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Reliability and Validity of the Turkish Version of the Nine-Item Avoidant/Restrictive Food Intake Disorder Screen (NIAS) Parent-Report

Dokuz Maddeli Kaçıngan/Kısıtlayıcı Gıda Alım Bozukluğu Tarama Ölçeği (NIAS) Ebeveyn Bildirimi'nin Türkçe Versiyonunun Geçerlik ve Güvenirliği

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ABSTRACT

Objective: The current study aimed to evaluate the psychometric properties of a Turkish version of The Nine Item Avoidant/Restrictive Food Intake Disorder Screen Parent Report (NIAS-PR), which measures the avoidant/restrictive food intake disorder (ARFID) symptoms by parents. NIAS-PR includes three subscales picky eating, poor appetite/limited interest in eating, and fear of aversive consequences from eating. Also, our secondary aim was to assess the relationship between ARFID-related eating behaviours and emotional-behavioural symptoms of children and parents' psychological status.

Material and Methods: The NIAS-PR was translated into Turkish with standard procedures. Two hundred sixty-eight children (133 girls, 49.6%; mean age 8.62, age range from 2 to 18 years) and parents (175 mothers, 65.2%) were included in the study. The factor structure was confirmed using confirmatory factor analysis (CFA). The results were compared to the validated Turkish Children's Eating Behavior Questionnaire (CEBQ) to determine the convergent validity. Internal consistency (Cronbach alpha coefficient) analysis was used to determine the reliability of the NIAS-PR.

Results: The current study provided evidence for the validity of the translated Turkish version of the NIAS-PR in the pediatric population. The three-factor structure of the NIAS—Picky eating, Appetite, and Fear—was replicated in the Turkish NIAS-PR. The NIAS-PR subscales showed the expected patterns of correlations with the CEBQ subscales. The reliability of the Turkish version of NIAS-PR proved to be satisfactory (total Cronbach's alpha=0.90) in the pediatric population (2-18 years).

Conclusion: This study demonstrated a good internal consistency of the Turkish version of the NIAS-PR. We confirmed the three-factor structure of the Turkish version of NIAS-PR. NIAS-PR is a brief, reliable instrument for ARFID research in Turkish children and adolescents. The NIAS-PR is developed as a screening questionnaire, so health professionals should use it to investigate ARFID-related eating behaviours further. It is worth mentioning that deepening these eating symptoms with clinical interviews is necessary.

Key Words: ARFID, Avoidant/restrictive food intake disorder, NIAS, Reliability, Validation

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ÖZ

Amaç: Bu çalışma, ebeveynler tarafından kaçınan/kısıtlayıcı gıda alım bozukluğu (KKGAB) semptomlarını ölçen Dokuz Maddeli Kaçınan/Kısıtlayıcı Gıda Alım Bozukluğu Tarama Ölçeği'nin (NIAS-EÖ) Türkçe versiyonunun psikometrik özelliklerini değerlendirmeyi amaçlamıştır. NIAS-EÖ, seçici yeme, iştahsızlık/yemeye karşı sınırlı ilgi ve yemek yemenin tiksindirici sonuçlarından korkma olmak üzere üç alt ölçeğe sahiptir. Araştırmanın ikincil amacı ise, KKGAB ile ilişkili yeme davranışları ile çocukların duygusal-davranışsal belirtileri ve ebeveynlerin psikolojik durumları arasındaki ilişkiyi değerlendirmektir.

Gereç ve Yöntemler: NIAS-EÖ standart prosedürlerle Türkçe'ye çevrilmiştir. Çalışmaya 268 çocuk (133 kız, %49.6; ort. yaş 8.62, yaş aralığı 2-18) ve ebeveynleri (175 anne, %65.2) dahil edilmiştir. Faktör yapısı, doğrulayıcı faktör analizi (DFA) kullanılarak doğrulanmıştır. Sonuçlar, yakınsak geçerliliği belirlemek için geçerli bir ölçek olan Türk Çocuklarının Yeme Davranışı Anketi (ÇYDA) alt testleri ile korelasyon analizleri yapılmıştır. NIAS-PR'nin güvenilirliğini belirlemek için iç tutarlılık (Cronbach alfa katsayısı) analizi kullanılmıştır.

