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The Pregnancy Obsession-Compulsion-Personality Disorder Symptom Checklist

Van Broekhoven K[1], Hartman E[1], Spek V[1], Bergink V[2], van Son M[3], Karreman A[1] and Pop V[1]*

[1]Department of Medical and Clinical Psychology, Tilburg University, Tilburg, The Netherlands
[2]Department of Psychiatry, Erasmus MC, University Medical Center, Rotterdam, The Netherlands
[3]Department of Clinical Psychology, University of Utrecht, Utrecht, The Netherlands

Abstract

Background: Up until now, very little research has been undertaken on the possible role of personality traits, such as perfectionism and obsessive compulsive personality disorder (OCPD), on pregnancy distress. This is possibly due to the fact that no appropriate instruments are available for use during pregnancy. The current study was undertaken to develop self-rating instruments for assessing symptoms of OCPD (including perfectionism) during gestation, and to evaluate the relationship between high scores on these scales and (recurrent) depression.

Method: In a large unselected sample of 1095 pregnant women, the Clinical Perfectionism Scale was adapted and modified to fit into a 15-item perfectionism scale. At the same time, ten questions taken from the SCID OCPD structural interview were modified to fit into a separate self-rating scale. The sample was randomly split into two equal sub-samples: Group I was used for reliability and Explorative Factor Analysis (EFA), and Group II for Confirmative Factor Analysis (CFA). The Edinburgh Depression Scale (EDS), completed at 12, 22 and 32 weeks' gestation was used to assess concurrent and discriminant validity.

Results: A seven-item perfectionism (Eigenvalue: 3.6, 52% explained variance) and seven-item OCPD (Eigenvalue: 3, 40% explained variance) symptom check list retained good psychometric properties: Cronbach's alpha of 0.85 and 0.78, respectively, and good CFA model fit: a CFI of 0.96, NFI of 0.95, TLI of 0.97, and RMSEA of 0.05, with a lower limit of 0.04; and CFI of 0.97, NFI of 0.97, TLI of 0.98, and RMSEA of 0.05 with a lower limit of 0.03, respectively. Both scales correlated significantly with EDS scores at different trimesters (r: 0.32-0.43). Significantly more often, women with high scores on these scales (defined as a score of >1 SD>mean) reported single and recurrent episodes of depression during gestation and a previous history of depression earlier in life.

Conclusion: Self-rating scales that assess OCPD trait symptoms are able to detect women at risk for (recurrent) depression during pregnancy.

Keywords: OCPD; Perfectionism; Construct validation; Pregnancy; Depression

Introduction

In perinatal research, concepts of depression and anxiety are frequently studied in relation to maternal and infant health outcome [1,2]. However, the possible impact of personality traits on health outcome is currently being overlooked. It is obvious that personality characteristics that may hamper a woman's adaptation process to biological and social ante- and postpartum changes, carry the risk of distress. The most common (3-8%) personality disorder in the general population [3-7] is Obsessive-Compulsive Personality Disorder (OCPD), which became a diagnosable disorder after the publication of the first Diagnostic and Statistical Manual for Mental Disorders [8]. OCPD is characterized by the following eight personality traits: perfectionism, over-conscientiousness, preoccupation with details, miserliness, rigidity and stubbornness, excessive devotion to work and productivity, inability to discard worthless objects, and inability to delegate tasks [9].

It is obvious that, in the light of the physiological and psychosocial changes inherent in pregnancy and postpartum, women with OCPD (symptoms) may be at risk for increased levels of distress. To the best of our knowledge, to date, no perinatal research has focused on the occurrence and implications of OCPD (symptoms) in pregnant and postpartum women. This can partly be explained by the absence of appropriate tools for assessing OCPD symptoms during pregnancy.

Therefore, the aim of the current study was to develop and investigate the psychometric properties of user-friendly questionnaires in order to assess the symptoms of Perfectionism/OCPD during pregnancy. We hypothesized that the scores on these questionnaires correlate with depression (concurrent validity), and also that the scores on these scales will be able to differentiate between pregnant women with single and those with recurrent episodes of depression during gestation and/or earlier in life (discriminant validity).

