



TURKISH VALIDITY AND RELIABILITY STUDY OF A SYMPTOM SCREENING TOOL (MINI-SSPedi) IN 4-7-YEAR-OLD CHILDREN RECEIVING CANCER TREATMENT*

Hamide Zengin¹, Aslı Akdeniz Kudubes² and Gülcin Ozalp Gerceker³

¹Department of Pediatric Nursing, Faculty of Health Sciences,
Eskisehir Osmangazi University, Eskisehir, Turkey;

²Department of Pediatric Nursing, Faculty of Health Sciences,
Bilecik Seyh Edebali University, Bilecik, Turkey;

³Department of Pediatric Nursing, Faculty of Nursing, Dokuz Eylül University, İzmir, Turkey

SUMMARY – This research was carried out to adapt the Symptom Screening in Pediatrics Tool for Turkish children with cancer aged 4-7 years, and to evaluate its validity and reliability. This study, which was descriptive and methodological, was conducted on 159 children receiving cancer treatments between June 2021 and December 2021. Data collection tools included a socio-demographic form and the Symptom Screening in Pediatrics Tool for children aged 4-7 years (mini-SSPedi). Data were analyzed using Cronbach's alpha, factor analysis, and item-total score analysis. There were 15 items on the mini-SSPedi, and it had one dimension. The results of the exploratory factor analysis indicated that total factor loading was >0.30 and that the Kaiser-Meyer-Olkin value was 0.831. The confirmatory factor analysis indicated that the fit indices were χ^2/sd : 1.739 ($p=0.000$), GFI 0.895, CFI 0.919, TLI 0.897, RMSEA 0.068 and SRMR 0.064. Cronbach's alpha coefficient of the total scale was 0.846. The correlation between the items and total scale score ranged between 0.411 and 0.749. The mini-SSPedi was found to be a valid and reliable scale for the Turkish sample. The mini-SSPedi can contribute to determination of symptom screening in children with cancer aged 4-7 years.

Key words: *Symptom screening scale; Children; Cancer; Validity; Reliability*

Introduction

Although medical developments in pediatric oncology continue, childhood cancers remain a life-threatening chronic disease^{1,2}. The care support needed by patients for their current condition and problems

should not be overlooked due to the attention on cancer diagnosis and treatment. The progression of cancer or the management of symptoms that occur due to cancer treatment is an important issue while trying to prolong the life of the patient³.

The methods that are employed in cancer treatment improve the recovery rates, but they can also cause the child and his/her family to experience undesirable results. Cancer treatment may result in many unwanted symptoms in children. These symptoms are thrombocytopenia, leukopenia, anemia, nausea, vomiting, weight loss, constipation, diarrhea, fatigue, stomatitis, neutropenia, and fever^{1,4-6}.

Correspondence to: *Assoc. Prof. Hamide Zengin, PhD*, Eskisehir Osmangazi University, Faculty of Health Sciences, Department of Pediatric Nursing, Eskisehir, Turkey
E- mail: hamide.kupelizengin@gmail.com

*This study was presented as a summary oral presentation at the 1st International Congress of Palliative Care in Nursing, October 6-8, 2022.

Received January 23, 2023, accepted May 27, 2024

Symptom management is an important domain since the symptoms occurring in cancer patients affect the maintenance of treatment, quality of life, morbidity and mortality. This domain has an extremely important place in determining the effectiveness of care and creating evidence-based practice guidelines, as well as making it possible to be creative in patient care and to make significant changes in the patient's quality of life^{7,8}.

Symptom screening scales (predominantly pain and quality of life) in children with cancer mostly address children aged eight years and over^{9,10}. The appropriateness of symptom reporting tools for children with cancer younger than eight years of age is much less known. There is no measurement tool in the Turkish literature that can be used in symptom screening for children with cancer aged 4–7 years.

The aim of this research was to test the validity and reliability of the Symptom Screening in Pediatrics Tool for children aged 4–7 years (mini-SSPedi), which was developed by Tomlinson *et al.*¹¹ and can be used in children who are aged 4–7 years and receive cancer treatment in Turkey.

Research questions

- Is the symptom screening in pediatrics tool (mini-SSPedi) a valid scale for Turkish community?
- Is the symptom screening in pediatrics tool (mini-SSPedi) a reliable scale for Turkish community?

Subjects and Methods

Type of the study

This descriptive and methodological study was conducted to test the validity and reliability of the Turkish version of the mini-SSPedi scale. Ethics approval for the study was received from the University Faculty of Medicine Non-Interventional Research Ethics Committee (no. 51056 as of October 13, 2021).