Bulgular: Mevcut çalışma, NIAS-EÖ'nin çevrilmiş Türkçe versiyonunun pediatrik popülasyonda geçerli bir ölçek olduğunu göstermiştir. NIAS'ın üç faktörlü yapısı -Seçici yeme, İştah ve Korku- Türkçe versiyonu NIAS-EÖ için tekrarlanmıştır. NIAS-EÖ alt ölçekleri, CEBQ alt ölçekleri ile beklenen korelasyon modellerini göstermiştir. Pediyatrik popülasyonda (2-18 yaş) NIAS-EÖ Türkçe versiyonunun güvenilirliğinin yüksek olduğu (toplam Cronbach alfa=0.90) saptanmıştır.

Sonuç: Bu çalışma, NIAS-EÖ'nin Türkçe versiyonunun iyi bir iç tutarlılığı olduğunu göstermiştir. NIAS-EÖ'nin Türkçe versiyonunun üç faktörlü yapısı doğrulanmıştır. NIAS-EÖ, Türk çocuk ve ergenlerinde ARFID araştırması için kısa, güvenilir bir araçtır. NIAS-EÖ bir tarama ölçeği olarak geliştirilmiştir, bu nedenle sağlık profesyonelleri bu ölçeği KKGAB ile ilgili yeme davranışlarını daha fazla araştırmak için kullanabilir. Bu kısıtlı/kaçıngan yeme semptomlarının klinik görüşmeler ile derinleştirilmesi gerektiğini belirtmekte fayda vardır.

Anahtar Sözcükler: ARFID, Kaçıngan/kısıtlı yeme bozukluğu, NIAS, Güvenirlik, Geçerlilik

INTRODUCTION

Avoidant/restrictive food intake disorder (ARFID) is an eating/feeding disorder characterised by avoidant/ restrictive eating behaviours. The underlying causes of ARFID are heterogeneous, and it shows three main presentations; selective/neophobic, eating lack of interest in eating, and fear of the aversive consequences of eating, such as vomiting or choking (1). ARFID is a new disorder in DSM-5, an extension of the DSM-IV feeding disorder of early infancy and childhood (2). It can be diagnosed in individuals of any age that is associated with one or more of the following Criterion A symptoms in DSM-5: Significant weight loss (or failure to achieve expected weight gain or faltering growth in children), significant nutritional deficiency, needs for enteral feeding or oral nutritional supplements, impaired psychosocial functioning. These symptoms do not occur during anorexia nervosa or bulimia nervosa, and there is no disturbance related to one's body weight or shape. Additionally, the eating disturbance is not attributable to a concurrent medical condition or not better explained by another mental disorder for ARFID diagnosis (1).

ARFID is common in the community and pediatric clinical samples (3-6). Eating restrictions can occur in only one domain or multiple domains (e.g., both selective eating, appetite, or fear), so they can usually show different presentations (7). Research on ARFID provides important growing data, but more is needed to understand its presentations and prevalence in pediatric populations. In Turkey, there is no measure of ARFID symptoms, neither a self-report nor a parent report. Thus, we aimed to translate the Nine Items Avoidant/Restrictive Food Intake Disorder Screen Parents Report (NIAS-PR) into Turkish and conduct a validity and reliability study of the Turkish version of NIAS-PR. Also, we purposed to assess the relationship between ARFID-related eating behaviours and emotional-behavioural symptoms of children and parents' psychological status.

MATERIALS and METHODS

Participants and Procedure

All parents of children aged 2-18 who were admitted to the General Pediatric Outpatient Clinic in our hospital were invited to the study. The data was collected between June-August 2022. The study did not include children with caregivers other than their mother or father. Parents whose capacities were insufficient to understand and fill in the questionnaires were not included in the study. Parents who agreed to participate were included in the study. Informed consent was obtained from all participants. Approval for the Ankara City Hospital Ethics Committee (08.06.2022/E2-22-1962).

Firstly, demographic characteristics were collected of the child and the family (child's age, gender of the child, presence of psychiatric history admission of child, height and weight of the child, body mass index (BMI) of child, parents' educational levels, feeding history of the child). Children's BMIs (kg/m2) and BMI percentiles were calculated using the gender- and age-dependent Turkish child reference curves. The parent report determined eating problems with yes or no questions: "Do you think your child has eating problems?" Secondly, parents were asked to fill out the Turkish version of the NIAS parent form, Children's Eating Behavior Questionnaire (CEBQ), and Strengths and Difficulties Questionnaire-Parents Form (SDQ) for the children's eating behaviours and emotional and behavioural problems. Additionally, parental psychological status was assessed by Depression Anxiety and Stress Scale (DASS-21).

