

Translation and psychometric properties of the Dutch Parental Stress Scale

Marieke M. van der Knoop¹, Lisette J. Schmidt², Billy Jansson¹

¹Mid Sweden University

²Vrije Universiteit Amsterdam

mariekevanderknoop@outlook.com

Copyright. 2017–2023. Psychreg Journal of Psychology

An open access initiative by Psychreg Ltd

ISSN: 2515-138X



The Parental Stress Scale (PSS) is an 18-item self-report-scale that quickly measures perceived parental stress through positive and negative aspects of parenthood. This study aimed to establish a Dutch version of the PSS and to examine its psychometric properties. The original questionnaire in English was translated into Dutch, via forward-backward translation. Participants were approached via various online forums and comprised a random sample of parents with at least one child under the age of 19 living at home. The Dutch translation of the PSS and the Opvoedingsbelasting Vragenlijst (Parenting burdening Questionnaire, OBVL) were completed by 198 participants through a web-based platform. Analyses showed good reliability of the translated PSS. Confirmatory factor analysis indicated a 15-item model consisting of two factors (“parental stress” and “parental satisfaction”). PSS total scores strongly correlated with OBVL total scores, as did both individual factors of the PSS with (most of) the OBVL subscales, supporting construct validity. However, the “Parental satisfaction” factor had >50% of the variance due to error, which may pose a concern with regard to convergent validity. The Dutch translation of the PSS is a 15-item questionnaire that measures perceived parental stress and may pose a more comprehensive, freely available, alternative for the OBVL.

Keywords: Dutch translation; Parental Stress Scale; PSS; psychometric properties; translation

In everyday life we all have to deal with stress at times. One of the most commonly used definitions for the concept of stress is the definition of Lazarus (1966). Lazarus describes that stress occurs when individuals discover that they are no longer able to deal with the demands placed on them or that they can no longer deal with the threats to their well-being. Stress can be experienced both positively and negatively.

Parenting can be stressful at times, particularly when there are additional stressors in daily life. There are all kinds of different stressors, such as having debts or relational problems, but also for example chronic illness in a parent or child or raising a child with intellectual and/or physical disabilities. Parental stress is a type of stress that can be experienced by parents. Parental stress results from an imbalance between what parenting requires from parents and what parents can exert in their parenting role. This concern resources, skills and protective factors (Abidin, 1992; Anthony et al., 2005; Costa et al., 2006; Deater-Deckard, 1998; Morgan et al., 2002; Williford et al., 2007). Everyday struggles that parents experience as stressful are more strongly associated with parenting stress than major stressful life events (Coplan et al., 2003). When stressors accumulate, there can be negative consequences for the quality of parenthood and the relationship between parent and child.

How parents perceive their child's behaviour and the sense of competence in parenthood are essential elements regarding parental stress (Deater-Deckard & Scarr, 1996). Parents who experience high parental stress may show qualitatively negative parenting (Östberg & Hagekull, 2000; Yates et al., 2010). Parental stress leads to poorer quality of parent-child interaction, which can lead to unsafe attachment of the child (Morgan et al., 2002; Östberg & Hagekull, 2000; Webster-Stratton, 1990). Insecure attachment of the child can in turn indirectly lead to a higher degree of parental stress (van Bakel & Riksen-Walraven, 2002) and this may cause a negative spiral. Furthermore, various studies link parental stress to behavioural problems in children (Barry et al., 2005; Buodo et al., 2013; Campbell et al., 1996; Campbell et al., 2000; Crnic & Greenberg, 1990; Deater-Deckard, 2005; Kazdin & Whitley, 2003; Morgan et al., 2002; Neece et al., 2012; Roelofs et al., 2006; Yates et al., 2010). High parental stress furthermore increases the risk of depression (Cairney et al., 2003). Therefore, it is extremely important to detect high levels of stress in parents at an early stage before this may lead to lasting complaints and problems.

Various questionnaires are available in Dutch to map the degree of parental stress, including the Nijmeegse Ouderlijke Stress Index (NOSI), which is an adaptation of the Parenting Stress Index of Abidin (1983), the abbreviated version of this questionnaire (the NOSI-K), and the Opvoedingsbelasting Vragenlijst (Parenting burdening Questionnaire, OBVL). However, many of these questionnaires require an extensive amount of time from parents to complete and from healthcare providers to score. The NOSI is a questionnaire of 123 items that must be completed by the parent(s) on a six-point scale. The questionnaire consists of 13 subscales and a life events scale. The administration of the questionnaire is possible for children from 2 to approximately 13 years old. It takes approximately 25 minutes to administer the NOSI. The raw scores have yet to be converted into norm scores. There are standard tables for both fathers and mothers, for both a clinical and a non-clinical group. The short version of this questionnaire, the NOSI-K (De Brock et al., 1992) consists of 25 items and covers 10 of the 13 NOSI scales. The scales Social isolation, Marriage relationship and Role restriction are missing. The NOSI has been assessed quite positively by the "Commissie Testaangelegenheden Nederland" (COTAN - translated: test affairs committee in the Netherlands): the reliability is considered satisfactory, and concept validity and criterion validity are considered good. However; the assessment dates back to 1996 (Evers & de Groot, 2000). The COTAN judges the norms of the NOSI as non-representative and can no longer be used due to aging (Veerman et al., 2014). In addition, costs are associated with the purchase of the NOSI and the NOSI-K. The OBVL consists of 34 items and is therefore shorter than the NOSI. However, the raw scores also have yet to be converted into norm scores, which means that the use of the questionnaire requires extra time from the healthcare provider. The questionnaire is free of charge.