Sample and population of the study

The study was carried out from June to December 2021 and included patients with malignancy aged 4 to 7 years who were admitted to the Hematology-Oncology Department or outpatient clinic of a children's hospital and followed up. A suggested way for sample calculation while developing scales is to apply 3 rules, namely, the 5s, 10s, and 100s rule. Accordingly,

the researcher needs to recruit at least 5 individuals *per* item to conduct factor analysis. In cases where reaching the sample is not problematic, the count of subjects *per* item should be $10^{12,13}$. Accordingly, the sample size was calculated as 150 by recruiting 10 cancer patients *per* item to carry out the validity and reliability study of the mini-SSPedi tool (15 items). To identify the invariance feature of the tool more clearly, 159 cancer patients in total were included in the study sample.

The study inclusion criteria were as follows:

- being able to speak and understand Turkish,
- children with cancer aged 4–7 years,
- receiving cancer treatment, and
- parental consent to participate in the study on a voluntary basis.

Exclusion criteria were:

- illness severity, and
- cognitive disability or other impairment.

Data collection instruments

Data collection tools included a Descriptive Information Form and the mini-SSPedi.

Descriptive information form

This form has eight questions about the child's age, gender, family type, income level, diagnosis, time elapsed since the first diagnosis, relapse status, and type of treatment received.

The symptom screening in pediatrics tool (mini-SSPedi)

This scale was developed by Tomlinson *et al.*¹¹. It is a 15-item 3-point Likert-type scale (not bothered at all, 0; slightly bothered, 1; and extremely bothered, 2), and responses are marked according to facial expressions in each item of the scale asked to children. The scales tested were all pictorial and based on the Wong-Baker FACES pain scale¹⁴, Faces Pain Scale-Revised¹⁵, and Pieces of Hurt (Poker Chip tool)¹⁴. Cronbach's alpha value of the scale was not reported in the original study¹¹.

Data assessment

In the study, data on 159 patients were analyzed using IBM SPSS Statistics 25 and IBM SPSS AMOS 20 software packages. Descriptive statistics (n, %) were presented for categorical variables. The content validity index (CVI) and content validity ratio (CVR) were calculated during assessment of the scores that

were given by the experts. Within the scope of validity and reliability analyses of the scale, first, explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) studies were conducted. Finally, reliability analysis (Cronbach's alpha) was performed to find out internal consistency of the factors. Pearson correlation analysis was used for item-total score analysis. On data analysis, $p=0.05$ was accepted as the margin of error.

Ethical considerations

First, permission of the author who developed the scale was obtained *via* an email to conduct the Turkish validity and reliability study of the scale. The study was approved by the University Non-Interventional Research Ethics Committee (date: October 13, 2021; issue: 51056). Written institutional permission of the Children's Hospital was obtained. In addition, the children and parents who were included in the study were informed about the purpose of the research, and their written and verbal consent was obtained.

Steps of research

The validity and reliability studies of the scale were conducted based on the following steps:

Language validity of the scale

While translating the scale items into Turkish, considering the use of the most appropriate sentence structure and idioms in the language, in the first phase, the scale was translated from its original language to Turkish separately by two faculty members of the Department of Child Health and Diseases Nursing who were fluent in Turkish and English, and a translator who had a good command of English. Later, these translations were evaluated by the researchers, and the Turkish form of the scale was rearranged. This form was translated back into English by an independent expert linguist. After necessary corrections, the translation phase was finalized with adaptation of the measurement tool to Turkish and its equivalence with the English original.

Scope validity of the scale

After translation of the scale from English to Turkish, it was submitted to the opinions of experts for content validity. A total of nine specialists from the fields of Child Health and Diseases Nursing, Internal

Medicine Nursing, and Medicine were consulted. Experts were requested to assess each item in terms of its appropriateness and intelligibility. In the Davis technique, each item on the scale is evaluated by using four options: 1) not appropriate; 2) somewhat appropriate; 3) appropriate; and 4) completely appropriate. The experts were requested to score each statement with scores ranging from 1 to 4 and state their opinions and recommendations for each item. The items were revised and necessary modifications were made based on the feedback received from the experts. Eventually, 15 items of the scale were modified in terms of linguistic features and expressions according to the recommendations of the experts.

The CVI was employed to assess expert opinions. For each item, CVI was estimated by finding the mean value of the CVR to find out if the experts evaluated a given item essential. The CVI of each item is obtained by dividing the count of experts choosing one of the following options: (a) appropriate or (b) needs a slight revision, by the total count of experts. Since the count of experts was nine, it was concluded that items with a CVR value greater than 0.75 met the necessary criteria¹⁶. In our study, the item-level CVI was found to be between 0.88 and 1.00, and the total CVI value was 0.984. Regarding the content validity of the scale, a statistically significant result was found ($p<0.005$) because $CVI>CVR$ was achieved.