Materials and Method

Participants

As part of the large Happy study [10], women who visited their independent community midwife at the first trimester during the first 12 months of the inclusion period (April 2013–2014, N=1,347) were invited to participate in the current study. At 12, 22 and 32 weeks of pregnancy, these women were asked to complete several questionnaires

***Corresponding author:** Pop V, Department of Medical and Clinical Psychology, Tilburg University, Warandelaan 2, PO Box 90153, 5000 LE Tilburg, The Netherlands, Tel: +31 13 466 4259; E-mail: v.j.m.pop@uvt.nl

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[10]. The inclusion criterion was a singleton pregnancy. Exclusion criteria were: twin pregnancies, being of a race other than Caucasian, being unable to read or understand Dutch sufficiently, preterm birth (delivery at <37 weeks' gestation), women with a known history of a severe psychiatric disorder who were referred to a special outpatient policlinic for psychiatric pregnant patients (bipolar depression, personality disorder), and women with a previous diagnosis of a chronic condition (e.g. diabetes-type-I, thyroid disorder). Twelve hundred and eighty-seven women were eligible, 1145 (89%) of whom returned the questionnaires. Incomplete data were submitted by 50 women, which left a sample of 1095 women suitable for data analysis. Using SPSS, these 1095 participants were randomly divided into two subsamples. Data from sample I (N=549) were used to conduct an exploratory factor analysis (EFA) and reliability analysis, and from sample II (N=546) to perform a confirmatory factor analysis (CFA). Both samples met the criteria of four to ten subjects per item with a minimum of 100 subjects to conduct factor analyses [11] (Table 1).

The study was approved by the Medical Ethics Committee of the Máxima Medical Centre, Veldhoven, the Netherlands.

Measurements

Perfectionism scale: The 12-item Clinical Perfectionism Questionnaire (CPQ) [12] was translated into Dutch after being modified in two ways. Firstly, instead of questions being asked, we rewrote the items to form statements, which is more common in personality questionnaires. For example: the first original item: 'Have you pushed yourself really hard to meet your goals?'" was transformed into: ''I push myself really hard to meet my goals". Secondly, contrary to the CPQ in which questions refer to the preceding month, we asked the women to complete statements referring to how they apply to them in general. We feel that aspects referring to personality traits should be asked by adding the qualification "in general". Moreover, the CPQ contains an item (number 10) that uses the word ''perfectionist". This item was omitted because we did not want to bias respondents' answers by revealing the purpose of the questionnaire. Subsequently, four items from the 35-item Multidimensional Frost Perfectionism scale (MFPS; [13]) were added: items 10 and 21 which refer to the dimension "concern over mistakes", and items 12 and 14 which refer to the dimension "personal standards". In all, this resulted in a 15-item perfectionism self-rating scale. The women were asked whether the statements applied to them in general using the following four-point Likert answer scale: never, seldom, often, or always. The questionnaire was then translated back into English by a native speaker and adapted until the questionnaires became identical. This 15-item self-rating scale was completed at 22 weeks' gestation.

Obsession compulsion personality trait symptoms check list: We rewrote the questions from the OCPD SCID interview [14] into statements to be used in a ten-item self-rating questionnaire. However, we omitted items on perfectionism (which was extensively assessed in the CPQ) as well as those on miserliness and morality/religion, since we felt that these were less relevant to the perinatal period. Once again, the women were asked whether the statements applied to them in general, answering on a similar four–point answer Likert scale: never, seldom, often, and always. This OCPD questionnaire was completed at 32 weeks' gestation.

Depressive symptoms: Depressive symptoms were assessed at 12, 22 and 32 weeks' gestation using the Edinburgh Depression scale (EDS). This ten-item questionnaire was previously validated for use during the postpartum [15] and pregnancy [16]. During gestation, a cut-off of 11 at the first trimester and of 10 at the second and third trimesters has earlier been described [16]. The EDS has been extensively used in perinatal research in over 40 countries and has shown good psychometric properties. Total scores range from 0 to 30, with the higher scores indicating greater depressive symptoms.

