Evaluation of validity-reliability of Turkish version of the household food security survey short form

Hane halkı besine ulaşılabilirlik ölçeğinin Türkçe geçerlilik ve güvenilirliğinin değerlendirilmesi

Turkish version of the household food security survey

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Öz

Amaç: Çalışmada, Hane Halkı Besine Ulaşılabilirlik Ölçeği-Kısa Formu'nun Türkçe sürümünün kültürel uyumu ile birlikte geçerlilik ve güvenilirlik çalışmasını yapmak ve Mevsimlik Tarım İşçileri'nin besine ulaşabilme sorununun boyutunu yerle halkla karşılaştırmak amaçlandı. Gereç ve Yöntem: Çalışma, 2012 yılı tarım mevsiminde yürütülen metodolojik bir araştırmadır. Çalışma grubu, Eskişehir ili Mevsimlik Tarım İşçileri'nden ve onların yaşadığı kamp bölgelerine en yakın kırsal bölgedeki yerleşik halktan oluştu. Kullanılan anket formunun birinci bölümü hane katılımcısının sosyo-demografik özelliklerini, ikinci bölüm ise Hane Halkı Besine Ulaşılabilirlik Ölçeği-Kısa Formu'nu içermekteydi. Çalışmada yapı geçerliliği için açımlayıcı faktör analizi, iç ölçüt geçerliliği için Mevsimlik Tarım İşçileri ile yerel halk karşılaştırıldı. Güvenilirlik analizleri için madde toplam korelasyon ve Cronbach alpha katsayıları hesaplandı. Bulgular: Açımlayıcı faktör analizi sonuçlarına göre maddeler tek faktör altında toplanmakta olup, varyansın %68.38'ini açıklamaktadır. Maddelerin faktör yükleri 0.82 ila 0.90 arasında değişmekteydi. Toplam puanın %27'lik alt ve üst gruplar arasında fark anlamlı olup (p<0.001), Mevsimlik Tarım İşçileri'nin aldıkları puan yerel halkın puanından daha yüksekti (p<0.001). Ölçekte yer alan maddelerin madde-toplam korelasyon katsayılarının 0.65 ile 0.84 arasında değişmekte olup içtutarlılık katsayısı 0.904 idi. Mevsimlik Tarım İşçileri'nin hanelerinden %90.4'ü besine ulaşmada riskli iken yerleşik olarak yaşayan hanelerin %36.6'sının besine ulaşmada riskli olduğu saptandı (p<0.001). Tartışma: Hane Halkı Besine Ulaşılabilirlik Ölçeği-Kısa Formu'nun Türkçe uyarlaması Türk toplumunda uygulanabilir, besine ulaşmayı değerlendiren geçerli ve güvenilir bir ölçektir. Mevsimlik Tarım İşçileri'nde besine ulaşılabilirlik önemli bir sorundur.

Anahtar Kelimeler

Hane Halkı Besine Ulaşılabilirlik Ölçeği-Kısa Formu; Mevsimlik Tarım İşçileri; Geçerlilik

Abstract

Aim: This study aimed to assess the validity and reliability of the Turkish version of the Household Food Security Survey Module-Short Form Scale with cultural adaptation and to compare the size of the problem of food accessibility of seasonal farmworkers with locals. Material and Method: This study is a methodological research executed in the 2012 agricultural season. The study group was composed of seasonal farmworkers in Eskisehir and residents located in rural areas next to the camp sites of seasonal farmworkers. The first part of the survey included socio-demographic characteristics of the household and the second part contained the Short Form of Household Food Security Survey Module. Exploratory factor analysis was conducted for construct validity and for internal criterion validity scores of seasonal farmworkers and locals. For reliability analysis, item total correlation and Cronbach alpha coefficients were measured. Results: Results of exploratory factor analysis indicated that the items are collected under one factor and explain 68.38% of the variance. Factor loadings of the items varied between 0.82 and 0.90. The difference between the upper and lower groups was significant (p <0.001), and the score of seasonal farmworkers was higher than that of the local population (p <0.001). The internal consistency coefficient was 0.904. It was found that 90.4% of the households of seasonal farmworkers were at risk of accessing food, while 36.6% of the local residents were at risk of accessing food (p <0.001). Discussion: The Turkish version of the Household Food Security Survey Module-Short Form is a valid and reliable measure evaluating nutritional access that can be applied in Turkish society. Food accessibility of seasonal farmworkers is a critical problem.