Preliminary test

After achieving the goodness-of-fit for inter-rater agreement, the scale was piloted on 10 children. The intelligibility of the scale was found to be adequate in the pilot application, and then it was applied to the whole sample for assessment of its validity and reliability.

Results

The mean age of 159 study participants was 5.77 ± 1.11 (min=4, max=7) years, 63.5% were male, 48.4% had an extended family, 78.6% had equal income and expenditures, and 53.5% had been diagnosed with hematologic malignancy. It was determined that 87.4% of the participants did not have a relapse and that the mean time elapsed from the diagnosis was 16.54 ± 13.65 (min=1, max=76) days (Table 1).

Table 1. Characteristics of study patients

Variable		n	%
Gender	Female	58	36.5
	Male	101	63.5
Family type	Core	74	46.5
	Extended	77	48.4
	Broken	8	5.0
Perceived economic level	Good	2	1.3
	Middle	125	78.6
	Poor	32	20.1
Diagnosis	Hematologic	85	53.5
	Oncologic	74	46.5
Status of relapse	Yes	20	12.6
	No	139	87.4
Mean age 5.77±1.11 (min 4, max 7) years			
Mean time elapsed after diagnosis 16.54±13.65 (min 1, max 76) days			

Table 2. Results of exploratory factor analysis (N=159)

Item	Factor loading
1) Feeling sad	0.487
2) Feeling scared or worried	0.723
3) Feeling cranky or angry	0.758
4) Forgetting things	0.312
5) Changes in how you look	0.553
6) Feeling tired	0.673
7) Mouth sores	0.547
8) Headache	0.450
9) Hurt or pain (other than headache)	0.533
10) Hands or feet falling asleep or tingling	0.339
11) Throwing up or feeling like you may throw up	0.725
12) Feeling more or less hungry than you usually do	0.788
13) Food tastes different	0.762
14) Constipation (hard to poop)	0.340
15) Diarrhea (watery, runny poop)	0.477
Kaiser-Meyer-Olkin coefficient=0.831; Bartlett's test $\chi^2(105)=826.632$; $p=0.000$	
Explained variance (%)=34.424; eigenvalue(Λ)=5.164	

Validity

Construct validity

Construct validity of the scale was determined by exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).

Results of EFA

After applying EFA, principal component analysis was conducted as a factor extraction method. The Kaiser-Meyer-Olkin (KMO) test was used to find out the appropriateness of the sample to examine the factor structure, and Bartlett's test was employed to determine whether factor analysis could be performed on the scale¹⁷.

Before the application of the EFA, the KMO method was employed to test the appropriateness of the sample size for factorization. Accordingly, the value of KMO was determined as 0.831. Therefore, it was determined that the sample size was 'perfectly appropriate' for conducting factor analysis^{18,19}. In addition, examination of the results of Bartlett's test of sphericity indicated that the χ^2 value was significant ($\chi^2(105)=826.632$; $p<0.01$). As a result, it was accepted that the data indicated a multivariate normal distribution (Table 2).

As a result of EFA, it was seen that there was a component with an eigenvalue greater than 1 (5.164) for 15 items. This component was calculated to contribute to the total variance by 34.424% (Table 2).

In the EFA performed to reveal the factor pattern that the scale had in scale adaptation studies, the accepted level for factor loading values was determined as 0.300¹³. The factor loadings of the scale were determined to vary from 0.312 to 0.788 in the present study (Table 2).

Results of CFA

The measurement model that was established to verify the structure consisting of 15 items and a single factor was analyzed. According to CFA, the result of the structural equation model of the scale was found to be significant at $p=0.000$, and the 15 items making up the scale were related to the whole scale structure. The analysis result indicated that the model did not show enough fit, so model improvement studies were

carried out. First of all, the reduced χ^2 values were examined for possible changes to be made in the model by examining the table of modification indices. While the improvement was being made, the variables reducing the fit were identified, and novel covariances¹⁹ were created for residual values that had high values of covariance (e2-e3, e4-e10, e5-e8, e7-e8, e7-e10, e10-e14, e14-e15). According to the measurement model, the items of the measurement model that was validated with 15 items and the standardized regression coefficients of the paths on the one-way arrows, in other words, factor loads, were evaluated, and it was determined that there was no factor load value below 0.226. Figure 1 shows factor loadings of all items, which varied from 0.781 to 0.226.

