhD, University of Guelph, Canada, 1999) and it was stated in the contract that Keller is the copyright and the translation tool will be used for research purposes.

Later, translation studies of the SCREEN II scale were carried out. At the stage of translation of the questionnaire into Turkish, standard translation-reversal method proposed by Brislin et al. (11) was applied. The English original of the questionnaire was translated into Turkish by a total of three specialists who speak English in the field of nutrition: one graduate of English Language Literature, one graduate of American Culture Literature and one graduate of English Translation and Interpreting. As a result of the translations, the articles in the three Turkish questionnaires were compared with each other and the articles with the same translation were determined. Articles with different translations were re-given to the specialist and translated back into English. The final form of the Turkish questionnaire was created by comparing the translated survey items with the original survey items and determining the differences and errors.

The validity and reliability of the Standardized Mini Mental Test (SMMT), consisting of eleven items, was performed for elderly individuals who volunteered for the Turkish society by a psychological consultant trained in scale development, implementation and evaluation. According to the result of the test, which was evaluated on a total of 30 points, the SCREEN II questionnaire was applied to individuals with a SMMT score of more than 20 points by looking at and evaluating whether the elderly had cognitive disabilities using the face-to-face interview technique.

The age of the elderly, gender, educational status, marital status, etc. and, at the same time, anthropometric measurements such as weight and height were recorded by taking sociodemographic information, and body mass index (BMI) values were calculated.

The height of the patient was measured with a height meter and their weight was measured with a weight meter. The height lengths of the individuals who were not dependent on the bed or chair were duly measured with a non-stretching tape measure. During the height measurement, attention was paid to the fact that the feet were adjacent, the knees were straight, the hips and shoulder blades were in contact with the vertical level, and the head was in the Frankfort plane. The body weights of the individuals were duly measured with a 0.1 kg precision digital scale. BMI was calculated by the formula body weight (kg)/length of stature (m^2). The BMI values of individuals were classified based on the BMI classification of the World Health Organization (WHO). Accordingly, BMI was evaluated as follows: < 18.49 kg/m^2 = lean (under weight); 18.50-24.99 kg/m^2 = normal; 25.00-29.99 kg/m^2 = over weight; 30 or higher obesity range. Obesity is frequently subdivided into categories: Grade 1: BMI of 30 to < 35, Grade 2: BMI of 35 to < 40, Grade 3: BMI of 40 or higher. Grade 3 obesity is sometimes categorized as "severe" obesity (12).

DATA COLLECTION TOOLS

The SCREEN II scale used in the study is a 17-item index with two additional weight questions (intention to change the weight in the last six months and perception of current weight). The question of food preparation is a two-stage question. It asks who is preparing the food, and then, the difficulty of preparing the food or the level of satisfaction of the dishes prepared by others. Item scores range from 0 to 4, and the total score is from 0 to 64. The three characteristics of nutritional risk are weight change (increase or decrease), nutrient intake, and risk factors. It is a questionnaire that can be administered by the researcher and does not require anthropometric measurements (13).

Nutritional risk indicators such as weight loss, poor food intake, and risk factors that may cause poor food intake (for example, difficulty in shopping) have been used together to determine whether an individual is at risk. Each item has a maximum of four points, and an increase in the score indicates a decrease in the risk, while a total score of less than 50 indicates a risk (14).

SCREEN II is valid and reliable and has been used to predict mortality and changes in quality of life over time (15).

The SMMT used in the study is used in epidemiological studies to screen for cognitive disorders of individuals living in the community and staying in nursing homes and to follow up on cognitive change in clinical trials. Güngen et al. (16) have confirmed its validity and reliability in the Turkish society. It has been determined that the SMMT is a valid and reliable test that can be applied in Turkish society in the diagnosis of mild dementia, and at the same time the threshold value is 23-24 (17).

ANALYSIS OF RESEARCH DATA

Before deciding on the analyses that should be performed on the collected data, it is necessary to examine how the data are distributed. For this reason, it is discussed how the SCREEN II satisfaction scale scores obtained from the participants are distributed. Table I shows the skewness value, kurtosis value, mode, median and arithmetic mean values of the total scores when examined.

ETHICS COMMITTEE

This research has been approved by the Ethics Committee of the Acibadem University with the decision number 2018-1/125.