Keywords

Household Food Security Survey Module-Short Form; Seasonal Agricultural Labors; Validity

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Introduction

Food accessibility is defined as "convenient, accessible, and affordable food for all people at all times" [1]. Food safety is defined as accessibility of people to safe, adequate, and nutritious food meeting nutritional requirements and food choices in order for people to live active and healthy lives, and containing three key elements related to availability [2,3]. Food accessibility, one of the basic elements of food safety, is a critical human problem and its consequence is also an important public health problem.

A report issued by the United States (US) Department of Agriculture found that 11.1% of households had risk of accessing food. It was reported that in communities known as being at risk, such as those of agricultural laborers, the risk of accessing food is seven times higher than that of the normal population [4]. The Global Food Insecurity report published by the World Health Organization (WHO), World Food Program, and the International Agricultural Development Fund reported that 870 million people (12.5% of the world population and 14.9% of the population in developing countries) were undernourished and could not reach the energy needed [5]. Nutritional deficiencies and microelement deficiencies contribute significantly to the global disease burden. In addition to the increased incidence and severity of infectious diseases, deficiencies also play roles in increasing chronic diseases, such as food insufficiency, obesity, diabetes, and cardiovascular diseases. Consequently, they increase the economic burden on the health system [6].

Many organizations and countries are striving to augment food accessibility and prevent hunger. In order for these efforts to be successful, there is a need to identify the groups experiencing food accessibility and hunger problems. Seasonal Farmworkers (SFW) ranks first in Turkey among risk groups with food accessibility and hunger problems. SFW have food accessibility problems because of difficult working and living conditions.

A low cost easy-to-use measurement instrument to evaluate food accessibility can be a guide for governments and organizations by demonstrating both where and how much of a risk exists [7]. In this context, the U.S. Household Food Security Survey Module (HFSSM) developed in the US in 1995 with 18 items, contains metrics for the availability of food to households [8]. In 1999, Blumberg et al. developed a shorter and faster-to-administer form by selecting 6 items from these 18 items [9]. The Household Food Security Survey Module- Short Form (HFSSM-SF) assesses food security according to whether it is accompanied by hunger or not.

In this study, since there is not yet a Turkish version of HFSSM-SF, we primarily aimed to implement validity and reliability research with cultural adapation and to evaluate the size of the problem of SFW food security compared with that of local residents.

Material and Method

Study Group

This study is a methodological research applied in the 2012 agricultural season that aimed to implement validity and reliability analysis of the HFSSM-SF in Turkey. In order to implement the study, approval of the ethics commitee was obtained. Verbal approvals of the participants were obtained. In addition, necessary permissions were received from Provincial Public Health Directorate, local administrative and health managers, and informal managers of the SFW campground.

This study was executed with SFW settled in the rural region of Eskişehir (located in the Central Anatolian Region of Turkey) and local residents living in rural areas close to the camping zones. SFW were camping and settling next to their working areas. Tents were built on the ground and most were covered with nylon or tarpaulins. Only 19% of the tents had electricity accessibility. Many tents had no space for a kitchen, bedroom, toilet, or bathroom. There was no water supply in the tents and drinking water needed to be carried from a common tusk to the tents. People living in tents were facing many health problems due to their living conditions.