The goodness-of-fit indices of the mini-SSPedi scale were as follows: $\chi^2=1.739$ ($p=0.000$); GFI, 0.895; CFI, 0.919; TLI, 0.897; AGFI, 0.849; RMSEA, 0.068, and SRMR, 0.064 (Table 3).

Reliability

As seen in Table 4, Cronbach's alpha value of the scale (15 items) was determined as 0.846. The alpha coefficient is a criterion of the homogeneity of the items on a measurement tool. If the alpha coefficient of the scale is high, it can be interpreted that "the items on the scale are coherent with each other and that they examine the elements of the same feature, that is, all items work in harmony". As a result, if the alpha coefficient is high, the answers given by respondents to the items on a scale are coherent with each other and the items are consistent with the conceptual structure of the scale. It is stated that a Cronbach's alpha value greater than 0.70 is enough for reliability^{18,20}. In this case, it was determined that the scale had a high reliability.

Item-total score analysis of the scale

The item-total score analysis shows correlation between the score of each item on a scale and the total score obtained from that scale. It shows if the items on a scale measure the intended quality^{21,22}. This value is recommended to be greater than 0.20 and as close to 1.0 as possible²³. In the present study, the correlation between the items and the total scale score was found to vary from 0.411 to 0.749 (Table 4).

Table 3. Fit indices and goodness-of-fit values of the measurement model

Fit index	Fit index value	Perfect fit value	Acceptable fit value
χ^2/sd	1.739	≤ 3	≤ 5
GFI	0.895	≥ 0.90	≥ 0.85
CFI	0.919	≥ 0.97	≥ 0.85
TLI	0.897	≥ 0.95	≥ 0.85
AGFI	0.849	≥ 0.90	≥ 0.85
RMSEA	0.068	≤ 0.08	≤ 0.10
SRMR	0.064	≤ 0.05	≤ 0.10

GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; AGFI = Adjusted Goodness of Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual

Table 4. Results of reliability analysis and correlations of the item-total score (N=159)

Item	$\chi \pm \text{SD}$	Item-total score correlation (r)*
Item 1	2.12 $\pm$ 0.54	0.474
Item 2	2.22 $\pm$ 0.65	0.663
Item 3	2.10 $\pm$ 0.70	0.721
Item 4	1.50 $\pm$ 0.77	0.411
Item 5	1.77 $\pm$ 0.72	0.574
Item 6	2.38 $\pm$ 0.57	0.640
Item 7	1.79 $\pm$ 0.67	0.569
Item 8	1.32 $\pm$ 0.59	0.483
Item 9	2.30 $\pm$ 0.64	0.501
Item 10	1.55 $\pm$ 0.77	0.452
Item 11	2.25 $\pm$ 0.65	0.667
Item 12	1.96 $\pm$ 0.73	0.749
Item 13	2.07 $\pm$ 0.75	0.718
Item 14	1.74 $\pm$ 0.85	0.411
Item 15	1.70 $\pm$ 0.81	0.509
Total scale Cronbach α =0.846		