Baseline characteristics: At 12 weeks, several baseline parameters were evaluated, including demographic, life-style, and obstetric and psychological characteristics, including previous episodes of depression earlier in life (Table 1).

Statistical methods

Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS version 20, IBM, Chicago, IL, USA). Parallel Analysis was performed using the MonteCarlo PA program [17]. Confirmatory factor analysis was carried out using AMOS (version 18, IBM, Chicago, IL, USA).

Factor analyses

A principal component explorative factor analysis (EFA) with oblimin rotation in sample I was performed on both 15-item Perfectionism and 10-item OCPD scales for testing psychometric properties. EFA is a widely utilized and broadly applied statistical technique in the social sciences for the development of an instrument. For factor (or dimension) retention, the Kaiser criterion (all factors with Eigenvalues greater than one) was used. Moreover, a Catell scree plot was used to further select factors for retention. The scree test involves examining the Eigenvalues graph and searching for the natural bending or breaking point in the data where the curve flattens out. The number of data points above the "break" (i.e., not including the point at which the break occurs) is usually the number of factors to retain [18]. Parallel Analysis was also performed to randomly generate a data matrix with criterion values corresponding to the Eigenvalues from the EFA. Parallel Analysis is a method for determining the number

Characteristics	Sample I (*N*=549)			Sample II (*N*=546)		
	N	%	Mn (SD)	N	%	Mn (SD)
Demographics						
Age			30.3 (3.5)			30.1 (3.4)
Living with partner	542	98.7		535	98	
Educational level						
Low	170	31		158	29	
Medium	17	3		22	4	
High	362	66		355	65	
Paid employment	511	93		502	92	
Life style features						
Smoking	258	4.7		27	4.9	
Alcohol intake	231	4.2		22	4.1	
BMI	362	66	23.7 (3.9)			23.4 (3.8)
Previous history of miscarriage	137	25		131	24	
Unplanned pregnancy	37	6.8		38	7	
Psychiatric life-history						
Previous episode of depression	79	14.3		76	13.9	
Previous episode of other mental problems (anxiety, surmenage)	142	25.8		143	26.2	

Table 1: Characteristics of two samples of women participating in the Happy study for construct validation (*N*=1095).

of components or factors to retain from factor analysis by creating a random dataset with the same numbers of observations and variables as the original data. A correlation matrix is computed from the randomly generated dataset and then Eigenvalues of the correlation matrix are computed. When the Eigenvalues from the random data are larger than those from the factor analysis, these factors are considered as mostly "random noise" [17]. Therefore, only Eigenvalues that exceeded the corresponding criterion values were retained [19]. Factor loadings >0.40 were considered important. Items that loaded on more than two factors were retained when the difference was at least 0.20. As explained by Pallant [19], a sub-scale of less than three items is not advisable. Internal consistency analyses were conducted using Cronbach's alpha for the total scale and possible subscales derived from factor analysis. A Cronbach alpha reliability statistic of ≥ 0.70 is considered the minimum acceptable criterion for instrument internal reliability [11]. EFA was repeated in sample II to verify the factor structure found in sample I.

In sample II, CFA was performed on the (remaining) items from the (second) versions of the Perfectionism and OCPD scales. CFA is used to study the relationships between a set of observed variables (factor structures found with EFA) and a set of continuous latent variables, in order to assess the comparative fit index (CFI), normed fit index (NFI), Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA). The objective of CFA is to test whether the data fit a hypothesized measurement model (for example, based on previous EFA). Adequate model fit can be assumed with a CFI ≥ 0.80, combined with an NFI ≥ 0.80, TLI ≥ 0.80, and an RMSEA ≤ 0.05 for a good and ≤ 0.08 for an adequate fit [20,21].