A short questionnaire that is available free of charge to healthcare providers and researchers and that can be used for rapid screening and repeated measurements to map the degree of parental stress, would be a valuable addition to the existing Dutch questionnaires which measure parental stress. The Parental Stress Scale (PSS; Berry & Jones, 1995) lends itself well to these purposes. The PSS is a questionnaire consisting of 18 items, and includes both positive components of parenthood (emotional benefits, self-enrichment, personal development) and negative components (demands on resources, opportunity costs and restrictions). The questionnaire uses a Likert scale, ranging from

one to five: (1) strongly disagree, (2) disagree, (3) undecided, (4) agree, and (5) strongly agree. There are 8 “positive”; items and 10 “negative”; items. In scoring the questionnaire, the score on the 8 “positive” items is reversed. The total score can vary between 18 and 90 points. The higher the score, the higher the perceived parental stress. The questionnaire can be completed in a few minutes and therefore gives little burden on parents. Because the raw scores are not converted into norm scores, administering the questionnaire also requires little time from healthcare providers. The questionnaire is intended for both fathers and mothers as well as other primary caregivers of both children with and without clinical problems. The original English version of the Parental Stress Scale showed adequate levels of internal reliability (Cronbach’s alpha = .83) and test-retest reliability (.81) (Berry & Jones, 1995).

The original language of the questionnaire is English, but the questionnaire has already been translated into several languages. To our knowledge, there are two Chinese versions (Cheung, 2000; Leung & Tsang, 2010), and translations into Danish (Pontoppidan et al., 2018), Gujarati (Patel et al., 2016), Brazilian-Portuguese (De Brito & Faro, 2017), Spanish (Oronoz et al., 2007) and Urdu (Ali et al., 2012). Cheung (2000) included 257 Chinese parents in the study. This study excluded one of the 18 items and the 17-item scale showed high internal consistency (.892). Data was further analysed using principal component analyses, which showed two factors: parental strain and parental satisfaction. Leung and Tsang (2010) included 162 parents recruited through primary schools and 38 parents with children with attention deficit hyperactivity disorder (ADHD) in their study. Data was examined using Rasch analysis and the researchers identified a reduced 16-item scale with 5 categories as unidimensional, with a person reliability of .86. Pontoppidan and colleagues (2018) included 1110 mothers of children aged 0 to 12 months and examined the psychometric properties of the Danish version by also using Rasch models. The researchers suggest excluding two items and state that the PSS consists of two separate unidimensional subscales measuring parental stress (PS) and lack of parental satisfaction (LPS). In the Gujarati translation by Patel and colleagues (2016) also no items were excluded. Reliability as measured by Cronbach’s alpha for the Gujarati scale was calculated 0.924. Cronbach’s alpha based on standardized items was found .921. De Brito and Faro (2017) included 304 parents in their study to develop a Brazilian-Portuguese version of the PSS. Data was examined using exploratory factor analysis, which indicated a final structure for the PSS composed of 16 items divided into two subscales. Cronbach’s alpha was reported to be .60 and .79 for the two subscales. Oronoz and colleagues (2007) investigated a sample of 211 first-time parents to develop a Spanish translation. One item was excluded, resulting in a 17-item questionnaire.

Data was examined by also using exploratory factor analysis. The researchers found a two-factor solution that accounted for 33.5% of the variance, with the two factors being Stressors and Parenting Rewards. Cronbach’s alpha was reported to be .76 and .77 for the two subscales. The Urdu version of the PSS translated by Ali and colleagues (2012) contains 19 items. Cronbach’s alpha was reported to be .73 for the Urdu version, as mentioned in a study by Nadeem and colleagues (2016).

This study aims to establish a Dutch version of the parental stress scale and to examine its psychometric properties. The dimensionality of the PSS will first be examined by using exploratory factor analysis (EFA). We expected to find a two-factor structure, based on previous research (Oronoz et al. 2007; Cheung, 2000; de Brito & Faro, 2017). A confirmatory factor analysis (CFA) will be performed to verify the factor structure of the PSS. In order to test construct validity, correlations between the PSS and the OBVL will be calculated.

METHOD

Participants

Two-hundred participants took part in the study, of which two did not complete the questionnaires and were excluded from further analyses. Of the remaining 198 participants, 70.2% were female. The mean age of the participants was 40.07 (min = 21, max = 58, *SD* = 7.62). Their highest completed education was higher professional education or university bachelor’s degree (52.5%), university master’s degree or PhD (23.7%), post-secondary vocational education (21.7%), secondary education (1%), or unspecified (1%). All participants had at least one child under the age of 19 living at home. The number of children of the participants was 1 (28.8%), 2 (53.3%), 3 (14.1%), or 4 (3.5%), with an average age of 8 years (mode = 2, median = 11). Their family composition was couple with children (84.3%), single parent (10.1%), or co parent (5.6%).

Instruments

Dutch version of the Parental Stress Scale. The first step in this study was to translate the original English questionnaire into Dutch. A bilingual translator who was fluent in Dutch and English, has translated the questionnaire from English to Dutch. Subsequently, another bilingual translator, who was also fluent in Dutch and English, translated the questionnaire back from Dutch to English. This second translator did not have knowledge of English version of the scale in advance. Some differences in words have been adjusted in the Dutch version after this forward-backward translation in consultation with both translators.

The Dutch translation was then distributed to a group of healthcare professionals within various settings, where they were asked whether the questionnaire was clear to them and with the aim of clarifying any misinterpretations or ambiguities. This included not only the clarity of the items, but also the clarity of the instructions for both completing and scoring the questionnaire. Subsequently, a definitive Dutch translation of the questionnaire was established in consultation with the group of healthcare professionals and both translators (Supplemental Table 1).

Opvoedingsbelasting Vragenlijst (translated: Parenting burdening Questionnaire). In addition to the Dutch translation of the PSS, respondents also completed a second questionnaire: The "Opvoedingsbelasting Vragenlijst" (OBVL) (Veerman et al., 2014; Vermulst et al., 2012). This second questionnaire was added to measure the construct validity of the Dutch translation of the Parental Stress Scale. The OBVL measures the perceived parenting tax and is filled in by parents about one child on the basis of a 4-point Likert scale, score 1 "does not apply", 2 "applies a little", 3 "applies properly" and 4 "applies completely".