Measures

The Nine-Item ARFID Screen (NIAS) Parent-Report

The NIAS-PR is a 9-item parent-report questionnaire that assesses avoidant/ restrictive eating patterns. The NIAS is comprised of three subscales: the picky eating subscale measures sensory aversion to food (e.g., "My child is a picky eater"), the appetite subscale measures a lack of interest in eating or food (e.g., "My child does not appear very interested in eating; s/he has a smaller appetite than other kids the same age"), and the fear subscale measures fear of aversive consequences as a consequence of eating (e.g., "My child does not eat enough food because s/he is afraid of discomfort, choking, or vomiting"). Parents respond to each question on a scale from 0 (Strongly Disagree) to 5 (Strongly Agree). Subscales are each scored on a scale from 0 to 15, with higher scores indicating higher levels of each metric (picky eating, lack of interest, and fear). All items may also be summed to calculate a total score, ranging from 0 to 45, with higher scores indicating higher levels of avoidant/restrictive eating broadly (8). Cronbach alphas of the NIAS-PR in the Polish sample were .84, .88, and .99 for the picky eating, lack of interest, and fear subscales, respectively (9).

Written permission was obtained from H. Zickgraf, who developed the questionnaire, to translate and conduct validity and reliability studies of the NIAS parent form in Turkish children. Two authors first translated the NIAS parent form from English to Turkish, resulting in a single version after the consensus meeting. Then an independent native speaker back-translated the scale into English. After a pilot study with ten patients, minor adaptations were made for cultural suitability, and the final Turkish version of the NIAS parent form was obtained. English and Turkish versions of NIAS-PR are presented in Table I.

Children's Eating Behavior Questionnaire (CEBQ)

The CEBQ was developed by Wardle et al.(10) and translated and adapted into Turkish (11). It includes questions to be answered by the parents that evaluate the children's eating behaviour habits. The Cronbach alpha value of the adapted Turkish version of the study was .69 (11). The CEBQ is a Likert-type questionnaire answered by the parents and includes 35 items, each assessed on a scale of five points (1 = never, 5 = always). Eight subdimensions were determined to measure child eating behaviour from the scale as follows: Food responsiveness (FR), Emotional overeating (EOE), Enjoyment of food (EF), Desire to drink (DD), Satiety responsiveness (SR), Slowness in eating (SE), Emotional undereating (EUA) and Food fussiness (FF).

Strengths and Difficulties Questionnaire-Parents Form (SDQ)

The SDQ was developed by Robert Goodman to evaluate the emotional and behavioural problems in children and adolescents.(12) The SDQ has been adapted to the Turkish language (13). There are two Turkish forms of SDQ parent for the 2-4 age and the 4-17 age period. We used two versions of the Turkish SDQ parent form in our study. Both versions of the SDQ parent form have 25 items that question positive and negative behaviour characteristics. They contain five subscales: hyperactivity–inattention, emotional symptoms, peer problems, conduct problems, and prosocial behaviour. Each subscale consists of five items, and the sum of the first four subscales produces a total difficulties score. A higher score indicates

Table I: NIAS-PR: English and Turkish versions.

	English Version of the NIAS-PR	Turkish Version of the NIAS-PR
1	My child is a picky eater	Çocuğum yemek seçen biridir.
2	My child doesn't like many of the foods that other kids his or her age eat easily	Çocuğum, yaşıtı diğer çocukların kolayca yediği çoğu yiyeceği sevmez.
3	My child refuses to eat everything but a short list of preferred foods	Çocuğum, tercih ettiği yemeklerin olduğu kısa bir liste dışındaki her şeyi yemeyi reddeder.
4	My child does not appear very interested in eating; s/he has a smaller appetite than other kids the same age	Çocuğum yemek yemeye pek ilgili görünmüyor; aynı yaştaki diğer çocuklara göre daha az iştahlıdır.
5	Left to his/her own devices, my child would not eat a large enough volume of food	Kendi haline bırakıldığında, çocuğum yeterince fazla miktarda yemek yemez.
6	It is difficult to get my child to eat a large enough volume, even when I offer foods that s/he really likes	Çocuğuma gerçekten sevdiği yiyecekleri sunduğumda bile yeterince fazla miktarda yemesini sağlamak zordur.
7	My child refuses to eat because s/he is afraid of discomfort, choking, or vomiting	Çocuğum yemek yemeyi reddeder çünkü rahatsızlık hissinden, boğulmaktan veya kusmaktan korkar.
8	My child restricts him/herself to certain foods because s/he is afraid that other foods will cause discomfort, choking, or vomiting	Çocuğum kendisini belirli yiyeceklerle sınırlandırır çünkü diğer yiyeceklerin rahatsızlık hissine, boğulmaya veya kusmaya neden olacağından korkar.
9	My child does not eat enough food because s/he is afraid of discomfort, choking, or vomiting.	Çocuğum yeterince yemek yemez, çünkü rahatsızlık hissinden, boğulmaktan veya kusmaktan korkar.