In line with the purpose of the study, since there were no records of SFW, 52 households from the largest camp site and 186 households from the nearest settlement half-rural area (Alpu), totaling 238 households, were randomly selected and included in the research. Field work of the study was conducted by a research team and intern doctors. All the researchers took theoretical training before the field study began. Each tent in the camp site was considered a household and they were visited by researchers one by one. When the head of the household was not in the tent, a person aged 18 or over was considered as householder. After explaining the purpose of the study, the questionnaire form was applied by the researchers using a face-to-face interview technique. SFW who did not know Turkish were interviewed via people they selected who knew Turkish. Sampled participants from the Alpu district center were also visited in their houses and the same questionnaire form was applied through the face-to-face interview technique by the same research group.

Data Collection Tools

The questionnaire used in the survey contained two parts. The first part included socio-demographic characteristics of the participants and the second part embodied HFSSM-SF. HFSSM-SF consisted of 6 items questioning sufficiency of food intake in the previous 12 months, attainment of balanced meals, and occurrence of skipping meals despite being hungry because of economic deficiency [9]. Participants were asked to answer the questions from the options: 'Often True', 'Sometimes True', 'Never True', 'Do not know' or 'Refused' for items 1, 2 and 4 and 'Yes', 'No' or ' I don't know' for items 3, 5, and 6. If the participant marked 'Often True' for the items 1, 2 , 4 and 'Yes' for the items '3, 5, and 6', it was scored 1 point and for other options it was scored '0'. The score from the scale ranged from 0 to 6. If the score was '0' it was interpreted as 'high food security'; if the score was '1', it was interpreted as 'marginal food security (there was a risk for accessibility to food)'; if the score was '2-4' it was interpreted as 'low food security (no access to food, but this situation was not accompanied by hunger)'; and if the score was '5-6' it was interpreted as 'very low food security (food was not attainable and this was accompanied by moderate hunger)'. Interpretations of the scores collected from the HFSSM-SF are in Table 1.

Table 1. Meaning of the scores taken from HHFSSM-SF

HHBUÖ-KF Score	Meaning
0 point	High food security
1 point	Marginal food security (there is risk to access food)
2-4 point	Low food security (not accessing food but not accompanied by hunger)
5-6 point	Very low food security (not attaining food and accompanied by moderate hunger)

Validity Analysis

In order to provide the language validity of the scale, first the scale items were translated from English to Turkish, and later by different people they were translated from Turkish to English again. In addition, linguistic and cultural adaptation was ensured to avoid changes in meaning. In terms of scope validity, expert opinions were received from seven people and the suggestions were incorporated into the revised form. Later, the scale items were pre-tested with 15 people and all items appeared to be clear and understandable.

In order to test construct concept validity, Exploratory Factor Analysis (EFA) was implemented. In order to test the internal criterion validity, by structuring the hypothesis that HFSSM-SF scores of agricultural labors were higher than the resident locals, scores obtained from the scale were compared. Moreover, the scores were ranked and observed as to whether there was a difference between the medians of the highest three-tier slice and the lowest three-tier slice.

Reliability Analysis

For reliability analysis of HFSSM-SF descriptive statistics of the items and for total correlation coefficient, Pearson Moments Multiples were determined. Items with correlation coefficients higher than 0.20 were considered reliable. Cronbach alpha coefficient was calculated in order to determine the internal consistency.

Evaluation of data

Data collected from the scale was evaluated via IBM SPSS (version 20) package programme. Descriptive statistics were utilized for demographic characteristics of the study group. Suitability of the scores taken from HFSSM-SF to normal distribution was observed via Shapiro-Wilk Test. Non-parametric tests were used because of the absence of normal dispersion. In the comparison of the two groups, Mann Whitney U was used for the quantitative data and Chi-square analysis was used for the qualitative data.

Results

The study was executed with 238 households composed of 56 SFW and 186 locals. In the SFW group, the average age of the people that provided information was higher than in the local group. In addition, the average number of people and children per household was higher in the SFW group. The general characteristics of participant households are provided in Table 2.