The total questionnaire consists of 34 items, divided into five scales: "Problemen opvoeder-kind relatie" (Problems educator-child relationship - 6 items), "Problemen met opvoeden" (Problems with parenting - 7 items), "Depressieve stemmingen" (Depressed moods - 7 items), "Rolbeperking" (Role limitation - 6 items) and "Gezondheidsklachten" (Health complaints - 8 items). Based on the scores on all items, a sum score can be calculated for each parent that gives an impression of the burdening that a parent experience. The higher the final score, the more parenting burdening parents experience. Research showed good construct validity good and sufficient to good internal consistency. The Cronbach's alpha for the scales varies between .74 and .87 and between .89 to .91 for the total questionnaire (Veerman et al., 2014). Norm tables are based on three norm groups: 0 to 3 years ($N = 484$), 4 to 11 years ($N = 364$) and 12 to 18 years ($N = 580$) (Vermulst et al., 2012). In the present sample, reliability analysis showed that reliability of the PSS scale was good, Cronbach's alpha = .87.

PROCEDURE

Qualtrics Survey Software (www.qualtrics.com) was used for the distribution of the questionnaires as well as for the data collection. The questionnaires were distributed to parents and guardians. A wide group of respondents was approached. Parents/guardians of children aged 0-18 years were approached via various online forums for parents/ about parenting and parenting / nurturing questions, and via the researchers own professional network and social media network. By recruiting via various forums, both parents/ guardians of children with and without clinical symptoms could participate in the study. Parents were asked to participate, by using a post that described the purpose of the study and which included a link to an online survey-form to complete the questionnaires. The survey-form also included an accompanying cover letter stating that all data could be completed anonymously. This letter also addressed the purpose of the study and included contact information of the lead investigator. Demographic questions were added regarding age, gender and number of children of the participant, and age of the child(ren). The survey-form furthermore included a notification for informed consent.

Data analyses

First, the dimensionality of the PSS was examined by using an EFA using principal axis factoring as extraction method, since we assume factor scores to be estimates of the underlying latent constructs. Since some degree of correlation between factors was expected, oblique rotation was applied. Parallel analysis method was used to determine the number of dimensions of the PSS. Since several

psychometric studies on the translation of the PSS into other languages revealed a two-factor structure (Cheung, 2000; de Brito & Faro, 2017; Oronoz et al., 2007), we expected to find a two-factor structure here too. Subsequently, we performed CFA to verify the factor structure of the PSS. To account for some minor departure from normality of the data and the ordinal nature of the data, maximum likelihood estimation with robust standard errors with Satorra-Bentler scaled test statistics (Satorra & Bentler, 2001) were used. Goodness-of-fit of the model was evaluated using chi square statistics (χ^2), Comparative Fit Index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardised root mean square residual (SRMR). With respect to the CFI and TLI, values above .95 indicate a good fit, and values above .90 suggest an adequate fit. SRMR values around .08 or lower indicates a good fit to the data. As for the RMSEA, values below .06 are considered a good fit, and values below .08 suggest an adequate fit (Hu & Bentler, 1999). Two more indices to identify the best fitting solution was used: the Akaike's Information Criterion (AIC) and Bayes Information Criterion (BIC) indices (the smallest AIC and BIC values indicating the best fitting model).

Next, measurement invariance tests were conducted across age groups (younger/equal to 40 years; older than 40 years) using a sequential strategy testing the invariance at different levels. A sequential strategy was used to test the invariance at different levels. In the first (configural) model, all parameters were freely estimated across groups, in order to establish equivalence in factor structure across the two groups. Second, a metric model was fitted, in which the factor loadings were constrained to be equal. The fit of this model was compared to the configural model. Third, a scalar model was fitted, in which factor loadings and item intercepts were constrained to be equal. This fit was compared to the second (metric) model. Fourth, a strict model was fitted, in which factor loadings, intercepts, and residual variances were constrained to be equal. This model was compared to the third (scalar) model. Following recommendations by Chen (2007), we used $\Delta\text{RMSEA} \leq .015$ and $\Delta\text{CFI} \leq -.010$ for the evaluation of the fit of the successive models with increasingly stringent constraints. According to Chen (2007), CFI should be considered the main criterion, since RMSEA tends to over reject an invariant model when sample size is smaller. For the final model, Composite Reliability (CR) was used as measure of internal consistency of the factors, where values greater than .70 are indicative of good reliability. Discriminant validity is achieved when average variance extracted (AVE) is greater than maximum shared squared variance (MSV). For convergent validity, AVE should be equal or greater than .50 and lower than CR. Put differently, variance explained by the construct should be greater than measurement error and greater than cross-loadings.

Finally, in order to test construct validity, Pearson correlations between the PSS and the OBVL were calculated. Correlations larger than .40 indicate a moderate correlation, and correlations larger than .60 indicate a strong correlation. The CFAs were carried out using the R (R Core Team, 2018) package lavaan (Rosseel, 2012). All other statistical analyses were performed using JASP version 0.14.1 (JASP Team, 2020).

RESULTS

Preliminary analyses

On average, participants scored 39.30 ($SD = 9.53$, min = 18, max = 69) on the PSS scale. There was a significant difference between PSS scores of males ($M = 36.14$, $SD = 9.09$) and females ($M = 40.65$, $SD = 9.43$), $t(196) = 3.11$, $p = .002$, Cohen's $d = .48$). There was a significant positive correlation between PSS score and age of parent ($r = .20$, $p = .005$). Correlations between PSS score and number of children ($r = .05$, $p = .467$), and PSS score and education level of parent ($r = -.006$, $p = .934$) were not significant.

Mean OBVL scores were 54.95 ($SD = 14.10$, min = 34, max = 104) for the total sample, with females scoring higher than males (M diff = 5.10, SD diff = 2.17; $t(196) = 2.36$, $p = .019$).