*p<0.001; SD = standard deviation

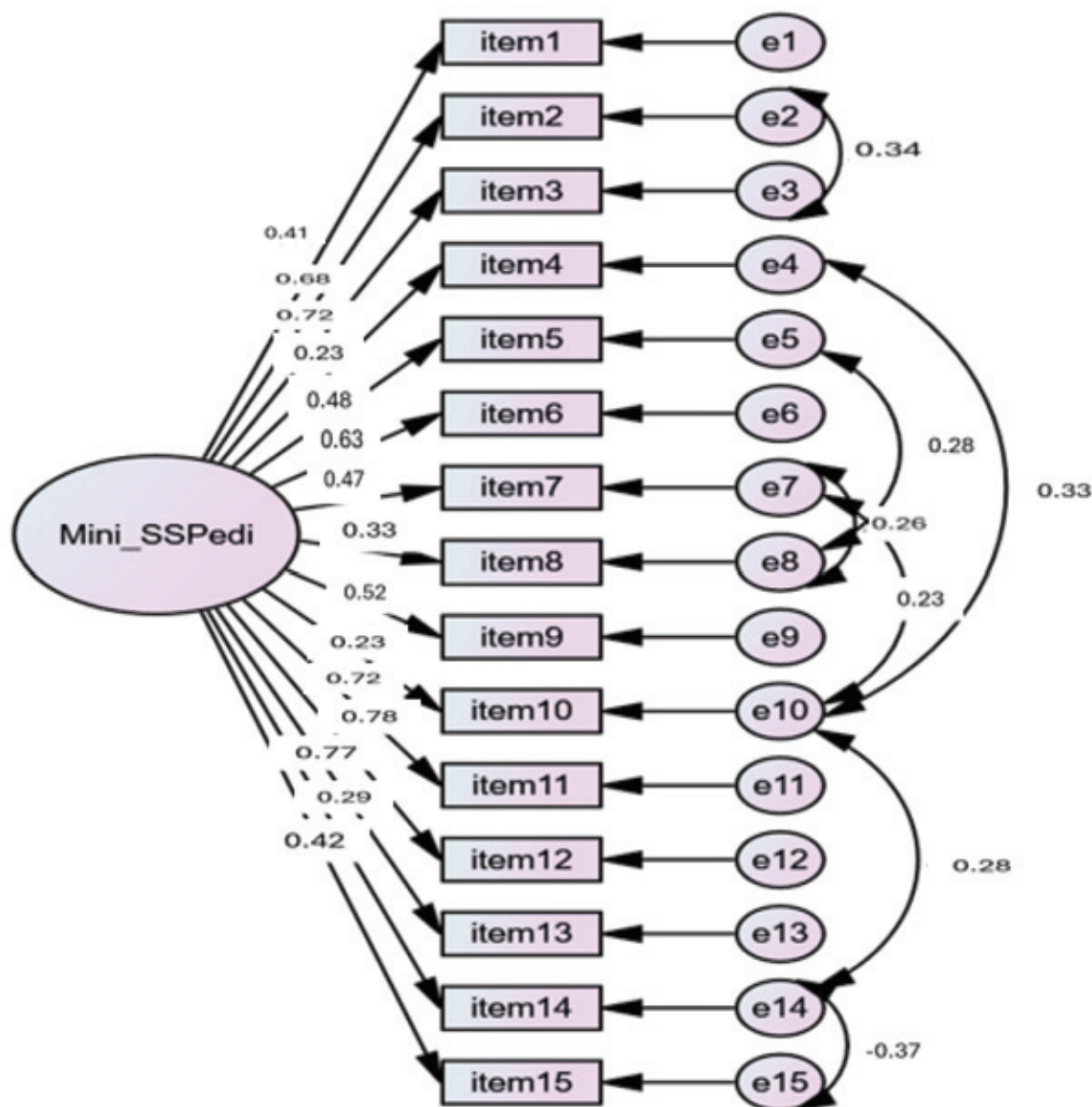


Fig. 1. Measurement model of the scale.

Discussion

The mini-SSPedi tool was first developed by Dupuis *et al.* for the 8-18 age group²⁴, and later Tomlison *et al.* conducted a preliminary study on children aged 4-7 years¹¹. Reliability studies of the proxy-SSPedi and mini-SSPedi in pediatric patients aged 2-7 years receiving cancer treatments was conducted by Tomlison *et al.*²⁵. The Turkish adaptation study was conducted upon the statement of Tomlison and Sung, who developed the tool, that there was no problem in conducting Turkish validity and reliability study^{24,25}.

In this study, the item-based content validity index value was found to vary from 0.88 to 1.00 and the total content validity index value was 0.984. In the literature, it is recommended that the item and scale-based content validity index value should be above 0.80. An index value above 0.80 indicates inter-rater agreement²⁶. The item and scale-based content validity indices in this study were over 0.80 and this indicated that inter-rater agreement was achieved and that the tool measured the intended feature sufficiently.

To ensure the construct validity of a scale, the suitability and adequacy of data for factor analysis should be evaluated by performing the Bartlett's sphericity test and KMO analysis. To conduct factor analysis, the result of the Bartlett's sphericity test must be at a statistically significant level. It is also emphasized that the KMO value should be 0.60 and above²⁷. The EFA results given in Table 2 showed that the sample size of the study was enough to perform factor analysis. It was found that the sample size in the study in which the original scale was developed by Tomlinson *et al.* was less than in the present study¹¹.

One of the important indicators of achieving construct validity in scale development, validity, and reliability studies is the rate of explained variance. Although it is recommended that this rate should be above 40%¹³, various sources emphasize that 30% or higher is an acceptable level^{28,29}. The rate of explained variance in this study was 34.42%, indicating an adequate construct validity level (Table 2).

The main purpose of factor analysis is to reduce dimensions. The purpose of EFA, which is the most common application of dimension reduction, is to make the data set easier to explain by making it smaller. In the literature, it is recommended that the item factor load should be 0.30 or above. It is emphasized that items with a factor load below 0.30 should be removed from the scale¹³. In this study, factor loads of the scale items were found to be greater than 0.30 (Table 2), which showed that the factor structure of the measurement tool was strong.