NIAS-PR: *Nine Items Avoidant/Restrictive Food Intake Disorder Screen-Parent Report.*

a greater likelihood of significant problems for the first four subscales and the total difficulties score. Higher scores on the prosocial behaviour subscale reflect strengths.

Depression Anxiety and Stress Scale

Depression Anxiety and Stress Scale (DASS-21) was used to determine the parents' current psychological status. It is a self-report questionnaire that consists of three subscales (Depression, Anxiety, and Stress) which include seven items per subscale (14). The reliability and validity of the DASS-21 were confirmed for the Turkish population (15). Higher scores indicate higher levels of each symptom (depression, anxiety, and stress).

Statistical analysis

The psychometric properties of the NIAS-PR were evaluated through tests for validity and reliability. Data analyses were carried out using RStudio version 1.3.1093 (R Studio, PBC) (16). Using the lavaan package, we conducted confirmatory factor analysis (CFA) with the "diagonally weighted least squares (DWLS)" estimator (17). Items with factor loadings above 0.40 were examined as salient. Model fit was evaluated using the comparative fit index (CFI; > 0.90 acceptable, > 0.95 excellent), Tucker–Lewis index (TLI; > 0.90 acceptable, > 0.95 excellent), root mean square error of approximation (RMSEA; < 0.08 good, < 0.05 excellent) (18). For the evaluation of convergent validity, Spearman's correlation coefficient was calculated between the NIAS-PR scores and subdimensions of CEBQ. Reliability was examined in terms of internal consistency, tested by Cronbach's alpha coefficient. Item-total correlation and Cronbach alpha coefficient when the item deleted were calculated for item analysis of the reliability.

The relationships between demographic variables and the subdimension scores of the NIAS were analysed via SPSS 11.5 (SPSS, Chicago, IL, USA). The differences between demographic variables in NIAS sub-dimension scores were examined using the Mann-Whitney U Test. Associations between continuous variables and NIAS-PR subdimensions scores were determined by Spearman correlation analysis. A value of $p < 0.050$ was considered statistically significant.

RESULTS

Sample characteristics

Two hundred sixty-eight children (133 girls, 49.62%; mean age 8.62, age range from 2 to 18 years) and parents (175 mothers, 65.29%) were included in the study. Our sample consisted of 30.22% preschool children (aged 2 to 5 years; n=81), 41.41% school-age (aged 6 to 11 years; n=111) children and 28.35% adolescents (aged 12 to 18 years, n=76). The parents were all literate and at least a primary education graduate. The demographic features of the participants are presented in Table II. BMI, derived from self-reported height and weight, ranged from 10.65 to 52.0 kg/m^2 (Median = 17.43 kg/m^2). Moreover, the BMI percentile ranged from 0.02 to 99.98 (Median = 69.15). Based on the recommended cutoff points of BMI for Turkish children (< 5th percentile=Underweight, 5th to 84th percentile= healthy weight, 85th to 95th percentile = overweight, and > 95% percentile = obese) (19), 19 (7.08%) had a BMI in the underweight range, 158 (58.95%) in the healthy weight range, 28 (10.44%) in the overweight range, and 63 (23.50%) in the obese range. Eating problems in children were reported by 33.58 % of parents (n=90). In 16.79 per cent of the sample (n=45), there was a history of psychiatric admission and follow-up for any reason. Parents reported that 95.89 per cent of the children (n=257) have a history of breastfeeding, and the median age of introducing new food is six months (min:0-max:30 months). In 20.14 per cent of the sample (n=54), parents reported difficulties introducing solid foods to their children. Parents reported (13.43%, n=36) concerns about their child's physical development being worse than their peers.