Exploratory factor analysis

The parallel analysis revealed that conform our expectation, the model seemed to consist of two factors. Table 1 shows the initial extraction of two common factors. The obliquely rotated factor loadings are shown in Table 1. The factor loadings indicate that items 3, 4, 9, 10, 11, 12, 13, 15, and 16 load on Factor 1, and items 1, 2, 5, 6, 7, 8, 14, 17, and 18 load on Factor 2. However, the loading of item

2 (“There is little or nothing I wouldn’t do for my child(ren) if it was necessary”) was low ($<.30$). The two factors accounted for 38.5% of the explained variance. The correlation between the two factors was .53, indicating that the factors are somewhat correlated, and that the oblique solution was appropriate.

Table 1
 Pattern matrix of factor loadings of the obliquely rotated principal axis factoring analysis with two factors

Item	Factor 1	Factor 2
1	.193	.613
2	.003	.297
3	.611	.107
4	.469	.082
5	-.104	.566
6	.063	.703
7	-.233	.712
8	.005	.476
9	.705	.036
10	.752	-.113
11	.381	.044
12	.692	-.129
13	.542	.274
14	.1982	.366
15	.539	.218
16	.631	.078
17	.225	.551
18	.152	.603

Confirmatory factor analysis

CFAs were performed with one and two factors, respectively. Table 2 shows the model-fit indices for the models. While the fit for the one-factor model was poor, the fit of the two-factor model was good according to the RMSEA and SRMR (both < .08), and the CFI and TLI showed acceptable model fit. Factor loadings of the two-factor model are shown in Table 3. Since factor loadings of items 2, 5, and 7 were low, an additional CFA was run for a two-factor model excluding these items, resulting in 15 instead of 18 items. The model fits for this 15-item two-factor model were further improved, with the CFI and the TLI now approaching close model fit. AIC and BIC were smallest for the 15-item two-factor model which also indicates that this model has the best fit.

Table 2
 Estimates of confirmatory factor analyses: Model-fit indices for a one-factor, two-factor and a modified model

Model	χ^2 (df)	CFA	TLI	RMSEA	SRMR	AIC	BIC
One-factor	359.26 (135)	.756	.723	.092	.092	8413.30	8531.67
Two-factor	222.61 (134)	.904	.890	.058	.071	8263.50	8385.16
Two-factor (15 item)	133.33 (89)	.941	.930	.057	.061	7254.32	7356.26

Note: χ^2 = Satorra-Bentler scaled Chi-square (df = degrees of freedom); CFI = Comparative Fit Index; TLI = Tucker-Lewis index; RMSEA = Root Mean Square Error of Approximation and 90% confidence interval; SRMR = Standardised Root Mean Square Residual; AIC = Akaike's Information Criterion; BIC = Bayes Information Criterion. **Bold indicates the best fitting factor solution.**

Table 3
 Factor loadings of PSS items for CFA of the two-factor model

Item	Parental Stress	Parental satisfaction	Item (Dutch)	Item (English)
3	0.810		De zorg voor mijn kind(eren) kost soms meer tijd en energie dan ik kan opbrengen.	Caring for my child(ren) sometimes takes more time and energy than I have to give.
4	0.605		Ik vraag mij soms af of ik wel voldoende voor mijn kind(eren) doe.	I sometimes worry whether I am doing enough for my child(ren).
9	0.865		Mijn kind(eren) is/zijn de grootste bron van stress in mijn leven.	The major source of stress in my life is my child(ren).
10	0.741		Het feit dat ik (een) kind(eren) heb, heeft als gevolg dat ik weinig tijd heb en weinig flexibel kan zijn in mijn leven.	Having child(ren) leaves little time and flexibility in my life.
11	0.468		Het hebben van (een) kind(eren) is een financiële last	Having child(ren) has been a financial burden.
12	0.663		Door mijn kind(eren) is het moeilijk om verschillende verantwoordelijkheden in evenwicht te brengen.	It is difficult to balance different responsibilities because of my child(ren).
13	0.792		Het gedrag van mijn kind(eren) is vaak gênant of stressvol voor me.	The behaviour of my child(ren) is often embarrassing or stressful to me.
15	0.672		Ik word overweldigd door de verantwoordelijkheden die het ouderschap met zich meebrengt.	I feel overwhelmed by the responsibility of being a parent.
16	0.699		Een gevolg van het feit dat ik (een) kind(eren) heb, is dat ik nog weinig keuzes in, en invloed heb op mijn eigen leven.	Having child(ren) has meant having too few choices and too little control over my life.
1		0.475	Ik ben gelukkig in mijn rol als ouder.	I am happy in my role as a parent
2*		0.181	Er is weinig of niets dat ik niet zou doen voor mijn kind(eren) als dat nodig zou zijn.	There is little or nothing I wouldn't do for my child(ren) if it was necessary.
5*		0.292	Ik voel me nauw verbonden met mijn kind(eren).	I feel close to my child(ren).
6		0.429	Ik breng graag tijd door met mijn kind(eren).	I enjoy spending time with my child(ren).
7*		0.277	Mijn kind(eren) is/zijn voor mij een belangrijke bron van affectie.	My child(ren) is an important source of affection for me.
8		0.460	Het feit dat ik (een) kind(eren) heb, geeft me een meer zekere en optimistische kijk op de toekomst.	Having child(ren) gives me a more certain and optimistic view for the future.
14		0.402	Als ik opnieuw de keuze zou kunnen maken, zou ik misschien besluiten geen kind (eren) te krijgen.	If I had it to do over again, I might decide not to have child(ren).
17		0.581	Ik ben tevreden als ouder.	I am satisfied as a parent.
18		0.432	Ik geniet van mijn kind(eren).	I find my child(ren) enjoyable

*Item not included in final 15 item scale

Measurement invariance tests were conducted to test invariance across two age groups (≤ 40 years vs. > 40 years) regarding the 15-item model. The analyses (see Table 4 for estimates) showed support for configural invariance (suggesting a similar factor structure across the two age groups). There was no substantial decrease the model fit in the metric model, indicating that full metric invariance was achieved (i.e., the strength of the relationship between the items and constructs is the same across groups). Even though the change in RMSEA suggested full scalar invariance, the invariance exceeded the criteria for invariance based on change in CFI.