According to recommendations, CFA should be used to analyze the factor structure shown by EFA^{12,30}. As a result of CFA, the one-dimensional structure of the scale was confirmed. According to the literature, model fit indices that are greater than 0.85 are recognized as a sign of an acceptable level of fit. Also, it is highlighted that an χ^2/df value less than five and a Root Mean Square Error of Approximation (RMSEA) value less than 0.10 are acceptable^{12,19}. In this study, it was determined that the fit indices were consistent with the acceptable values suggested in the literature (Table 3). Since the results of CFA were not given in the study of the original scale, they could not be compared^{11,25}.

Cronbach's alpha shows whether items on a scale measure the same feature. It also shows if the items on the scale are related to the subject that is intended to be measured. In the literature, it is emphasized that this

value should be between 0.60 and 1.00³¹. In this study, it was determined that Cronbach's alpha of the scale was 0.846, the items adequately measured symptoms of children who had cancer and were aged 4-7 years, and that the symptom screening tool was highly reliable. Cronbach's alpha coefficient of the mini-SSPedi scale for the 8-18 age group was found to be 0.83²⁴. In the study where reliability analysis of mini-SSPedi was conducted on children aged 6-7 years receiving cancer treatment, the internal consistency coefficient (ICC) was recorded as 0.83 and 0.85, which was similar to this study²⁴.

Another analysis suggested to be performed in scale validity and reliability studies is item-total score analysis. This analysis is used to investigate whether the items on a scale measure the desired variable. Thus, the correlation between the scores on the scale items and the total scale score is revealed²². Although a value greater than 0.20 is acceptable, in many studies in the literature it is recommended to be 0.30 and above. It is emphasized that these values should be positive and as close to 1.0 as possible²². In this study, the values were found to be greater than 0.30 and a positive relationship was determined (Table 4).

Limitations

A limitation of the study was that the test-retest procedure could not be performed in the study. Another limitation of the study was that the study was conducted in a single center.

Conclusions

The mini-SSPedi: Symptom Screening in Pediatrics was found to be a reliable and valid measurement instrument for the Turkish sample. It can contribute to symptom screening in children with cancer aged 4-7 years. In addition, researchers will be able to use the mini-SSPedi symptom screening tool in a variety of national and cross-cultural studies. Health professionals (pediatric nurses, doctors, etc.) working in pediatric hematology and pediatric oncology departments in Turkey will have access to a measurement instrument which can be employed to identify, manage, and assess daily symptoms in children who are aged 4-7 years and are receiving cancer treatment. In addition, nurses will have access to a reliable and valid instrument that allows evaluation of undesirable symptoms in patient care before and after care with a scale of faces.

Moreover, this screening tool can be used not only by health professionals but also by primary caregivers of the child.

Acknowledgment

The authors wish to thank all the participants in this study.

Appendix 1. Turkish form of the mini-SSPedi: Symptom Screening in Pediatrics

Aşağıdaki şikayetlerden her birinin bugün seni rahatsız etme derecesini en iyi tarif eden yüz ifadesini göstererek bize bildirir misin?			
	Hiç rahatsız etmedi	Orta düzeyde rahatsız etti	Son derece rahatsız etti
			
Üzgün hissetme	☐	☐	☐
Korkmuş veya endişeli hissetme	☐	☐	☐
Huysuz veya kızgın hissetme	☐	☐	☐
Bir şeyleri unutma	☐	☐	☐
Nasıl görüldüğüne ilgili değişiklikler	☐	☐	☐
Yorgun hissetme	☐	☐	☐
Ağız yaraları	☐	☐	☐
Baş ağrısı	☐	☐	☐
Acı ya da ağrı (baş ağrısı dışında)	☐	☐	☐
Ellerde veya ayaklarda uyuşma veya karıncalanma	☐	☐	☐
Kusma ya da kusacakmış gibi hissetme	☐	☐	☐
Normale göre daha çok veya daha az aç hissetme	☐	☐	☐
Yemeklerin tadının farklı olması	☐	☐	☐
Konstipasyon/kabızlık (zor kaka yapma)	☐	☐	☐
Diyare/İshal (sulu, akıp giden kaka yapma)	☐	☐	☐
Son zamanlarda seni rahatsız eden diğer durumları anlattıysan sevinirim			