Table II: Demographic features of the sample (n = 268)

	Results
Age of child (years)*	8 (2-18)
Gender of the child (girl)†	133 (49.62)
BMI of the child (kg/m^2)*	17.43 (10.65-52)
Percentile BMI of the child	69.15 (0.02-99.98)
Parents (mother)†	175 (65.29)
Age of mother (years)*	37 (22-57)
Age of father (years)*	40 (27-68)
Education status of the mother†	
Primary School-Secondary School	53 (19.77)
High School	71 (26.49)
University	144 (53.73)
Education status of the father†	
Primary School-Secondary School	44 (16.41)
High School	84 (31.34)
University	140 (52.23)

****:** Median and minimum–maximum values are presented, **†:** n(%), **BMI:** Body mass index*

Validity of NIAS-PR

The items and factor loadings are given in Table III. All nine items loaded higher than 0.40. The factor loading values at the subscales level ranged between 0.78 and 0.90 for the Picky eating subscale, between 0.86 and 0.92 for the Appetite subscale, and between 0.89 and 0.94 for the Fear subscale. Also, the total contribution of three factors to the variance was 78.4%. The fit indices calculated as a result of the CFA were determined to be RMSEA = 0.092 (95%CI:0.070-0.115), CFI = 0.996 and TLI = 0.995).

For the present study, all CEBQ subscales were analysed for convergent validity of NIAS-PR. Eight subscales of CEBQ include food-approach behaviours (food responsiveness, enjoyment of food, emotional overeating, desire to drink) and

Table III: Confirmatory factor analysis results of Turkish NIAS-PR (n = 268)

Items		Picky Eating (F1)	Appetite (F2)	Fear (F3)
1.	My child is a picky eater	0.781		
2.	My child doesn't like many of the foods that other kids his or her age eat easily	0.887		
3.	My child refuses to eat everything but a short list of preferred foods	0.901		
4.	My child does not appear very interested in eating; s/he has a smaller appetite than other kids the same age		0.915	
5.	Left to his/her own devices, my child would not eat a large enough volume of food		0.858	
6.	It is difficult to get my child to eat a large enough volume, even when I offer foods that s/he really likes		0.864	
7.	My child refuses to eat because s/he is afraid of discomfort, choking, or vomiting			0.892
8.	My child restricts him/herself to certain foods because s/he is afraid that other foods will cause discomfort, choking, or vomiting			0.924
9.	My child does not eat enough food because s/he is afraid of discomfort, choking, or vomiting.			0.940
	Eigenvalue	2.209	2.320	2.533
	Variance Explanation Percentage	0.245	0.258	0.281

NIAS-PR: *Nine Items Avoidant/Restrictive Food Intake Disorder Screen-Parent Report*

Table IV: Correlations subscales for NIAS-PR with CEBQ (Convergent validity)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	1										
2.	0.682***	1									
3.	0.292***	0.446***	1								
4.	-0.154*	-0.357***	-0.132*	1							
5.	-0.132*	-0.242***	-0.115	0.700***	1						
6.	-0.442***	-0.622***	-0.295***	0.552***	0.441***	1					
7.	0.132*	0.065	0.134*	0.413***	0.382***	0.164*	1				
8.	0.545***	0.643***	0.226***	-0.215**	-0.134*	-0.562***	0.157*	1			
9.	0.347***	0.522***	0.307***	-0.133*	-0.111	-0.561***	0.134*	0.632***	1		
10.	0.243***	0.300***	0.104	0.100	0.177**	-0.224***	0.275***	0.522***	0.443***	1	
11.	-0.381***	-0.382***	-0.102	0.409***	0.383***	0.522***	0.174**	-0.411***	-0.152*	-0.001	1

1: *NIAS-PR Picky eating,* ***2:*** *NIAS-PR Appetite,* ***3:*** *NIAS-PR Fear,* ***4:*** *CEBQ-FR,* ***5:*** *CEBQ-OEO,* ***6:*** *CEBQ-EF,* ***7:*** *CEBQ-DD,* ***8:*** *CEBQ-SR,* ***9:*** *CEBQ-SE,* ***10:*** *CEBQ-EUA,* ***11:*** *CEBQ-FF, Spearman correlation analysis with rho coefficient;* ***NIAS-PR:*** *Nine Items Avoidant/Restrictive Food Intake Disorder Screen—Parent Report,* ***CEBQ=*** *Children's Eating Behavior Questionnaire,* ***FR=*** *Food responsiveness,* ***EOE=*** *Emotional overeating,* ***EF=*** *Enjoyment of food,* ***DD=****Desire to drink,* ***SR=*** *Satiety responsiveness,* ***SE=****Slowness in eating,* ***EUA=*** *Emotional undereating,* ***FF=*** *Food fussiness*