Concurrent and construct validity

To test for differences in characteristics between the two sub-samples, χ^2 analyses were used for all dichotomous data. Differences in mean scores between samples I and II were analyzed using the t-test (two-tailed). Thereafter, data from the two samples were merged in order to determine the concurrent and construct validity. Concurrent validity of the Perfectionism and OCPD scales was tested by correlating these scales with the EDS (Pearson's r correlations, two-tailed). Construct validity was examined by testing hypotheses according to co-morbid correlation between depression and Perfectionism/OCPD symptoms, as explained in detail below. Differences in mean between groups were analyzed using one-way analyses of variance (ANOVA) with Tukey post hoc analysis. Finally, a repeated measurement GLM ANOVA was performed to compare the patterns of depression scores in groups with high versus low Perfectionism/OCPD scores. The effect sizes were calculated for all analyses. A relationship between two variables with a medium-sized effect or higher is regarded as clinically relevant [22].

Results

Explorative and confirmative factor analysis

Perfectionism scale: Skewness and kurtosis statistics showed that the scores on all 15 items were normally distributed. All assumptions for conducting principal components analysis were met. The Kaiser-Meyer-Oklin value was greater than 0.60 (0.91) and the Bartlett's test of sphericity value was significant ($p<0.001$). EFA with oblimin rotation of the 15-item scale in sample I, suggested three dimensions with Eigenvalues of 5.8, 1.6 and 1.2, respectively, with 54% total explained variance (Table 2a).

However, the final dimension only contained one item. Therefore, EFA was repeated using a two-factor structure (Table 2a). This resulted in a two-dimension scale with Eigenvalues of 5.4 and 1.4, respectively, explaining the 47% of total variance (although the scree plot clearly suggested a one-factor structure). Item 8 did not load and items 6, 13 and 14 did not discriminate between the two factors and, therefore, were omitted. The remaining 11 items consisted of one factor with nine items and one factor with only two items. Parallel Analysis showed two components with Eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same sample size (15 variables x 549). When this two-factor structure was tested using CFA in sample II, a poor model fit was found: CFI 0.72, NFI of 0.74, TLI of 0.77, and RMSEA of 0.12. Therefore, in sample I, the EFA was repeated on the 11-item scale using a one-factor solution. This resulted in a dimension with an Eigenvalue of 4.4, explaining 40% of variance. Items 2 and 11 did not load. The remaining nine-item scale showed a Cronbach's alpha of 0.82, which improved to 0.85 after deleting items 5 and 13. This seven-item one-factor scale (items 1, 3, 4, 7, 10, 12 and 15) was retested using CFA in sample II, and showed an adequate model fit: CFI of 0.96, NFI of 0.95, TLI of 0.97 and RMSEA of 0.05, with a lower limit of 0.04. When

	Factor I	Factor II
Eigenvalue	5.8	1.6
Percentage of variance explained	36%	9.6%
1. I push myself really hard to meet my goals	0.78	
2. I tend to focus on what I achieve, rather than on what I do not achieve		0.72
3. Others tell me that my standards are too high when it comes to meeting my goals	0.79	
4. I feel a failure as a person when I do not succeed in meeting my goals	0.65	0.32
5. Sometimes I am afraid that I might not reach my standards	0.60	0.42
6. Sometimes I raise my standards because I think they are too easy	0.46	0.36
7. I judge myself on the basis of my ability to achieve high standards	0.51	0.27
8. Sometimes I do just enough to get by		0.30
9. I repeatedly check how well I am doing at meeting my standards	0.65	
10. I keep trying to meet my standards even if this means that I miss out on things	0.67	
11. I would rather not be too critical regarding my achievements because I am afraid they might be inadequate		0.45
12. Even if I do something very carefully, I feel it is not enough	0.55	0.40
13. Others will probably appreciate me less if I make a mistake	0.36	0.54
14. If I fall short partially, it is the same thing as falling short completely	0.46	0.50
15. I set my goals higher than others do	0.78	

A cut-off score of item loading of .40 was used and a minimum difference of .20 if an item had two loadings. Total variance explained is 53.9%.