References

- Kudubeş AA, Bektaş M. Effect of fatigue on quality of life in pediatric oncology patients. *J Pediatr Res.* 2017;4(3):96-102. doi: 10.4274/JPR.63634.
- Islami F, Ward EM, Sung H, Cronin KA, Tangka FKL, Sherman RL, *et al.* Annual Report to the Nation on the Status of Cancer, Part 1: National Cancer Statistics. *J Natl Cancer Inst.* 2021 Nov 29;113(12):1648-69. doi: 10.1093/jnci/djab131.
- Cheng BT, Rost M, De Clercq E, Arnold L, Elger BS, Wangmo T. Palliative care initiation in pediatric oncology patients: a systematic review. *Cancer Med.* 2019;8(1):3-12. doi: 10.1002/cam4.1907
- Hyslop S, Sung L, Stein E, Dupuis LL, Spiegler B, Vettese E, Tomlinson D. Identifying symptoms using the drawings of 4-7 year olds with cancer. *Eur J Oncol Nurs.* 2018 Oct;36:56-61. doi: 10.1016/j.ejon.2018.08.004.
- Leahy AB, Feudtner C, Basch E. Symptom monitoring in pediatric oncology using patient-reported outcomes: why, how, and where next. *Patient.* 2018;11(2):147-53. doi: 10.1007/s40271-017-0279-z
- Buljan D, Kranjčec I, Pavić I, Krnjaić P, Šalig S, Jakovljević G, Stepan Giljević J. Invasive fungal infections in children treated for hematologic malignancies – a five-year single center experience. *Acta Clin Croat.* 2022 Dec;61(4):647-54. doi: 10.20471/acc.2022.61.04.11.
- Tarakcioglu Çelik HG. Onkoloji hemşireliğinde semptom yönetimi. *Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi.* 2016;5(4):93-100. (in Turkish)
- Tariman JD, Szubski KL. The evolving role of the nurse during the cancer treatment decision-making process: a literature review. *Clin J Oncol Nurs.* 2015;19(5):548-56. doi: 10.1188/15.CJON.548-556
- DeWalt DA, Gross HE, Gipson DS, Selewski DT, DeWitt EM, Dampier CD, *et al.* PROMIS[®] pediatric self-report scales distinguish subgroups of children within and across six common pediatric chronic health conditions. *Qual Life Res.* 2015 Sep;24(9):2195-208. doi: 10.1007/s11136-015-0953-3.
- Tomlinson D, von Baeyer CL, Stinson JN, Sung L. A systematic review of faces scales for the self-report of pain intensity in children. *Pediatrics.* 2010 Nov;126(5):e1168-98. doi: 10.1542/peds.2010-1609.
- Tomlinson D, Hyslop S, Stein E, Spiegler B, Vettese E, Kuczyński S, *et al.* Development of mini-SSPedi for children 4-7 years of age receiving cancer treatments. *BMC Cancer.* 2019 Jan 8;19(1):32. doi: 10.1186/s12885-018-5210-z.
- Brown TA. Confirmatory factor analysis for applied research. 2nd ed. The Guilford Press; 2015.
- Finch W. Exploratory factor analysis. SAGE Publications Inc; 2020. doi: 10.4135/9781544339900.
- Wong DL, Baker CM. Pain in children: comparison of assessment scales. *Pediatr Nurs.* 1988 Jan-Feb;14(1):9-17. PMID: 3344163
- Hicks CL, von Baeyer CL, Spafford PA, van Korlaar I, Goodenough B. The Faces Pain Scale-Revised: toward a common metric in pediatric pain measurement. *Pain.* 2001 Aug;93(2):173-83. doi: 10.1016/S0304-3959(01)00314-1.
- Saiful M, Yusoff B, Arifin WN, Nurma S, Hadie H. Malaysian association of education in medicine and health sciences. *Educ Med J.* 2019;11(2):45-54. doi: 10.21315/eimj2021.13.1.10
- Watkins WM. Exploratory factor analysis: a guide to best practice. *J Black Psychol.* 2018;44(3):219-46. doi: 10.1177/0095798418771807
- Sarmento R, Costa V. Confirmatory factor analysis – a case study. Cornell University; 2019. doi: 10.48550/arXiv.1905.05598
- Marsh HW, Guo J, Dicke T, Parker PD, Craven RG. Confirmatory factor analysis (CFA), exploratory structural equation modeling (ESEM), and Set-ESEM: optimal balance between goodness of fit and parsimony. *Multivariate Behav Res.* 2020;55(1):102-19. doi: 10.1080/00273171.2019.1602503
- Taber KS. The use of Cronbach's alpha when developing and reporting research instruments in science education. *Res Sci Educ.* 2018;(48):1273-96. doi: 10.1007/s11165-016-9602-2
- DeVellis RF, Thorpe CT. Scale development, theory and applications. 5th ed. SAGE Publication Inc.; 2021.
- Jonhson B, Christensen L. Educational research: Quantitative, qualitative, and mixed approaches. 6th ed. California: SAGE Publication; 2017.
- Senthilnathan S. Usefulness of Correlation Analysis. International Training Institute. 2019. doi: 10.2139/ssrn.3416918.
- Dupuis LL, Johnston DL, Baggott C, Hyslop S, Tomlinson D, Gibson P, *et al.* Validation of the symptom screening in pediatrics tool in children receiving cancer treatments. *J Natl Cancer Inst.* 2018 Jun 1;110(6):661-8. doi: 10.1093/jnci/djx250.
- Tomlinson D, Dupuis LL, Johnston DL, Kuczyński S, Patel S, Schechter T, Vettese E, Mairs M, Tomlinson GA, Sung L. Reliability and validity of proxy-SSPedi and mini-SSPedi in pediatric patients 2-7 years receiving cancer treatments. *BMC Cancer.* 2022 Jul 4;22(1):730. doi: 10.1186/s12885-022-09814-8.
- Polit DF, Beck CT, Owen SV. Focus on research methods: is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Res Nurs Health.* 2007;30(4):459-67. doi: 10.1002/nur.20199
- Boateng GO, Neilands TB, Frongillo EA, Melgar-Quinonez HR, Young SL. Best practices for developing and validating scales for health, social, and behavioral research: a primer. *Front Public Health.* 2018 Jun 11;6:149. doi: 10.3389/fpubh.2018.00149.
- Büyüköztürk Ş. Sosyal bilimler için veri analizi el kitabı: İstatistik, araştırma deseni SPSS uygulamaları ve Yorum. 24. Baskı. Ankara: Pegem Akademi; 2018. (in Turkish)
- Merenda PF. A guide to the proper use of factor analysis in the conduct and reporting of research: pitfalls to avoid. 1997;30(3):156-64. doi: 10.1080/07481756.1997.12068936
- Xia Y, Yang Y. RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: the story they tell depends on the estimation methods. *Behav Res Methods.* 2019 Feb;51(1):409-28. doi: 10.3758/s13428-018-1055-2.
- Nunnally JC, Bernstein IH. Psychometric Theory. 3rd ed. McGraw-Hill; 2010.