However, based on the estimated change in model fit if the parameter were freely estimated, partial scalar invariance can be achieved by removing equality constraint (releasing one constraint at the

time). Partial invariance was achieved by releasing the constraint for one intercept (Item 9). Similarly, with respect to residual invariance, the invariance exceeded the criteria for invariance based on change in CFI, but partial invariance was achieved by releasing the constraints for two residuals (Item 9 and 13).

Table 4
 Results of the multi-group tests of invariance for age. The deltas represent the change in relation to the previous level of measurement invariance

Model	χ^2 (df)	CFI	Δ CFI	RMSEA	Δ RMSEA
Configural	276.50 (178)	.877	–	.075	–
Metric	285.67 (191)	.882	.005	.071	.004
Scalar	313.77 (204)	.863	–.019	.074	.003
Partial scalar (freed Item 9)	310.64 (203)	.866	–.016	.073	.002
Residual	353.71 (218)	.831	–.035	.079	.006
Partial residual (freed Item 13)	339.56 (217)	.847	–.019	.076	.003
Partial residual (freed Items 9+13)	334.05 (216)	.853	–.011	.074	.001

Note: Estimates for χ^2 , CFI and RMSEA are based on Satorra-Bentler scaled Chi-square statistics

Validity

Regarding the reliability and the factorial validity (i.e., convergent and discriminant) of the final model, Table 5 shows that CR indices indicated a good reliability for the two factors (all above .70). However, indices of convergent validity still indicated validity concerns for the parental satisfaction factor (AVE < .50). The index of discriminant validity indicated good validity.

Table 5
 Indicators of internal consistency and validity (and factor correlations) for the six-factor structure

Scale	CR	AVE	MSV	1
1. Parental stress	.788	.505	.413	–
2. Parental satisfaction	.622	.218	.413	.682

Note: CR = Composite Reliability; AVE = Average Variance Extracted; MSV = Maximum Shared squared variance

In order to assess construct validity, scores on the 15-item PSS were compared to OBVL scores (Veerman et al., 2014; Vermulst et al., 2012) in the same sample. Correlations between PSS scores and OBVL scores are shown in Table 6. The correlation between PSS and OBVL total score was strong (.82). Correlations between Factor 1 of the model and all OBVL subscales were moderate to strong. In addition, Factor 2 of the model showed strong correlations with OBVL subscales “Problems with educator-child relationship”, “Problems with parenting” and “Depressed moods”.

A hierarchical regression analysis was performed in order to rule out the possibility that the correlation between PSS score and OBVL score was caused by the common variance shared with gender, age, education level, and number of children. The model with the four demographic variables and PSS as independent variables explained more variance in OBVL score than the model with just the demographic variables ($\Delta R^2 = .61$, F change (1,192) = 363.46, $p < .001$), indicating that the PSS score was directly related to the OBVL score.

Table 6.
 Pearson Correlations between factors of the PSS and subscales of the OBVL

	PSS Factor 1	PSS Factor 2	ProbE	ProbP	DeprM	RoleL	Health	PSS total	OBVL total
PSS Factor 1	1								
PSS Factor 2	.535**	1							
ProbE	.562**	.695**	1						
ProbP	.554**	.613**	.775**	1					
DeprM	.592**	.633**	.740**	.655**	1				
RoleL	.686**	.280**	.356**	.304**	.383**	1			
Health	.534**	.423**	.497**	.414**	.635**	.453**	1		
PSS total	.933**	.754**	.682**	.661**	.693**	.617**	.559**	1	
OBVL total	.745**	.665**	.844**	.796**	.863**	.656**	.766**	.821**	1

** Correlation is significant at the .01 level (2-tailed).

DISCUSSION

This study developed and validated a Dutch version of the PSS through forward-backward translation of the original English version and consecutive factor analyses. The final model yielded a two-factor solution with 15 items in total, that showed strong correlation with the OBVL, which is the widely used standard to measure parental stress in the Netherlands. When an EFA was performed, the parallel analysis revealed (as expected) that the model consists of two factors. A two-factor model covering both the positive and negative aspects of parenting is supported by the authors of the original questionnaire (Berry & Jones, 1995) as well as by several other translation studies (Cheung, 2000; de Brito & Faro, 2017; Oronoz et al., 2007; Pontoppidan et al., 2018,). When CFAs were performed with one and two factors, respectively, analyses indicated that the two-factor model fits better than the one-factor model. Since factor loadings of items 2, 5, and 7 were low, an additional CFA was run for a two-factor model excluding these items, resulting in 15 instead of 18 items. The results indicated that the 15-item model fits better than the original 18-item model. The final Dutch translation of the questionnaire therefore consists of 15 items. Also, in other translations of the PSS several items have been excluded, although these items slightly differed between studies. Item 2 was excluded by several other studies (Cheung, 2000; De Brito & Faro, 2017; Pontoppidan et al., 2018). Leung and Tsang (2010) used the version of Cheung (2000) in their study, but also excluded item 10. Pontoppidan and colleagues (2018) excluded item 11. De Brito and Faro (2017) excluded item 4. Oronoz and colleagues (2007) excluded item 16. Patel and colleagues (2016) excluded no items. Interestingly, the Urdu version of scale contains 19 items instead of 18 (Ali et al., 2012). The variance between the different translations as to which items are excluded may be explained by the fact that some items cannot be clearly described in that specific language, resulting in a lack of clarity about the content of the item.