Validity Analysis Results of HFSSM-SF

The construct validity of the HFSSM-SF was examined by EFA method. Kaiser-Meyer-Olkin (KMO) coefficient was 0.837 and

Table 2. General Characteristics of participant Households

Properties	SFW n=52	Local residents n=186	Statistical Analysis p
Age of the person received information) Avarage (SD)	37.9 (10.4)	33.3 (6.2)	< 0.001
Average number of people in the house Median (min-max)	8.1 (2.0-18.0)	4.5 (3.0-9.0)	< 0.001
Number of children Median (min-max)	6.0 (1.0-13.0)	2.0 (1.6-6.0)	< 0.001

Barlett's Test was observed to be significant (X2 =1201.73, p<0.001). The KMO coefficient and Barlett'sTest indicated that the data and sample size was appropriate for the selected analysis. When the structure of the scale was examined using the EFA method, only 1 factor was identified with an eigenvalue higher than 1. The eigenvalue of this factor was 3.69 and accounted for 68.38% of the variance. Factor loads ranged from 0.75 to 0.90. Factor loads are shown in Table 3.

Table 3. Factor loads of HHFSSM-SF, item total correlations and Cronbach alpha coefficients when the item is removed

HHFSSM-SF	Factor Loads	Item total Correlation	Scale Cronbach Alpha Values when the item is removed
Insufficiency of nutrition intaken	0.90	0.77	0.88
Not accessing balanced meal	0.87	0.65	0.90
Reducing size of the meal because of economic inadequacy	0.84	0.84	0.87
Frequency of reducing size of meal because of economic inadequacy	0.82	0.79	0.88
Eating less because of economic inadequacy)	0.78	0.73	0.88
Could not eat even he/she is hungry because of economic inadequacy	0.75	0.68	0.89
Explained variances: %68.38()	Cronbach alfa:0.904		

In order to assess the internal criterion validity of the scale, scores of households from scale items were ranged from low to high. The distribution was found to be significant (z = 11.476, p <0.001), with 27% subgroup median (min-max) value 0 (0-0) and 27% upper group mean value 5 (2-6).

The hypothesis that HFSSM-SF scores of SFW would be found to be higher than the scores of the resident households was refuted. While the median (min-max) value of SFW from the scale was 5 (0-6), the median value of the locals was determined to be 0 (0-6). HFSSM-SF scores of SFW were found to be higher than local residents (z=9.081, p<0.001).

Reliability Analysis Results of HFSSM-SF

One of the reliability indicators was corrected item-total correlation coefficient. According to existing results, item-total correlation coefficient of the items in the scale varied between 0.65 and 0.84. For a valid and reliable scale, the lower limit of alpha coefficient was considered to be 0.70 [10]. When any of the items in the scale were excluded, it was determined that the Cronbach alpha coefficient did not change significantly.

The Cronbach's alpha coefficient of HFSSM-SF, consisting of six items, was 0.904; in the SFW group it was 0.883 and in the local residents group it was 0.849. Results of reliability analysis of HFSSM-SF are reported in Table 3.

Comparison of Scale Results in the Study Groups

The distribution of the responses of the study groups to HFSSM-SF items is indicated in Table 4.

While 90.4% of SFW were at risk of access to food, 36.6% of the local residents were found to be at risk of accessing food (p <0.001).