SATATISTICAL ANALYSIS

The data obtained in the study were analyzed with the SPSS 24.0 (Statistical Package for Social Sciences) program. Parametric analyses were performed because the kurtosis value was between

-1.5 and +1.5 and the skewness value was between -2 and +2. Question number 15 was not included in the analyses because no score of this question was available. In this study, factor analysis of the main components was used to determine the subscales in which the items were collected. In factor analysis, some variables and substances can be linked to more than one variable. In such a case, October operation called rotation is applied. The purpose of October rotation is to increase the load of a variable or substance on one factor, reduce its load on other factors, and find variables and substances that are close to each factor (18).

For the analysis of the data, t-test was used for unrelated samples for two-category groups and ANOVA analysis was used for groups with more than two categories to compare the averages of independent groups. In addition, exploratory factor analysis was performed to reveal the structure of the scale and to test its validity. Exploratory factor analysis is used to determine the characteristics of variables that are at the basis of a large number of measurements and have a smaller number and determine their number. Exploratory factor analysis is used as a method of extracting factor variables that are common to a large number of measurements. In order to test the reliability of the scale, the internal consistency coefficient Cronbach's alpha was calculated. The results of the analysis were reported at a significance level of 0.05.

RESULTS

FINDINGS ON THE VALIDITY OF THE SCREEN II SCALE

In order to test the construct validity, exploratory factor analysis was performed.

When table I is examined, the skewness, that is, the kurtosis value, is between -1.5 and +1.5, and the kurtosis, that is, the skewness value, is between -2 and +2, showing that the data are normally.

At the beginning of the factor analysis, the Kaiser-Mayer-Olkin (KMO) coefficient value of 0.66, Bartlett's value of 284.716, which was made to test the suitability of the data when starting the

Table I. Descriptive distribution of the data obtained from the participants

	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	I14	I15	I16
Number of participants	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207
Arithmetic mean	2.80	2.92	1.53	1.25	2.77	2.72	1.49	1.27	1.31	3.00	2.80	2.94	0.82	1.63	3.28	2.06
Median	4.00	4.00	.00	1.00	4.00	3.00	2.00	1.00	1.00	3.00	4.00	4.00	.00	2.00	4.00	2.00
Mode	4	4	0	1	4	3	2	1	1	4	4	4	0	2	4	2
Distortion	-0.76	-1.04	0.49	0.82	-0.77	-1.37	-0.73	0.72	-0.02	-0.98	-0.70	-1.05	1.37	0.05	-1.63	0.44
Skewness error kurtosis	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Kurtosis error	-0.97	-0.92	-1.77	0.98	-0.83	2.50	-0.70	-0.78	-0.06	0.25	-1.32	-0.29	.53	-1.06	1.09	-0.72
Arithmetic mean	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

VALIDITY AND RELIABILITY OF SCREEN II (SENIORS IN THE COMMUNITY: RISK EVALUATION
FOR EATING AND NUTRITION) SEARCH IN TURKISH SOCIETY

315

factor analysis (p < .the data presented as 000) indicate that it is in accordance with AFA. There is a widespread opinion in the literature of the field that the minimum magnitude of a substance for a factor load value should be 0.32, from which the cut-off point determined by the act is 0.32. In this study, Varimaks was used from vertical rotation analyses and it was decided that it should be in a three-factor structure with eigenvalues above 1 and the variance it describes is above 10 %.

The line graph used to decide the number of other dimensions is shown in figure 1. A structure explaining 45.35 % of the 12-item variance was obtained by subtracting four items with a factor load value below 0.32 and also boarding. Items 3, 6, 14 and 15 were excluded from the analysis.