Clarity could potentially be different for each item, depending on what language an item is being translated into. Pontoppidan and colleagues (2018) described that these differences furthermore might stem from cross-cultural differences in family affluence, from culturally determined perceptions of whether children can be seen as a financial burden or other related differences. It is notable in this study that the three items with a low factor loading all load on the factor that measures the positive aspects of parenting. Interestingly, Leung and Tsang (2010) found that a number of PSS items were endorsed by very few participants and these were also items that measure the positive aspects of parenting. Their explanation was that the respondents may regard responsibility for children as a duty, but that they less easily endorse enjoyment of the parent-child relationship.

Another explanation the researchers described is that parents may tend to be more sensitive to the negative aspects than to positive aspects of parenting.

The reduction of items did not solve the issues with convergent validity, as the AVE failed to reach the acceptable level of 0.5 for the parental satisfaction factor. Inspection of the remaining loadings indicated that further modifications (by removing weak loadings) are not sufficient to improve the AVE to acceptable level. Thus, while the indicators for the parental stress factor were able to capture a high degree of the variance, this was not the case for the parental satisfaction factor. In addition, in cases where the factor loadings were reported for the two-factor models in other validation studies, there seems to be some concerns with convergent validity in these too. That is, for the Cheung study (2000), we calculated AVEs of .47 (stress) and .52 (satisfaction), and AVEs of .33 (stress) and .44 (satisfaction) in the Oronoz et al. study (2007). When the final model was tested for invariance across age cohorts, there were some concerns with respect to scalar and residual invariance. Partial invariance was achieved by allowing Item 9 (“The major source of stress in my life is my child(ren)”) and Item 13 (“The behaviour of my child(ren) is often embarrassing or stressful to me”) from the parental stress factor being freely estimated across groups. As evidence for scalar invariance is necessary to establish that mean differences between groups are due to differences in the latent underlying construct rather than to differences that vary from item to item, caution in comparing mean levels of factors is warranted. In practice, invariance is often not supported for all indicators, and this may be particularly true for complex models with many indicators.

In order to assess construct validity, PSS scores were compared to OBVL scores (Veerman et al., 2014; Vermulst et al., 2012) in the same sample. The results showed strong correlations between PSS and OBVL total score, moderate to strong correlations between Factor 1 of the model and all OBVL subscales and strong correlations between Factor 2 of the model with OBVL subscales “Problems with educator-child relationship”, “Problems with parenting” and “Depressed moods”. A hierarchical regression analysis with the four demographic variables and PSS as independent variable indicated that the PSS score was directly related to the OBVL score. These results show that the Dutch translation of the PSS with 15 items is indeed suitable for measuring perceived parental stress. Interestingly, a positive correlation between the PSS and age of the parents was found, and future studies should further explore this finding.

A broad group of participants was approached in this study. This may have included parents of healthy children, but also parents of children who need extra care or support. The design of the study did not allow to further characterise these aspects. Therefore, it was not impossible to perform sub-analyses or statistical corrections for this feature, which may pose a limitation to the extendibility of the study findings. In addition, the risk of selection bias should be considered. Parents who are already experiencing more parental stress may be more inclined to participate in the study or to end up via google search on the forums where the request for participation was posted. Recommendations for further research would be to study the use of the Dutch translation of the PSS in clinical samples, for instance children with developmental and/or physical disabilities, behaviour problems or children with specific syndromes or illnesses (Pinto-Coelho & Relajo, 2017). It might also be of added value to study the use of the Dutch translation of the PSS in parents with risk factors such as mental health problems or substance abuse problems. This could shed more light on whether the Dutch translation of the PSS is suitable for both clinical and non-clinical use. The translated PSS was completed by 198 parents which is generally considered as an adequate sample size. Although the recruitment strategy aimed to target a diverse group of parents’ representative for the normal population, subjects with a relatively high educational background were over-represented. This can be explained by the fact that many participants were recruited via the researcher’s own network, both professional and via social media network. Yet, the absence of a positive correlation between the PSS and education may suggest that this may not affect the outcomes of this study.

In conclusion, this study provides a validated Dutch translation of the PSS, consisting of 15 items. The PSS is shorter than the current existing questionnaires in the Netherlands that measure parental stress, making it less burdensome for parents and healthcare providers. It also has the advantage of being a public domain questionnaire. Being readily available to care providers as well as to researchers, the PSS may be an effective tool in early detection of parental stress and the monitoring of the effectiveness of interventions and therewith contribute to evidence-based practice. However, there is a need for more empirical work that investigate the convergent validity of the Dutch translation of the PSS.