food-avoidance behaviours (satiety responsiveness, slowness in eating, food fussiness, and emotional undereating). It was hypothesised that CEBQ food-avoidance subscales would positively correlate with NIAS-PR subscales, and CEBQ food-approach subscales would negatively correlate with NIAS-PR subscales. There is a moderately negative correlation between CEBQ enjoyment food subscale scores and NIAS-PR picky eating scores and NIAS-PR appetite scores (r= -0.448, p<0.001; r=-0.627, p<0.001, respectively). However, CEBQ enjoyment food subscale scores negatively correlated weakly with NIAS-PR fear subscale scores (r= -0.297, p<0.001). There is a moderately positive correlation between CEBQ satiety responsiveness subscale scores and NIAS-PR picky eating scores and NIAS-PR appetite scores (r= 0.546, p<0.001; r= 0.640 p<0.001, respectively). Additionally, CEBQ slow eating scores correlated moderately with NIAS-PR appetite subscale scores (r= 0.529, p<0.001). Results of the correlation analysis of NIAS-PR subscales with CEBQ subdimensions (Convergent validity) have been shown in Table IV.

Reliability of NIAS-PR

Internal consistency (Cronbach alpha coefficient) analysis was used to determine the reliability of the NIAS-PR. The median (min–max) was 5.91 (0.00-12.84) for the Picky Eating score,

Table V: Analysis of the reliability of the Turkish NIAS-parent form (n=268)

Factor	Item Total Correlation	Alpha If Item Deleted
Picky Eating Cronbach's Alpha=0.862		
My child is a picky eater	0.702	0.838
My child doesn't like many of the foods that other kids his or her age eat easily	0.766	0.779
My child refuses to eat everything but a short list of preferred foods	0.746	0.798
Appetite Cronbach's Alpha=0.872		
My child does not appear very interested in eating; s/he has a smaller appetite than other kids the same age	0.809	0.768
Left to his/her own devices, my child would not eat a large enough volume of food	0.752	0.823
It is difficult to get my child to eat a large enough volume, even when I offer foods that s/he really likes	0.708	0.861
Fear Cronbach's Alpha=0.914		
My child refuses to eat because s/he is afraid of discomfort, choking, or vomiting	0.801	0.896
My child restricts him/herself to certain foods because s/he is afraid that other foods will cause discomfort, choking, or vomiting	0.840	0.865
My child does not eat enough food because s/he is afraid of discomfort, choking, or vomiting	0.838	0.866

NIAS-PR: Nine Items Avoidant/Restrictive Food Intake Disorder Screen-Parent Report

Table VI: Correlations subscales for NIAS-PR with SDQ, DASS-21 and other clinical variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	1										
2.	0.683***	1									
3.	0.291***	0.441***	1								
4.	0.213**	0.198**	0.225**	1							
5.	0.212**	0.245***	0.177**	0.557***	1						
6.	-0.017	-0.081	-0.091	-0.244***	-0.371***	1					
7.	0.290***	0.250***	0.164*	0.363***	0.442**	-0.187**	1				
8.	0.264***	0.224**	0.090	0.381***	0.464***	-0.230**	0.871***	1			
9.	0.311***	0.243***	0.153*	0.323***	0.410***	-0.222**	0.800***	0.832***	1		
10.	-0.081	-0.272***	-0.132*	0.071	-0.142*	.214**	-0.024	-0.063	-0.074	1	
11.	-0.054	-0.273***	-0.061	-0.042	-0.085	0.073	0.023	0.014	0.106	0.122*	1

1: *NIAS-PR Picky eating,* ***2:*** *NIAS-PR Appetite,* ***3:*** *NIAS-PR Fear,* ***4:*** *SDQ-internalizing,* ***5:*** *SDQ-externalizing,* ***6:*** *SDQ-prosocial,* ***7:*** *DASS-21 depression,* ***8:*** *DASS-21 anxiety,* ***9:*** *DASS-21 stress,* ***10:*** *Age,* ***11:*** *BMI percentile. Spearman correlation analysis with rho coefficient;* ***NIAS-PR:*** *Nine Items Avoidant/Restrictive Food Intake Disorder Screen—Parent Report,* ***SDQ:*** *Strengths and Difficulties Questionnaire-Parents Form,* ***DASS-21=*** *Depression Anxiety and Stress Scale,* ***BMI:*** *Body mass index,* ****** $p < 0.050$; ******* $p < 0.010$; ******** $p < 0.001$