In the nomenclature of the three sub-dimensions obtained as a result of the exploratory factor analysis, it was determined that the substances contained in the factor are more related to the food intake of individuals, and this factor was considered under the name of "Food intake and eating habits". The substances
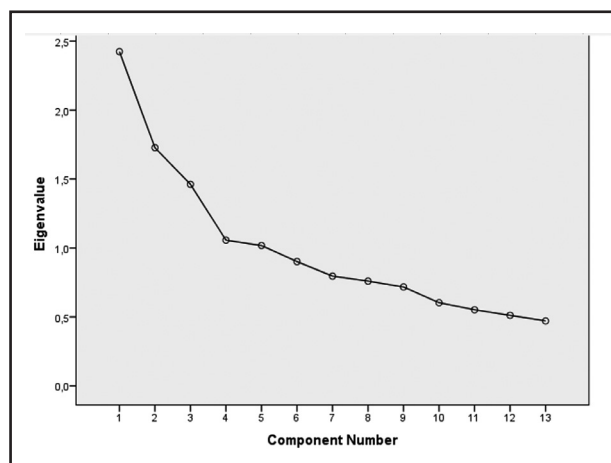
collected under this factor are actively assessing such features as the daily consumption of food groups in their dietary habits. Factor loads of six items collected between 23-24 under the factor of "Food intake and eating habits" vary (17).

Findings on the reliability of the SCREEN II scale

Cronback's alpha values for the dimensions obtained as a result of exploratory factor analysis: were found to be 0.53 for the 1st dimension 0.61, for the 2nd dimension 0.57 for the 3rd dimension and 0.55 for the entire scale.

Multiple correlation coefficients in dimension 1 for all participants ranged from 0.30 (10. item) to 0.384 (4. item). The item subscale correlation coefficients are also the lowest at 0.08 (13. item); the highest is 0.17 (7. item) were found (Table II).

Multiple correlation coefficients in dimension 2 for all participants ranged from 0.31 (16. item) to 0.51 (12. item). Item sub-dimension correlation coefficients were found to be the lowest at 0.11 (16. item); the highest is 0.27 (12. item) were found (Table III).

For all participants, the multiple correlation coefficients in dimension 3 ranged from 0.27 (5. item) to 0.41 (1. item). The item subscale correlation coefficients were also found to be 0.08 (5. item); at the lowest and 0.22 (1. item) at the highest (Table IV). In subscales, nutritional intake and eating habits item's are 4, 7, 8, 9, 10, 13, conditions affecting nutritional intake and difficulties encountered item's are 11, 12, 16 and weight change and nutrient restriction item's are 1, 2, 5.

Of the individuals participating in the study, 106 (51.2 %) were female and 101 (48.8 %) were male. In addition, 47.8 % of the individuals are between 50-60; 34.8 % are between 61-70, and 17.4 % are between 71-80 years of age. Also, 10.1 % of individuals are illiterate, 73.4 % have an elementary school education status, and 16.4 % are high school or older. The marital status of the individuals is married, and 15 % are single (Table V).

Figure 1.

Line graph of the SCREEN II satisfaction scale.

Table II. Analysis of each item for all participants on the "Nutrition intake and eating habits" subscale of SCREEN II

	Arithmetic mean when item is deleted	Variance when item is deleted	Multiple correlation	Item sub-dimension total correlation	Alpha value when item is deleted
Item 4	7.89	9.727	0.385	0.088	0.483
Item 7	7.66	9.343	0.392	0.175	0.437
Item 8	7.87	8.547	0.331	0.120	0.456
Item 9	7.84	10.507	0.384	0.109	0.491
Item 10	6.14	9.888	0.301	0.066	0.522
Item 13	8.32	8.754	0.334	0.080	0.519

Table III. Analysis of each item for all participants regarding the "Conditions affecting nutritional intake and difficulties experienced" subscale of SCREEN II

	Arithmetic mean when item is deleted	Variance when item is deleted	Multiple correlation	Item sub-dimension total correlation	Alpha value when item is deleted
Item 11	5.00	4.704	0.442	0.228	0.482
Item 12	4.86	4.875	0.516	0.270	0.361
Item 16	5.74	6.803	0.319	0.112	0.638

Table IV. Analysis of each item for all participants on the "Weight change and nutritional restriction" subscale of SCREEN II

	Arithmetic mean when item is deleted	Variance when item is deleted	Multiple correlation	Item sub-dimension total correlation	Alpha value when item is deleted
Item 1	5.69	6.506	0.470	0.229	0.326
Item 2	5.57	5.906	0.396	0.195	0.440
Item 5	5.72	7.873	0.279	0.086	0.601