Table 2a: Initial 15-item Perfectionism scale with three-factor solution in PCA factor analysis with varimax rotation in 549 pregnant women (sample I).

this seven-item model was retested using EFA with varimax rotation in sample II, a one-structure was found with an Eigenvalue of 3.6, explaining 52% of total variance (Table 2b). The items were recoded from 1-4 into 0-3 in order to obtain an item range of from 0-3.

As can be seen from Table 2b, the remaining items covered behavioral, cognitive and emotional aspects of perfectionism and are summarized in Appendix A.

OCPD scale: Skewness and kurtosis statistics showed that the scores on all items were normally distributed. All assumptions for conducting principal components analysis were met. The Kaiser-Meyer-Oklin value was >0.60 (i.e., 0.82), and the Bartlett's test of sphericity value was significant (p<0.001). EFA with oblimin rotation of the ten-item OCPD scale in sample I suggested two dimensions with Eigenvalues of 3.5 and 1.2, respectively, explaining 47% of total variance (Table 3a).

Eigenvalue:	**3.6**
Variance explained:	
1. I push myself really hard to meet my goals	
3. Others tell me that my standards are too high when it comes to meeting my goals	52%
4. I feel a failure as a person when I do not succeed in meeting my goals	
7. I judge myself on the basis of my ability to achieve high standards.	
10. I keep trying to meet my standards even if this means that I miss out on things	
12 Even if I do something very carefully, I feel like it is not enough	
15. I set my goals higher than others do	

Table 2b: Final seven-item Perfectionism scale with one-factor solution from factor analysis with varimax rotation in 546 (sample II) pregnant women with appropriate model fit in CFA. (CFI: 0.96, NFI: 0.95, TLI: 0.97, RMSEA:0.05, lower limit: 0.04).

Items 1 and 10 did not discriminate between the two factors, and the second dimension retained three items (the scree-plot clearly suggested a one-factor solution). Parallel Analysis showed two components with Eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same sample size (ten variables x 546). When this two-factor structure was tested using CFA in sample II, a poor model fit was found: CFI 0.71, NFI of 0.72, TLI of 0.74, and RMSEA of 0.14. Therefore, EFA was repeated with the eight-item scale using a one-factor solution explaining 40% variance with an Eigenvalue of 3.2. Cronbach's alpha was 0.77 which increased to 0.78 by deleting item 5. When this seven-item one-factor solution was tested in sample II using CFA, an excellent model fit was found: CFI of 0.97, NFI of 0.97, TLI of 0.98, and RMSEA of 0.05, with a lower limit of 0.03. When this seven-item model (items 2, 3, 4, 6, 7, 8, and 9) was retested in sample II using EFA with varimax rotation, a one-structure was found with an Eigenvalue of 3.0, explaining 43% of total variance (Table 3b). The items were recoded from 1-4 into 0-3 in order to obtain an item range of from 0-3.

As can be seen from Table 3b, in the final seven-item scale, the items relating to "I find it difficult to accept help from others if they do not agree to do things my way", "have a clear opinion about how things should be done and I am not easily dissuaded" and "I find it hard to throw away stuff because it might come in handy some time" did not fit in the final model. The final model is summarized in Appendix B.

Concurrent and construct validity

Since the characteristics of both sub-samples (Table 1) were similar, we merged these two samples together for concurrent and discriminate validity analysis (N=1095). The mean scores (SD) and range of the

	Factor I
Eigenvalue	**3.5**
Percentage of variance explained	34.7%
1 I find it difficult to accept help from others if they do not agree to do things my way	0.35
2. I like to keep a clear overview of the things I am doing or I am someone who is generally organized, orderly, and detail-oriented	
3. I am the type of person who memorizes or writes down various lists and planning schemes	0.26
4. I find it difficult to finish work because I spend a lot of time doing everything as well as possible	0.55
5. I have a clear opinion about how things should be done and I am not easily dissuaded	
6. Often I am so busy with things that need to be done that I do not allow myself time for pleasure/relaxation	0.64
7. I want to be in control of everything and have a hard time when something unexpected intervenes	0.65
8. I become restless and panicky when I feel like I am not in control of everything	0.71
9. I feel useless and worthless when I do not experience control over my own life	0.72
10. I find it hard to throw stuff away because it might come in handy some time	0.54

A cut-off score of item loading of .40 was used and a minimum difference of 0.20 if an item had two loadings. See Appendix for full text of items. Total variance explained is 47%.