REFERENCES

- Abidin, R. R. (Ed.), (1983). Parenting stress index manual. Pediatric Psychology Press.
<https://doi.org/10.1093/jpepsy/10.2.169>
- Abidin, R. R. (1992). The determinants of parenting behaviour. *Journal of Clinical Child Psychology* 21, 407–412. https://doi.org/10.1207/s15374424jccp2104_12
- Ali, S. Sabih, F., Jehan, S., Anwar, M. & Javed, S. (2012). Psychological distress and coping strategies among parents of Beta-Thalassemia major patients. *International Conference on Clean and Green Energy* 27, 124–128.
- Anthony, L. G., Anthony, B. J., Glanville, D. N., Naiman, D. Q., Waanders, C. & Shaffer, S. (2005). The relationship between parenting stress, parenting behaviour and pre-schoolers social competence and behaviour problems in the classroom. *Infant and Child Development* 14, 133–154. <https://doi.org/10.1002/icd.385>
- Barry, T. D., Dunlap, S. T., Cotten, S. J., Lochman, J. E., & Wells, K. C. (2005). The influence of maternal stress and distress on disruptive behaviour problems in boys. *Journal of the American Academy of Child & Adolescent Psychiatry*, 44(3), 265–273. <https://doi.org/10.1097/00004583-200503000-00011>
- Berry, J. O., & Jones, W. H. (1995). The Parental Stress Scale: Initial psychometric evidence. *Journal of Social and Personal Relationships*, 12(3), 463–472. <https://doi.org/10.1177/0265407595123009>
- Buodo, G., Moscardino, U., Scrimin, S., Altoe, G., & Palomba, D. (2013). Parenting stress and externalizing behaviour symptoms in children: The impact of emotional reactivity. *Child Psychiatry and Human Development*, 44, 786–797. [10.1007/s10578-013-0371-0](https://doi.org/10.1007/s10578-013-0371-0)
- Cairney, J., Boyle, M., Offord, D. R., & Racine, Y. (2003). Stress, social support and depression in single and married mothers. *Social Psychiatry and Psychiatric Epidemiology*, 38, 442–449. <https://doi.org/10.1007/s00127-003-0661-0>
- Campbell, S. B., Pierce, E. W., Moore, G., Marakovitz, S., & Newby, K., (1996). Boys' externalizing problems at elementary school: Pathways from early behaviour problems, maternal control, and family stress. *Development and Psychopathology* 8, 701–720.
- Campbell, S. B., Shaw, D. S., & Gilliom, M. (2000). Early externalizing behaviour problems: Toddlers and preschoolers at risk for later maladjustment. *Development and Psychopathology*, 12, 467–488. <https://psycnet.apa.org/doi/10.1017/S0954579400003114>
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, 14(3), 464–504. <https://psycnet.apa.org/doi/10.1080/10705510701301834>
- Cheung, S.K. (2000). Psychometric properties of the Chinese version of the Parental Stress Scale. *Psychologia*, 43(4):253–261.
- Coplan, R. J., Bowker, A., & Cooper, S. M. (2003). Parenting daily hassles, child temperament, and social adjustment in preschool. *Early Childhood Research Quarterly*, 18(3), 376–395. [https://psycnet.apa.org/doi/10.1016/S0885-2006\(03\)00045-0](https://psycnet.apa.org/doi/10.1016/S0885-2006(03)00045-0)
- Costa, N. M., Weems, C. F., Pellerin, K., & Dalton, R. (2006). Parenting stress and child psychopathology: An examination of specificity to internalizing and externalizing symptoms. *Journal of Psychopathology and Behavioural Assessment*, 28, 113–122.
- Crnic, K. A., & Greenberg, M. T. (1990). Minor parenting stresses with young children. *Child Development*, 61(5), 1628–1637. <https://doi.org/10.1111/j.1467-8624.1990.tb02889.x>
- de Brito, A. & Faro, A. (2017). Diferenças por sexo, adaptação e validação da Escala de Estresse Parental [Differences by gender, adaptation and validation of the Parental Stress Scale]. *Avaliação Psicológica*, 16(1), 38–47. <https://psycnet.apa.org/doi/10.15689/ap.2017.1601.05>
- De Brock, A. J. L. L., Vermulst, A. A., Gerris, J. R. M., & Abidin, R. R. (1992). NOSI – Nijmeegse Ouderlijke Stress Index, Handleiding experimentele versie [NOSI–Nijmegen Parenting Stress Index, Manual experimental version]. Lisse, Swets en Zeitlinger.
- Deater-Deckard, K. (2005). Parenting stress and children's development: Introduction to the special issue. *Infant and Child Development*, 14, 111–115. <https://psycnet.apa.org/doi/10.1002/icd.383>
- Deater-Deckard, K. (1998). Parenting stress and child adjustment: Some old hypotheses and new questions. *Clinical Psychology: Science and Practice* 5, 314–332. <https://psycnet.apa.org/doi/10.1111/j.1468-2850.1998.tb00152.x>

- Deater-Deckard, K., & Scarr, S. (1996). Parenting stress among dual-earner mother and fathers: Are there gender differences? *Journal of Family Psychology*, 1, 45–59.
<https://psycnet.apa.org/doi/10.1037/0893-3200.10.1.45>
- Evers, A., van Vliet-Mulder, J. C., & Groot, C. J. (2000). Documentatie van tests en testresearch in Nederland. Koninklijke Van Gorcum BV.
- Hu, L. & Bentler, P. M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55 JASP Team (2020). JASP (Version 0.13.0) [Computer software].
<http://dx.doi.org/10.1080/10705519909540118>
- Kazdin, A. E., & Whitley, M. K. (2003). Treatment of parental stress to enhance therapeutic change among children referred for aggressive and antisocial behaviour. *Journal of Consulting and Clinical Psychology*, 71, 504–515. <https://psycnet.apa.org/doi/10.1037/0022-006X.71.3.504>
- Lazarus, R. S. (1966). Psychological stress and the coping process. McGraw-Hill.
- Leung, C. & Tsang, S.K.M. (2010). The Chinese Parental Stress Scale: Psychometric evidence using Rasch modelling on clinical and nonclinical samples. *Journal of Personality Assessment*, 92(1), 26–34. <https://doi.org/10.1080/00223890903379209>
- Morgan, J., Robinson, D., & Aldridge, J. (2002). Parenting stress and externalizing child behaviour. *Child and Family Social Work*, 7, 219–225. <https://psycnet.apa.org/doi/10.1046/j.1365-2206.2002.00242.x>
- Nadeem, M., Choudhary, F.R., Parveen, A. & Javaid, F. (2016). Parental stress among parents of children with and without disabilities. *Pakistan Journal of Social Sciences* 36(2), 1281–1289.
<https://pjss.bzu.edu.pk/index.php/pjss/article/view/509>
- Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behaviour problems: A transactional relationship across time. *American Journal on Intellectual and Developmental Disabilities*, 117, 48–66. <https://doi.org/10.1352%2F1944-7558-117.1.48>
- Oronoz B, Alonso-Arbiol I, Balluerka N. (2007). A Spanish adaptation of the Parental Stress Scale. *Psicothema* 19, 687–692.
- Östberg, M. & Hagekull, B. (2000). A structural modeling approach to the understanding of parenting stress. *Journal of Clinical Child Psychology*, 29, 615–625.
https://psycnet.apa.org/doi/10.1207/S15374424JCCP2904_13
- Patel, M.J., Patel, P.B. & Bansal, R.K. (2016). Parental Stress Scale: Translation and preliminary testing for a Gujarati Sample. *National Journal of Community Medicine* 7(7), 551–554.
- Pinto-Coelho, A. & Relojo, D. (2017). Overview of utilisation of mental health services in Portugal. *Journal of Innovation in Psychology, Education and Didactics*, 21(1), 57–68. <https://doi.org/fkht>
- Pontoppidan, M., Nielsen, T. & Kristensen, I.H. (2018). Psychometric properties of the Danish Parental Stress Scale: Rasch analysis in a sample of mothers with infants. *PLoS ONE* 13(11), e0205662. <https://doi.org/10.1371%2Fjournal.pone.0205662>
- R Core Team (2018). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org>
- Roelofs, J., Meesters, C., Ter Huurne, M., Bamelis, L., & Muris, P. (2006). On the links between attachment style, parental rearing behaviours, and internalizing and externalizing problems in non-clinical children. *Journal of Child and Family Studies*, 15, 331–344.
<http://dx.doi.org/10.1007/s10826-006-9025-1>
- Rossee, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software*, 48(2), 1–36. URL <http://www.jstatsoft.org/v48/i02/>
- Satorra, A. & Bentler, P. M. (2001) A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika* 66, 507–14. <https://doi.org/10.1007/BF02296192>
- van Bakel, H. J. A. & Riksen-Walraven, J. M. (2002). Parenting and development of one-year olds: Links with parental. Contextual and child characteristics. *Child Development* 73, 256–273.
<https://psycnet.apa.org/doi/10.1111/1467-8624.00404>
- Veerman, J. W., Kroes, G., De Meyer, R. E., Nguyen, L. M., & Vermulst, A. A. (2014). Opvoedingsbelasting in kaart gebracht. Een kennismaking met de Opvoedingsbelastingvragenlijst (OBVL). *JGZ Tijdschrift voor jeugdgezondheidszorg*, 46(3), 51–55.
- Vermulst, A.A., Kroes, G., De Meyer, R. E., Nguyen, L.M. & Veerman, J. W. (2012). Opvoedbelastingvragenlijst (OBVL). Handleiding. Nijmegen: Praktikon.
- Webster-Stratton, C. (1990). Stress: A potential disruptor of parenting perception and family interaction. *Journal of Clinical Child Psychology*, 19, 302–312.
https://psycnet.apa.org/doi/10.1207/s15374424jccp1904_2

