

## Construct validity and responsiveness of the Persian version of Extended Version of the Knowledge of Parenting Strategies Scale

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### Abstract

**Introduction:** The Persian version of Extended Version of the Knowledge of Parenting Strategies Scale is a tool with appropriate reliability and validity that has been translated and validated in 2022.

**Research Methods:** The present study was performed on a sample of 330 parents (207 mothers and 123 fathers) with the aim of determining the structural validity of this scale. Also, in order to determine the responsiveness of Persian version of KOPSS scores to positive parenting program, a purposive sampling was performed from 15 parents (9 mothers and 6 fathers) in an elementary school. In the form of pre-test and post-test design, a group of these parents was first pre-tested and then the training course was held in the form of five two-hours online sessions. Three weeks after the end of the course, the post-test was performed.

**Results:** The correlation coefficient between the pre-test and post-test scores of the participants was  $r = 0.892$  ( $P < 0.001$ ). After removing two items, the standardized Cronbach's alpha coefficient for the Persian version of KOPSS was calculated to be 0.717. In confirmatory factor analysis, another 11 items were deleted due to poor factor loading. In the final model of KOPSS-20, the indexes of fit were all acceptable. Univariate analysis of covariance revealed that KOPSS-20 is able to respond to the Positive parenting program and the effect size of this difference is at a high level.

**Conclusions:** The present study showed that KOPSS-20 is a tool with the adequate structural validity and is sensitive and responsive to the effects of intervention and parenting education.

**Keywords:** Construct validity, Knowledge of Parenting Strategies, Responsiveness

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## Introduction:

The aim of this study was to determine the construct validity and responsiveness of the Persian version of the revised parenting strategies knowledge scale. Parenting is a complex set of activities that affect a child's development individually or in interaction with each other. These activities include special methods and behaviors that are followed by parents. Each parent interacts with their child or children in a special way, but researchers have also defined and described different parenting styles, which is actually a classification of the types of ways that parents interact with their children. Due to the importance of this issue, various tools have been designed and developed to measure it. One of these tools is the Extended Version of Knowledge of Parenting Strategies Scale (KOPSS). The Persian version of the Extended Version of Knowledge of Parenting Strategies Scale is a reliable and valid tool that was translated and validated in Persian in 2022, and its psychometric properties were examined and 20 items were accepted from it, which from now on we call it KOPSS-20. This tool was designed to measure the parents' knowledge of parenting strategies with children between 3 and 12 years old in 2015 at UNSW University in Australia. The English and Persian versions of this scale have 33 and 20 items, respectively. The main purpose of this scale is to focus on how to deal with behavioral problems of children aged 3 to 12 years (such as persistent aggression, defiance, and breaking the rules). The items of this scale have four options and the participant must choose the correct option among them. There is only one correct answer for each item, and the items are categorized into four areas: 1- Strategies to encourage the child's positive behavior 2- Discipline strategies to limit the child's misbehavior 3- Management of high-risk situations (for example, things outside the home) and conflict with siblings 4- Support strategies for partners and parents' attention to themselves. The positive parenting program has been developed according to the intensity and strength of the intervention in 5 levels and for parents of children and adolescents from birth to 16 years old. The levels of intervention in this program are: "The first level is a public awareness strategy that provides useful information about parenting to all interested parents through the media.", "The second level is a primary health care intervention that provides preventive developmental guidance for parents of children with mild behavioral problems.", "Third level targets children with mild to moderate behavioral problems and includes a model that is individually designed to manage a specific behavior or developmental concern.", "Target children at Fourth level have severe behavioral problems." And "The fifth level is a family behavioral intervention program. This program is for parents who, in addition to parenting problems, have other family problems such as marital conflicts, parental depression, and high levels of stress. ". The logical reason for the leveling of this program is the different level of impairment in children's performance and behavior as well as the various needs of their parents. As this program provides parents with the minimum level of support they need. Sanders and his colleagues in 2003 described this program as brief, cost-effective and with significant effects on the therapist's skills, self-confidence, and satisfaction with the counseling of parents of children with behavioral problems. They have suggested its use at the level of public health and in order to prevent children's psychopathology.