Table 3a: Initial ten-item OCPD scale two-factor solution from factor analysis with oblimin rotation in 549 pregnant women (sample I).

	Factor I
Eigenvalue	**3.0**
Percentage of variance explained	43%
2. I like to keep a clear overview of the things I am doing, or I am someone who is generally organized, orderly, and detail-oriented	0.57
3. I am the type of person who memorizes or writes down various lists and planning schemes	0.49
4. I find it difficult to finish work because I spend a lot of time doing everything as well as possible	0.56
6. Often I am so busy with things that need to be done that I do not allow myself time for pleasure/relaxation	0.61
7. I want to be in control of everything and have a hard time when something unexpected intervenes	0.73
8. I become restless and panicky when I feel I am not in control of everything	0.76
9. I feel useless and worthless when I do not experience control over my own life	0.71

Table 3b: Final seven-item OCPD scale with one-factor solution from factor analysis with varimax rotation in 546 women with excellent model fit in CFA (CFI: 0.96, NFI: 0.95, TLI: 0.97, RMSEA: 0.05, lower limit: 0.04) (sample II).

seven-item Perfectionism and OCPD scales and EDS are shown in Table 4, including Pearson correlations between these three scales.

Table 4 shows that the mean EDS scores increased from 4.45 at 12 week's gestation to 5.26 at 22 weeks' gestation, and decreased to 4.96 at 32 weeks' gestation. Moreover, Table 4 shows that the EDS scores correlated significantly (with large-sized effect) with the seven-item Perfectionism scale (r between 0.31 and 0.43) as well as with the seven-item OCPD scale (r between 0.32 and 0.42), while the Perfectionism scale correlated significantly with the OCPD scale (r=0.54). Since the OCPD and Perfectionism scores were normally distributed, we defined a high score on both scales, using a cut-off of one standard deviation above the mean. This was ten for both Perfectionism and OCPD. A GLM-ANOVA repeated measurement can be seen in Figure 1, which compares mean EDS scores at 12, 22 and 32 weeks' gestation between women with high versus low Perfectionism (Figure 1a) and high versus low OCPD scores (Figure 1b), respectively.

As can be seen, women with high scores on the Perfectionism scale had significantly higher mean levels of EDS during gestation compared to women with low perfectionism scores: F=86, p<0.001, partial η^2=0.075 (moderate-sized effect=clinically relevant).

Similarly, Figure 1b shows that women with high OCPD scores had significantly higher mean levels of EDS during gestation compared to women with low OCPD scores: F=142, p<0.001, partial η^2=0.12 (moderate- to large-sized effect=clinically relevant).

The number of women with an EDS score above the cut-off during gestation was calculated in the total sample. This amounted to 10.4%, 15.5% and 14.1% at 12, 22 and 32 weeks' gestation, respectively. In total, 26% of the women were depressed at least once during gestation. Of the women with high perfectionism scores, 43.1% were depressed at least once during gestation, compared to 20.5% of those with low perfectionism scores (χ^2=53, df=1, p<0.001). Moreover, 22.8% of the women with high perfectionism scores reported a previous episode of depression earlier in life, compared to 11.8% of those with a low score (χ^2=17.8, df=1, p<0.001). Similarly, 50.6% of the women with high OCPD scores were depressed at least once during gestation, compared to 19.4% of those with low OCPD scores (χ^2=92, df=1, p<0.001). Of the women with high OCPD scores, 23.2% reported a previous episode of depression versus 12% in the group with lower OCPD scores (χ^2=17.6, df=1, p<0.001). Finally, we were able to define four groups of women: those who were not depressed during gestation (N=810, 74%), those who were only depressed once (N=175, 16%), those who were depressed twice (N=66, 6%), and those who were depressed three times (N=44, 4%), according to the EDS scores. The mean scores of the Perfectionism and OCPD scales for these four groups are shown in Table 5.