Table V. Sociodemographic and anthropometric characteristics of individuals

		n	%
Age	50-60	99	47.8
	61-70	72	34.8
	71-80	36	17.4
	Total	207	100.0
Gender	Female	106	51.2
	Male	101	48.8
	Total	207	100.0
Educational Status	Not literated	21	10.1
	Primary School	152	73.4
	High School and above	34	16.4
	Total	207	100.0
Marital Status	Married	176	85.0
	Single	31	15.0
	Total	207	100.0
BMI	Under weight	2	1.0
	Normal	31	15.0
	Over weight	71	34.3
	Grade 1 obese	56	27.1
	Grade 2 obese	32	15.5
	Grade 3 obese	15	7.2
	Total	207	100.0

In the t-test for unrelated samples, which was conducted to reveal whether the SCREEN II scale scores of individuals differ significantly according to the gender variable, no difference was observed ($t_{(205)}$ = -1,946, $p > 0.05$) between the mean score of women ($\overline{X}$ = 25.02) and the mean score of men ($\overline{X}$ = 25.88).

As a result of the ANOVA analysis performed to reveal whether the SCREEN II scale scores of individuals differ significantly according to their age levels, there was a significant difference ($F_{(2-204)}$ = 5.536, $p < 0.05$) between the mean score of the participants aged 50-60 ($\overline{X}$ = 26.96), the mean score of the participants aged 61-70 ($\overline{X}$ = 24.18) and the mean score of the participants aged 71-80 ($\overline{X}$ = 23.77).

As a result of the Tukey multiple comparison analysis performed to reveal between which groups the significant difference was, the SCREEN II scale scores of the individuals aged 50-60 were higher than the individuals aged 61-70 and 71-80.

As a result of the ANOVA analysis performed to reveal whether the SCREEN II scale scores of the participants differed significantly according to their BMI status, there was no significant difference ($F_{(5-201)}$ = 1.006, $p > 0.05$) between the mean score of the thin participants ($\overline{X}$ = 25.50), the mean score of the normal weight participants ($\overline{X}$ = 26.58), the mean score of the overweight participants ($\overline{X}$ = 26.069), and the mean score of the grade 1 obese participants ($\overline{X}$ = 25.41), and the mean score of the grade 2 obese participants ($\overline{X}$ = 23.96), and the mean score of the grade 3 obese participants ($\overline{X}$ = 23.26).

For unrelated samples conducted to determine whether the SCREEN II scale scores of individuals significantly according to the gender variable, there was no significant difference between the average score of women ($\overline{X}$ = 25.02) and the average score of men ($\overline{X}$ = 25.88) in the t test ($t_{(205)}$) = -1.946, ($p > 0.05$).

As a result of the ANOVA analysis performed to reveal whether the SCREEN II scale scores of individuals differ significantly according to their age levels, there was a significant difference between the mean score of the participants aged 50-60 ($\overline{X}$ = 26.96), the mean score of the participants aged 61-70 ($\overline{X}$ = 24.18), and the mean score of the participants aged 71-80 ($\overline{X}$ = 23.77). As a result of the Tukey multiple comparison analysis conducted to determine which groups had a significant difference, the SCREEN II scale scores of individuals the age range of 50-60 were higher than those in the age range of 61-70 and 71-80.

As a result of the ANOVA analysis conducted to determine whether the participants' SCREEN II scale scores differed significantly according to their BMI status, there was no significant difference between ($F_{(5-201)}$) = 1.006, $p > 0.05$) the average score of the under weight participants ($\overline{X}$ = 25.50), the average score of the normal weight participants ($\overline{X}$ = 26.58), the average score of the overweight participants ($\overline{X}$ = 26.069), the average score of grade 1 obese participants ($\overline{X}$ = 25.41), the average score of grade 2 obese participants ($\overline{X}$ = 23.96), nd the average of grade 3 obese participants ($\overline{X}$ = 23.26).

DISCUSSION

SCREEN-II was first developed to screen the general nutritional status of elderly living in the community, but later its validity was confirmed as a malnutrition screening tool. Validity has been proven to be good in elderly individuals living in the society of Canada and New Zealand (19), and SCREEN II adaptation studies are available in the Swedish society. In these studies, the sensitivity of the criterion validity ranged from 84 to 90 %, and the specificity from 62 % to 86 %. These are promising results for screening for malnutrition in older adults living in the community.