4.32 (0.00–13.19) for the Appetite score and 1.86 (0.00-13.78) for the Fear score. In the analyses conducted for the subscales, the Cronbach alpha coefficient was found to be 0.86 for the Picky Eating subscale, 0.87 for the Appetite subscale, and 0.91 for the Fear subscale. The total Cronbach alpha coefficient was found to be 0.90. In the NIAS-PR, the total item correlation was adequate for all items. Removing any item from the scale did not cause an important change in Cronbach's alpha coefficient of the relevant sub-dimension. Results of the analysis of the reliability of the Turkish NIAS-parent form have been shown in Table V.

Relationships between NIAS-PR and other clinical measurements

There is a significant difference in NIAS-PR picky eating (U ($N_{difficulty\ solid\ food}$ = 54, $N_{no\ difficulty\ solid\ food}$ = 214) = 3755, z = -3.821, p <0.001), appetite (U ($N_{difficulty\ solid\ food}$ = 54, $N_{no\ difficulty\ solid\ food}$ = 214) = 3561, z = -4.223, p <0.001, and fear scores (U ($N_{difficulty\ solid\ food}$ = 54, $N_{no\ difficulty\ solid\ food}$ = 214) = 3977, z = -3.550, p <0.001) between those who reported difficulty initiating solid food and those who did not. All NIAS subscales scores were higher in the group with reported difficulty initiating solid food than no difficulty with solid food. There is no significant difference in NIAS-PR picky eating scores between parents with and without concerns about children's physical development (U ($N_{physical\ development\ concern}$ = 36, $N_{no\ physical\ development\ concern}$ = 232) = 3321, z = -1.910, p=0.056). However, in these groups, there is a significant difference in NIAS-PR appetite scores (U ($N_{physical\ development\ concern}$ = 36, $N_{no\ physical\ development\ concern}$ = 232) = 2626, z= -3.531, p <0.001) and NIAS-PR fear scores U ($N_{physical\ development\ concern}$ = 36, $N_{no\ physical\ development\ concern}$ = 232) = 3052, z= -2.649, p=0.008). Spearman correlation results of NIAS-PR and other clinical measurements were presented in Table VI.

DISCUSSION

The current study provided evidence for the validity of the translated Turkish version of the NIAS-PR in the pediatric population in Turkey. The three-factor structure of the NIAS—Picky eating, Appetite, and fear—was replicated in the Turkish NIAS-PR. Our findings were consistent with previous studies supporting the three-factor structure and the addition of ARFID subtypes to DSM-5 (1,8,9,20,21). The three NIAS-PR subscales are intercorrelated; however, they represent different constructs. To better understand the underlying mechanisms that caused avoiding and restricting food intake and to provide more effective therapeutic intervention, it is necessary to reveal these different constructs and presentations of ARFID (8, 9).

The Turkish NIAS-PR subscales were associated with other clinical measures, including age, BMI, children's behavioural problems, parents' psychological distress. Age was negatively associated with Appetite and Fear subscales but unexpectedly not with Picky Eating. Studies in picky eating trajectories indicated that picky eating is predominantly present in preschool children, and picky eating is usually a transient behaviour and part of normal development in preschool children (22-24). Prevalence of picky eating was highest at three years of age (27.6%) and lowest at six years of age (13.2%) in the population-based cohort (23). However, a prospective study reported that picky eating was often a chronic problem affecting 40% of children for more than two years (25). Mascola et al. (25) demonstrated that the incidence of picky eating decreases after preschool, but the prevalence remained relatively stable. We found no association between age and picky eating, which seems consistent with picky eating being a stable trait reflecting individual eating style. Only Appetite subscale of the Turkish NIAS-PR was related to BMI. Unexpectedly, there was no relationship between picky eating and BMI percentile in our study. Findings regarding the relationship between picky eating and children's weight status are conflicting but indicate a lower BMI in picky eaters (26-29). Children with picky eating eat a selective number of foods, which may result in an inadequate intake of necessary nutrients (30). These picky eaters may compensate for their restricted intake of disliked food with much more palatable energy-dense food and favourite food (31). Thus, these picky eating behaviours may not affect their weight status or BMI. We may have found no relationship between BMI percentile and picky eating because of these compensatory eating behaviours.