As can be seen from Table 5, the mean scores for Perfectionism and OCPD were highest in women with persistent depression (ANOVA:

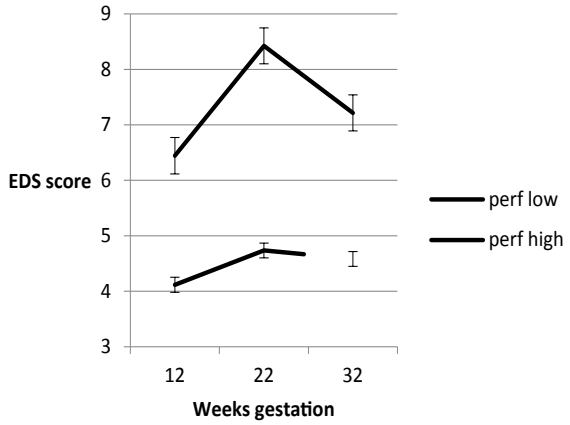

Figure 1a: Mean EDS scores in women with high versus low perfectionism scores (GLM-ANOVA, N=1095).

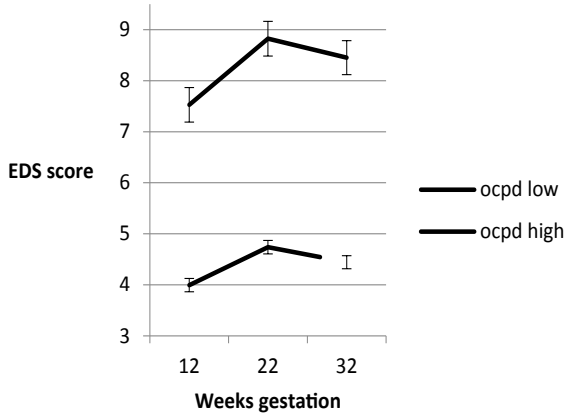

Figure 1b: Mean EDS scores in women with high versus low OCPD scores (GLM-ANOVA, N=1095).

	OCPD	Perfectionism	EDS12	EDS22	EDS32	Mean (SD)
OCPD	1.00	0.54*	0.32*	0.38*	0.42*	7.34 (2.59)
Perfectionism	-	1.00	0.32*	0.43*	0.35*	7.12 (3.08)
EDS12	-	-	1.00	0.59*	0.59*	4.45 (4.21)
EDS22	-	-	-	1.00	0.63*	5.26 (4.28)
EDS32	-	-	-	-	1.00	4.96 (3.73)

Establishment of concurrent validity of the OCPD and Perfectionism scales, by comparing these to the EDS at 12, 22 and 32 weeks, two-tailed, *p<0,001.

Table 4: Correlation matrix including mean scores (SD) and range of OCPD assessed at 32 weeks, Perfectionism assessed at 22 weeks, and EDS scales assessed at each trimester (N=1095).

Depressed:	Persistent, N=44		Once, N=175		Twice, N=66		Not depressed, N=810	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Perfectionism	9.49	(2.26)	8.29	(2.63)	8.83	(2.62)	4.41	(2.12)
OCPD	9.00	(2.69)	8.24	(2.47)	9.12	(2.21)	4.61	(2.11)

Persistent: depression (=EDS score above cut-off) during all trimesters. ANOVA (df=3) Perfectionism: F=39, p<0.001; OCPD: F=46, p<0.001).