Living in society, nutritionally at risk older adults (55+ years) to identify a 14 point (+3 sub-questions) self-managed, which is a reliable and valid tool to SCREEN II; weight change, the intention of weight loss, body weight perception, risk factors that may adversely affect food intake and fluid intake and in addition includes questions about food. Use risk identification items that are not available in other screening tools (for example, difficulty shopping and preparing food, etc.) is taken into account. Questioning daily eating habits (daily amounts of milk and dairy product consumption, types and amounts of protein consumed, daily portions of vegetables and fruits eaten, etc.) it contains substances.

The concept of nutritional risk is complicated by the fact that the nutritional status is influenced by a wide range of psychosocial and biological factors, and screening for malnutrition in the elderly is considered to be difficult. The SCREEN II tool is mainly a risk assessment for eating and nutrition. It has been used to predict mortality and changes in quality of life over time.

Screening identifies those at nutritional risk from identified risk factors, such as living alone and lack of appetite, so that a detailed nutritional assessment can be done to measure food and nutrient intake. But the SCREEN II tool is not designed to study high-risk causes; for example, it is not designed to study why older adults do not consume enough fruits, vegetables, and dairy products (20).

This study is aimed to test the validity and reliability of the Turkish version of this scale for elderly people living in society. There are no studies in the Turkish literature regarding the scale. Adapting the scale to Turkish will be useful for other studies and researchers to identify elderly people at risk of nutrition.

It is stated that the item specified by Alpar (21) and Kayis (22) should be greater than 0.25, provided that the total correlation coefficient of the lower dimension is not minus sign. When evaluated in this context, the correlation coefficients obtained were found to be higher than the desired value of 0.25. In addition, if the total correlation value of the obtained item is on the original scale developed by Keller et al., it also shows similarities with the item-whole correlation coefficients (10).

One of the important results of our study is that the difference in BMI values does not constitute a significant difference in total score values. The presence of individuals in the weak, normal weight or obese class did not change the risk of nutritional deficiency. In other words, it can be concluded that obese or normal weight or thin individuals are not a criterion that indicates whether individuals are malnourished or not. A recent US study reported that there is a high prevalence of

nutritional deficiency in overweight and obese people compared to normal-weight individuals. The same study shows that these overweight and obese individuals may consume excessive amounts of dietary energy and do not meet their basic nutritional requirements (23).

CONCLUSION

When the analyses performed in this study were examined, statistically significant results were obtained. As a result, the questionnaire "Assessment of the risk of eating and nutrition of elderly people living in society" is a valid and reliable scale and is suitable for use in Turkish population. Nutritional risk assessments such as SCREEN II and also anthropometric measurements were used in this study.

The importance of this study is that it increases public awareness about malnutrition and provides the basis for changes in nutritional behavior in elderly people. This work also provides opportunities to improve the nutrition of the screened population and can be used to assess its effectiveness in free-living communities. Nutritional deficiencies are common in society, especially in the elderly population, and the first way to prevent this is to analyze correctly and to use the right assessment tools suitable for that society.

While this scale provides ease of application and analysis compared to other scales, it also provides a better assessment of the individual in terms of including specific questions that question the effect of social situations (living alone, etc.) or competencies (being able to do the shopping himself, etc.) on malnutrition.

In addition, this study can be further developed and supported with new studies in terms of reliability and community relevance by applying it to larger populations and making comparisons with other nutritional assessments and screening tools that ask and evaluate questions from different perspectives.