All subscales of the Turkish NIAS-PR were associated with comorbid behavioural and emotional problems. Picky eating is associated with emotional and behavioural problems, including internalising and externalising problems (32-34). Moreover, a population-based study indicated that internalising and externalising problems predicted picky eating in children from 6 to 18 years old (34). Children's avoidance and restrictive eating pattern might impair their overall psychosocial functioning, resulting in behavioural and emotional problems (35). In our study, NIAS-PR subdimensions were related to behavioural problems, but there was a low correlation. Our sample consisted of the general pediatric population, and 16.8 per cent of the sample had a history of psychiatric admission for any reason. The heterogeneity of the sample may be related to this low level of correlation. The association between ARFID-related eating and behavioural problems may be more evident in a group with a clinically significant ARFID eating disorder. Our study showed that picky eating and appetite subscales were associated with all parental psychopathology symptoms; however, fear subscales were positively related to only depression and stress levels. Picky eating has been associated with mealtime conflict and increased family stress (25, 32). Studies have suggested that negative parental feeding practices may be related to parents' anxiety about their children eating too little and low parental self-efficacy (36-38). Their children's picky eating and insufficient intake can cause stress to parents. Higher stress may negatively impact family relationships and parental feeding practices, so parents' pressure to eat may increase picky eating and food avoidance. It has been demonstrated that there is a bidirectional relationship between parental pressure to eat and picky eating (39).

The three subscales of the NIAS-PR—Picky eating, Appetite, and Fear—were differentially related to other CEBQ eating behaviours, supporting the convergent validity of NIAS-PR and CEBQ. As expected, the Appetite and Picky eating subscales were negatively associated with food-approach subscales of CEBQ (Food responsiveness, Enjoyment of food, Emotional overeating) and were positively correlated with food avoidance subscales of CEBQ (satiety responsiveness and slowness). Unexpectedly, CEBQ food fussiness and NIAS-picky eating were correlated weakly. The different terminology of selective eating could cause this result. The definitions of picky/fussy eating are varied in the literature (30). Food fussiness of CEBQ includes food neophobia-related items, which refers to the unwillingness to eat new foods (10). However, NIAS-PR picky eating items are more related to the consumption of an insufficient amount or inadequate variety of food. Picky eaters may have no problem trying new foods but refuse to eat them every time they are presented (40). In our study, there was a low relationship between the NIAS-Fear subscale which shows fear of aversive consequences from eating and CEBQ-Desire to drink, CEBQ-Satiety responsiveness, and CEBQ-Slowness in eating. However, there was no relationship between CEBQ-Emotional undereating and emotional overeating and NIAS-Fear. A significant part of our sample (28.3 %) was adolescents. Since our assessment was based on only the parent report, the impacts of adolescents' internal emotional states on eating behaviour may not have been recognised by their parents.

The reliability of the Turkish version of NIAS-PR proved to be satisfactory (total Cronbach's alpha=0.90) in the pediatric population (2-18 years). The general Cronbach's alpha coefficient of the Turkish version of the NIAS-PR was quite similar to that of

the Polish version of NIAS-PR in children (9). The results of this study demonstrated a good internal consistency of the Turkish version of the NIAS-PR; thus, we recommend that healthcare providers utilise this instrument as a screening tool for ARFID-related eating behaviours in Turkish children and adolescents.

The current study has several limitations. First, eating and feeding behaviours were based on only parent reporting. Our study did not use any psychiatric clinic interview for eating disorder symptomatology since there is no Turkish version of the clinical interview. Thus, we could not determine the rates of eating disorders in the sample. Second, our study's cross-sectional design did not allow us to evaluate the test–retest reliability of the Turkish NIAS-PR. Third, the children's weight and height were reported by parents, and researchers did not carry out anthropometric measures, so this may cause biased reporting due to parental concerns about their child's weight. Finally, knowledge about our sample features (e.g. chronic diseases and medical drug use) that may impact eating behaviours was limited. NIAS-PR validity should be re-evaluated within specific pediatric samples with detailed information in future studies.

CONCLUSION

The current study demonstrated a good internal consistency of the Turkish version of the NIAS-PR. Moreover, we confirmed the three-factor structure of the Turkish version of NIAS-PR. To our knowledge, the NIAS-PR is the first specific measurement tool to measure ARFID symptoms in Turkey. This study results provide an instrument for ARFID research in Turkish children and adolescents. It is worth mentioning that the NIAS-PR is developed as a screening questionnaire, so mental health professionals should deepen these eating symptoms with clinical interviews. We recommend that the NIAS-PR be validated in different clinical samples.

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