Sažetak

TURSKO ISTRAŽIVANJE VALJANOSTI I POUZDANOSTI INSTRUMENTA ZA PROBIR NA SIMPTOME (MINI-SSPedi) KOD DJECE LIJEČENE ZBOG RAKA U DOBI OD 4-7 GODINA

H. Zengin, A. Akdeniz Kudubeş i G. Özalp Gerceker

Cilj ovog istraživanja bio je prilagoditi Instrument za probir na simptome u pedijatriji za tursku djecu s rakom u dobi od 4-7 godina te procijeniti njegovu valjanost i pouzdanost. Ova deskriptivna i metodološka studija provedena je na 159 djece liječene zbog raka od lipnja 2021. do prosinca 2021. godine. Primijenjeni alati za prikupljanje podataka bili su socio-demografski obrazac i Instrument za probir na simptome (*Symptom Screening in Pediatrics Tool*, mini-SSPedi) za djecu u dobi od 4-7 godina. U analizi podataka primijenjeni su Cronbachov alfa, faktorska analiza i analiza stavaka-ukupnog zbroja. Na mini-SSPedi bilo je 15 stavaka i jedna dimenzija. Rezultati eksploratorske faktorske analize pokazali su ukupno faktorsko opterećenje $>0,30$, dok je Kaiser-Meyer-Olkinova vrijednost bila 0,831. Konfirmatorna faktorska analiza pokazala je sljedeće vrijednosti indeksa spremnosti χ^2/sd : 1,739 ($p=0,000$), GFI 0,895, CFI 0,919, TLI 0,897, RMSEA 0,068 i SRMR 0,064. Cronbachov alfa koeficijent za ukupnu ljestvicu bio je 0,846. Korelacija između stavaka i ukupnog zbroja ljestvice kretao se od 0,411 do 0,749. Dakle, utvrđeno je da je mini-SSPedi valjana i pouzdana ljestvica za turski uzorak djece. Mini-SSPedi može doprinijeti određivanju probira na simptome u djece s rakom u dobi od 4-7 godina.

Ključne riječi: *Ljestvica probira na simptome; Djeca; Rak; Valjanost; Pouzdanost*