REFERENCES

1. Clegg ME, Williams EA. Optimizing nutrition in older people. Maturitas 2018;112:34-8. DOI: 10.1016/j.maturitas.2018.04.001
2. Kossioni AE. The association of poor oral health parameters with malnutrition in older adults: a review considering the potential implications for cognitive impairment. Nutrients 2018;10(11);1709. DOI: 10.3390/nu10111709
3. Ponikowski P, Voors AA, Anker SD, Bueno H, Cleland JGF, Coats AJS, et al. ESC Guidelines for the Diagnosis and Treatment of Acute and Chronic Heart Failure: the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure of the European Society of Cardiology (ESC) developed with the special contribution of the Heart Failure Association (HFA) of the ESC. Eur Heart J 2016;2016:2129-200. DOI: 10.1093/eurheartj/ehw128
4. Lin H, Zhang H, Lin Z, Li X, Kong X, Sun G, et al. Review of nutritional screening and assessment tools and clinical outcomes in heart failure. Heart Fail Rev 2016;21(5):549-65.
5. Nydahl M, Andersson J, Sidenvall B, Gustafsson K, Fjellstrom C. Food and utrient ıntake in a group of self-managing elderly Swedish women. J Nutr Health Aging 2003;7:67-73.
6. Yoshihisa A, Kanno Y, Watanabe S, Yokokawa T, Abe S, Miyata M, et al. Impact of nutritional indices on mortality in patients with heart failure. Open Heart 2018;5(1):e000730. DOI: 10.1136/openhrt-2017-000730
7. Tails CR, Fillit MH. Geriatric medicine and gerontology. 6th ed. Churchill Livingstone; 2003.
8. Furuta M, Komiya-Nonaka M, Akifusa S, Shimazaki Y, Adachi M, Kinoshita T, et al. Interrelationship of oral health status, swallowing function, nutritional status, and cognitive ability with activities of daily living in Japanese elderly people receiving home care services due to physical disabilities. Community Dent Oral Epidemiol 2013;41(2):173-81. DOI: 10.1111/cdoe.12000
9. Davidovic M, Sevo G, Svorcan P, Milosevic DP, Despotovic N, Erceg P. Old age as a privilge of the "selfish ones". Aging Dis 2010;1:139-46.
10. Keller HH, Hedley MR, Wong SSL, Vanderkooy P, Tindale J, Norris J. Community organized food and nutrition education: participation, attitudes, and nutritional risk in seniors. J Nutr Health Aging 2006;10(1):15-20.
11. Brisslin RW. The wording and translation of research instruments. In: Lanner WJ, Berry JW (eds.). Field Methods in Educational Researc. Newburry Park, CA: Sage; 1986. pp. 137-64.
12. Poobalan AS, Aucott LS, Gurung T, Smith WCS, Battacharya SI. Obesity as an independent risk factor for elective and emergency caesarean delivery in nulliparous women - Systematic review and meta-analysis of cohort studies. Obes Rev 2009;10(1):28-35. DOI: 10.1111/j.1467-789X.2008.00537.x
13. World Health Organization (WHO). Global database on BMI. Accessed: 6th of July, 2022. Available from: https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/body-mass-index
14. Keller HH, McKenzie JD, Goy RE. Construct validation and test-restest reliability of the Seniors in the Community: Risk Evaluation for Eating and Nutrition Questionnaire. J Gerontol A Biol Sci Med Sci 2001;56A(9);552-8. DOI: 10.1093/gerona/56.9.M552
15. Keller HH, Hedley MR, Wong Brownlee S. Development of SCREEN – Seniors in the Community: Risk Evaluation for Eating and Nutrition. Can J Diet Pract Res 2000;61(2):67-72.
16. Güngen C, Ertan T, Eker E, Yasar R, Engin F. Validity and reliability of the standardized Mini-Mental Test in the diagnosis of mild dementia in Turkish population. Turk J Psychiatry 2022;13(4):273-81
17. Crum RM. Population-based norms for the Mini-Mental State Examination by age and educational level. JAMA 1993;269(18):2386. DOI: 10.1001/jama.1993.03500180078038
18. Hovardaoğlu S. Research Techniques for Behavioral Sciences. Ankara: VE-GA Publications; 2003; p. 24.
19. Wham CA, Redwood KM, Kerse N. Validation of the nutrition screening tool "Seniors in the community: risk evaluation for eating and nutrition, version II" among octogenarians. J Nutr Health Aging 2014;18(1):39-43. DOI: 10.1007/s12603-013-0361-8
20. Keller HH, Østbye T, Goy R. Nutritional risk predicts quality of life in elderly community-living Canadians. J Gerontol A Biol Sci Med Sci 2004;59:68-74.
21. Alpar R. Applied Statistics in Sport Sciences. TR. Prime Ministry General Directorate of Youth and Sports. 2022: Detay Publishing, Ankara. 300-325
22. Kayis A, Kalayci S (eds.). SPSS Applied Multivariate Statistical Techniques. 2006. pp. 404-19.
23. Kimmons JE, Blanck HM, Tohill BC, Zhang J, Khan LK. Associations between body mass index and the prevalence of low micronutrient levels among US adults. MedGenMed 2006;8(4):59-60.