- Williford, A. P., Calkins, S. D., & Keane, S. P. (2007). Predicting change in parenting stress across early childhood: Child and maternal factors. *Journal of Abnormal Child Psychology*, 35, 251–263. <https://psycnet.apa.org/doi/10.1007/s10802-006-9082-3>
- Yates, T. M., Obradović, J., & Egeland, B. (2010). Transactional relations across contextual strain, parenting quality, and early childhood regulation and adaption in a high-risk sample. *Developmental and Psychopathology*, 22, 539–555. <https://doi.org/10.1017/S095457941000026X>

Parental Stress Scale – Nederlandse versie

De volgende uitspraken beschrijven gevoelens en percepties over de ervaring van het zijn van ouder. Bedenk bij elk van de uitspraken hoe uw relatie met uw kind of kinderen gewoonlijk is. Geef aan in welke mate u het eens of oneens bent met de volgende uitspraken door het meest passende nummer in de daarvoor bestemde ruimte te plaatsen.

1 = Helemaal niet mee eens 2 = Niet mee eens 3 = Neutraal 4 = Mee eens 5 = Helemaal mee eens

-
- 1 Ik ben gelukkig in mijn rol als ouder.
 - 2 De zorg voor mijn kind(eren) kost soms meer tijd en energie dan ik kan opbrengen.
 - 3 Ik vraag mij soms af of ik wel voldoende voor mijn kind(eren) doe.
 - 4 Ik breng graag tijd door met mijn kind(eren).
 - 5 Het feit dat ik (een) kind(eren) heb, geeft me een meer zekere en optimistische kijk op de toekomst.
 - 6 Mijn kind(eren) is/zijn de grootste bron van stress in mijn leven.
 - 7 Het feit dat ik (een) kind(eren) heb, heeft als gevolg dat ik weinig tijd heb en weinig flexibel kan zijn in mijn leven.
 - 8 Het hebben van (een) kind(eren) is een financiële last.
 - 9 Door mijn kind(eren) is het moeilijk om verschillende verantwoordelijkheden in evenwicht te brengen.
 - 10 Het gedrag van mijn kind(eren) is vaak gênant of stressvol voor me.
 - 11 Als ik opnieuw de keuze zou kunnen maken, zou ik misschien besluiten geen kind (eren) te krijgen.
 - 12 Ik word overweldigd door de verantwoordelijkheden die het ouderschap met zich meebrengt.
 - 13 Een gevolg van het feit dat ik (een) kind(eren) heb, is dat ik nog weinig keuzes in, en invloed heb op mijn eigen leven.
 - 14 Ik ben tevreden als ouder.
 - 15 Ik geniet van mijn kind(eren).
-

Scoren

Om de ouderlijke stressscore te berekenen, dienen items 1, 4, 5, 14 en 15 als volgt omgekeerd te worden gescoord: (1 = 5) (2 = 4) (3 = 3) (4 = 2) (5 = 1).

De itemscores worden vervolgens opgeteld.

De schaal scoren:

We beogen dat een lage score een laag stressniveau aangeeft en een hoge score een hoog stressniveau

- Mogelijke totaalscores vallen binnen het schaalbereik van 15–75.
- Hoe hoger de score, hoe hoger het gemeten niveau van ouderlijke stress.

Gebruik een eenvoudige tabel om de voor/na resultaten weer te geven en aan te tonen of een interventie een positief effect heeft gehad.

- Vergelijking van individuele voor/na of longitudinale totaalscores op de ouderlijke stressschaal.
- Vergelijking van gemiddelde voor/na scores van groepen (ouders/verzorgers die deelnemen aan specifieke interventies/groepssessies, diensten of voorzieningen).