**Research method:**

This research is of a quantitative type that consists of two parts: "Descriptive part and factor analysis" and "Semi-experimental intervention part and checking the responsiveness of the tool". The statistical population of this research consists of Iranian parents with children aged 3 to 12 who have a normal life (living together) in the year 2021. Considering the conditions of the covid-19 pandemic and being in the first and second waves of the corona outbreak and in order to prevent the health of the participants from being at risk, for the Construct validity of the scale we used Purposive sampling through internet method and in the section of Responsiveness of the scale, the Convenience Sampling was used. The criteria for entering the participants in this research were: Being Iranian, being married, having at least one child between the ages of 3 and 12, having a normal married life (being together). Also, the criteria for removing the participants from this research were: Failure to answer at least more than 20% of the items of the Persian version of KOPSS or absence of more than three sessions in the semi-experimental intervention. It should be noted that construct validity emphasizes how well the test measures the theoretical construct or desired attribute. This assessment requires three basic measures: First, the creator of the test must carefully analyze the target attribute. In the next step, consider how the attribute is related to other variables and then find out through testing whether these hypothetical relationships really exist or not. Also, in order to determine the responsiveness of the scores of the Persian version of KOPSS to the positive parenting program in an elementary school, 15 parents (9 mothers and 6 fathers) were sampled through Convenience Sampling. In the form of a pre-test and post-test plan, a group of these parents took a pre-test and then a training course was held in the form of five two-hour online sessions. The interval between each of these meetings was 3 days, and finally after three weeks from the end of the course, the participants were given a post-test. The titles of these sessions are: "Characteristics of a healthy and attractive environment for children and how to provide it", "Principles of creating a positive learning environment", "Correct implementation of firm rules and regulations", "Setting realistic expectations for children in their parents" and "The importance of parents' personal and marital needs along with the needs of the child".

**Results:**

The correlation coefficient between the pre-test and post-test scores of the participants was  $r=0.892$  and at the  $P<0.001$  level. The standardized Cronbach's alpha coefficient for the Persian version of KOPSS was calculated as 0.717 after removing two items. In the confirmatory factor analysis, 11 other items were removed due to weak factor loading. In the final model of KOPSS-20, there are 20 items (see Figure-1) and 13 items (two items in the internal consistency stage and 11 items in the confirmatory factor analysis stage) were removed from its original version. The calculated measurement models fit were all acceptable (see Table-1). To determine the responsiveness of the evaluated tool, univariate analysis of covariance (ANCOVA) was used, which shows that positive parenting program training had a significant effect on parenting strategies in Iranian citizens, and the amount of this effectiveness was 2.60; So that the average score of parenting strategies before

the intervention (11.60) and after the intervention (14.20) was obtained. Also, the effect size was  $\eta=0.643$ , which shows that the difference in society is 65% and at a high level and this indicates that KOPSS-20 has responsiveness to the Triple-P course and the effect size of this difference is at a high level (see Table-2).

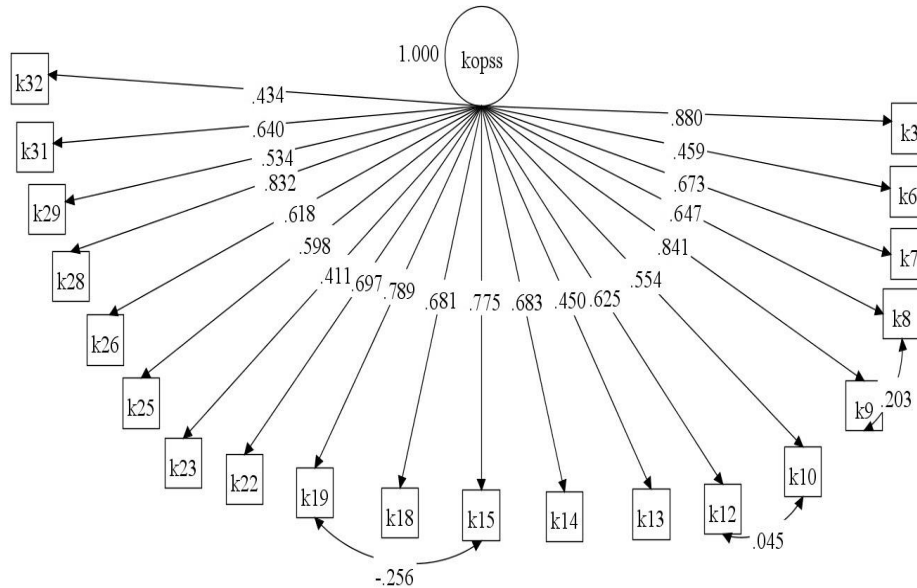


Figure 1. The structure of the Persian version of the Extended Version of Knowledge of Parenting Strategies Scale: the modified model resulting from the first-order confirmatory factor analysis

**Table 1.** The Goodness of fit index of the proposed, modified and final model of the present study for the Persian version of KOPSS

| Goodness of fit index  | $\chi^2$ | df  | p-value | CMIN/df | RMSEA (CI 90%)         | TLI   | WRMR  | CFI   |
|------------------------|----------|-----|---------|---------|------------------------|-------|-------|-------|
| <b>Suggested model</b> | 869.246  | 469 | <0.001  | 1.853   | (0.046-0.056)<br>0.051 | 0.611 | 1.408 | 0.722 |
| <b>Modified model</b>  | 249.595  | 172 | 0.001   | 1.451   | (0.026-0.047)<br>0.037 | 0.885 | 1.001 | 0.889 |
| <b>The final model</b> | 244.051  | 169 | 0.0001  | 1.444   | (0.016-0.039)<br>0.029 | 0.902 | 0.942 | 0.910 |