Table 4. Distribution of answers that study groups gave to HHFSSM-SF items

HHBUÖ-KF	SFW n (%)	Local residents (%)	Statistical Analysis p
Insuficiency of nutrition intaken	39 (75.0)	39 (21.0)	<0.001
Not accessing balanced meal	44 (84.6)	47 (25.3)	<0.001
Reducing size of the meal because of economic inadequacy	33 (63.5)	29(15.6)	<0.001
Frequency of reducing size of meal because of economic inadequacy	30 (57.7)	18 (9.7)	<0.001
Eating less because of economic inadequacy	35 (67.3)	37 (19.9)	<0.001
Could not eat even he/she is hungry because of economic inadequacy	26 (50.0)	16 (8.6)	<0.001

Discussion

Although food insecurity is widespread in developing countries, who these people are and to what extent they are affected is unclear. In order to determine the frequency and extent of food insecurity, reliable and valid measurement tools are required. After a comprehensive literature review it was observed that there was no scale utilized in community-based studies in Turkey; therefore we aimed to undertake reliablity and validity studies of the HFSSM-SF.

In the validity analysis of EFA, a one-dimensional structure was established and total variance of the one-dimensional structure was revealed to be 68.38%. It is advantageous that the variance is above 50%. The higher the variance, the better the measurement can be made. Explanation of 30% of total variance in scale adaptation studies and factor loads of scale items of at least 0.40 were reported to be an adequate value [11]. Findings suggests that the Turkish version of the HFSSM-SF is similar to the structure of the original scale.

The scores obtained for criterion validity are intended to distinguish the measured feature with its characteristics whether to possess the feature demanded or not [12]. For criterion validity, the study was evaluated in two different ways with the internal criterion. First, the difference between the lower and upper group point averages were observed to be significant (p <0.001). Therefore, the Turkish version of HFSSM-SF was demonstrated to be capable of distinguishing between those who have the studied feature and those who do not.

Corrected item total correlation coefficient was calculated to determine contribution of items to conceptual structure of the scale and to identify whether the scale measures the desired feature. Items having corrected item total score correlation greater than 0.40 are considered highly distinctive, coefficients between 0.21 and 0.40 are considered to be distinctive at the moderate/acceptable level, and coefficients lower than 0.20 are identified as low level distinctive [13]. Correlation coefficient of every item in the scale was higher than 0.65 and the items all had good levels of distinctiveness.

At a reliable scale, the Cronbach alpha value is required to be at least 0.70 [10]. In this study, the Cronbach alpha coefficient varied between 0.87-0.90 among the study groups and it was 0.90 in the whole group. When any of the items in the scale were removed, it was observed that the Cronbach alpha coefficient did not increase significantly.

When the responses of the study groups to the items of the HFSSM-SF were evaluated, it was observed that SFW were receiving insufficient food compared with local residents, they were unable to access a balanced meal, and they reduced the size of their meal because of economic inadequacy. One of the most dramatic results of the study is that half of the SFW could not eat when they were hungry because of their economic inadequacies. When these results were evaluated, it was determined that the SFW were at risk for access to food compared with the local people and, as a terrifying consequence of this, they were hungry. Studies conducted in the US also asserted that SFW were found to be riskier in terms of nutrient availability than local populations in line with the results of the present study [14,15]. There are many studies in the literature reporting that SFW are risky groups in terms of nutritional accessibility and that they are starving to various degrees [16-18].

This study has similar results with other studies in the literature. SFW were observed to be a risky group in terms of nutritional accessibility in our country similar to the world population. Especially, this group's level of hunger indicates the seriousness of the problem. Therefore more comprehensive solutions need to be implemented rather than local solutions in order for this problem to be solved.

This is the first study of the validity and reliability of the HFSSM-SF in Turkey. A new scale to assess household accessibility, particularly in disadvantaged groups, has been added to the literature. Communication difficulties caused by language problems of SFW and the impossibility of performing test-retest for the reliability of the scale due to working hours are significant limitations.

Consequently, in light of the analysis conducted, the Turkish version of the HFSSM-SF is a valid, reliable, and applicable scale evaluating food security in society. Moreover, using this scale demostrated that food accessibility of SFW is extremely inadequate. In addition, urgent solutions at a national level are needed to address this problem. Furthermore, by using this scale, research conducted with different large groups will be beneficial and the results of these studies will contribute to scale development.

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Competing interests

The authors declare that they have no competing interests.

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