**Abbreviations:** KOPSS: Knowledge of Parenting Strategies Scale; CFA: confirmatory factor analysis; CMIN/DF: Chi-square/degree-of-freedom ratio; RMSEA: Root Mean Square Error of Approximation; CFI: Comparative Fit Index; TLI: Tucker Lewis Index; WRMR: Weighted Root Mean Square Residual.

**Note:** Fit indices: CFI, TLI (>0.9), RMSEA (<.08), WRMR (<1), CMIN/DF (<3 good, <5 acceptable).

**Table 2.** ANCOVA results to determine the effect of positive parenting program training on the knowledge of parenting strategies (n=15)

| Variable             | Source         | sum of squares | Degrees of freedom | mean square | F      | p-value | Effect size |
|----------------------|----------------|----------------|--------------------|-------------|--------|---------|-------------|
| Parenting strategies | Modified model | 91.606         | 1                  | 91.606      | 23.445 | <0.001  | 0.643       |
|                      | Pre-test       | 91.606         | 1                  | 91.606      | 23.445 | <0.001  |             |
|                      | Error          | 50.794         | 13                 | 3.907       |        |         |             |
|                      | total          | 3167           | 15                 |             |        |         |             |

### Conclusion:

Confirmatory factor analysis was used to check the validity of the designed structure. In the next step, factor loadings less than 0.4 were removed from the model (22) and in the final step to improve the model fit, 3 correlations between the measured errors were drawn. In the proposed model, 11 items numbered 1, 2, 4, 5, 11, 17, 20, 21, 24, 27 and 30 had a factor load less than 0.4. In the first step, these 11 items were removed from the proposed research model, and considering that in the previous study, items 16 and 33 were removed (due to weak internal consistency below 0.70), finally 20 items remained in the model. We call this 20-item version KOPSS-20. The results of the modified model's fit indices also show the acceptable fit of the proposed model with the data. In the second step, to improve the fit of the model, covariance was established between the measurement errors (e8-e9, e10-e12 and e15-e19). In the final model, all goodness of fit index like RMSEA=.029, TLI=.902, WRMR=.942 and CFI=.910 were confirming the appropriate fit of the KOPSS-20 confirmatory model. Also, univariate analysis of covariance (ANCOVA) was used to determine the responsiveness of the evaluated tool. According to the analysis, the F statistic of the modified pattern of parenting strategies was 23.445, which was significant at the 0.001 level. Therefore, positive parenting program training has had an increasing and significant effect on the level of knowledge of parenting strategies in Iranian citizens. In other words, the amount of this difference was 2.60; So that the average score of parenting strategies before the intervention (11.60) and after the intervention (14.20) was obtained. Also, the effect size value was obtained  $\eta^2=0.643$ , which shows that the amount of this difference in society is about 65% and at a high

level (Cohen, 1988). These results confirm that KOPSS-20 has a suitable responsiveness. On the other hand, Kirkman (2018) conducted a similar study in Australia on the 16-item version of the KOPSS, in order to improve the parenting knowledge scores of clinical or online interventions for fathers and mothers separately and the results of ANOVA mixed models analyzes showed that regardless of the type of intervention, with the passage of time, the scores of both groups of mothers (mean pre-test 8.39 to post-test 13.18) and fathers (mean pre-test 8.42 to post-test 12.19) In the post-test phase increases compared to the pre-test ( $P < 0.001$ ). Eta square was 0.67 for the group of mothers and 0.74 for the group of fathers. These results were generally the same as the findings of the present study, i.e. the improvement of KOPSS-20 scores in the post-test stage compared to the pre-test and obtaining an Eta square of 0.64. According to the results of the confirmatory factor analysis that was used to measure the construct validity of the KOPSS scale, 11 items were removed, and due to the removal of two items in the process of measuring psychometric properties and standardization before this study, the number of items in the Persian version of KOPSS It reached 20 numbers, which we call KOPSS-20, and all goodness of fit index like RMSEA=.029, TLI=.902, WRMR=.942 and CFI=.910 confirmed the appropriate fit of the KOPSS-20 confirmatory model. Also, the results of univariate analysis of covariance (ANCOVA) and the obtained effect size confirm that KOPSS-20 has a suitable responsiveness. Therefore, it can be stated that KOPSS-20 has adequate construct validity and responsiveness and can be used in future research and clinical applications.