Table 5: ANOVA, comparing mean Perfectionism and OCPD scores according to prevalence of depression during gestation (EDS above cut-off).

perfectionism: F=39, p<0.001; OCPD: F=46, p<0.001). Of the 44 women who were depressed three times during gestation, 19 (43%) reported a previous episode of depression earlier in life, compared to 83 (10%) of the 810 who were not depressed during gestation. Of the 19 women with persistent depression during gestation plus a previous episode of depression earlier in life, 13 (68%) and 12 (63%) had a high score on the Perfectionism and OCPD scales, respectively. Of the 727 women who did not suffer from depression during gestation and who had never had an episode of depression earlier in life (810-83), 129 (18%) and 94 (13%) had a high score on the Perfectionism and OCPD scales, respectively (p<0.001).

Discussion

The aim of the current study was to develop Perfectionism and OCPD symptom self-rating scales for use during pregnancy. Our results show that two scales assessing Perfectionism (seven-item) and OCPD (seven-item) symptoms during pregnancy have good psychometric properties: a one-factor structure with good internal consistency and good model fit during the confirmative factor analyses. The correlation between Perfectionism and OCPD scales was significant with a large-sized effect (clinically relevant), showing that there is an overlap between the two scales, but also suggesting that the two scales assess different aspects of psychopathology (R^2=29%). Moreover, there were significant correlations between the EDS scores and Perfectionism and OCPD scores (concurrent validity). Further analysis showed appropriate discriminant validity of the two scales. Women with high scores on both the Perfectionism and OCPD scales were significantly more often depressed at least once during pregnancy, and significantly more often reported a previous episode of depression earlier in life. Also, they had significantly higher mean depressive symptoms scores throughout gestation compared to those with low scores. Finally, the 44 women with recurrent/persistent depression during pregnancy had significantly (and substantially) higher mean Perfectionism and OCPD symptom scores compared to those without depression or with only a single episode of depression during gestation.

With regard to the structure analyses of the newly developed scales, all the assumptions for appropriate factor analyses were met: the sample size was large in both in samples I and II (>10 subjects per item), Cronbach's alphas were >0.70, and the factor loadings of the retaining items were high (>0.40). CFAs showed an appropriate (Perfectionism scale) to excellent (OCPD scale) model fit.

The current sample had similar characteristics to other samples of pregnant women from (previous) studies performed in the same area or in other parts of the Netherlands [16]. The obstetric parameters were similar to those known to the national obstetrics register (The Netherlands Perinatal Registry, PRN) from 2013, with regard to parity, body mass index (BMI), and mean age of the pregnant women. The mean EDS scores were comparable to a large similar sample of women who were also followed three times during pregnancy [16]. Since the OCPD and Perfectionism symptom scales in the current study are among the first to be validated for use in pregnant women, we cannot compare our present findings with those from earlier research. Although several instruments to assess OCPD-related symptoms have been developed and / or used in prior research [23,24], as far as we know, none of these has been specifically developed for, or validated in, a sample of pregnant women.

With regard to specific OCPD traits [9], the items in our final (seven-item) OCPD and Perfectionism symptom questionnaires cover perfectionism, over-conscientiousness, preoccupation with details, rigidity and stubbornness, and excessive devotion to work and productivity. Inability to discard worthless objects and inability to delegate tasks proved to be less relevant to our sample of pregnant women.

The finding in the current study that ''chronicity'' or ''recurrence'' of depression was significantly related to higher mean Perfectionism and OCPD symptom scores is in line with the above-mentioned literature which shows that a lifetime diagnosis of OCPD is quite often related to affective disorders (up to 24%; [6,25]). As was to be expected (depression is a chronic condition), women who reported depression three times during pregnancy also reported the highest number (43%) of previous episodes of depression earlier in life. The current study also showed that, in women who reported a previous episode of depression and persistent depression during gestation, had an almost four to six times higher rate of a high OCPD symptoms score compared to controls (no depression). This is a further argument to support the finding in the literature that women with OCPD symptoms are at particular risk for chronic or recurrent depression, and to suggest that these scales do indeed assess psycho-pathology. It must be taken into account here that women with a known history of a psychiatric disease (including personality disorders) were excluded from the study. This suggests that the results seen in the current study of OCPD symptoms refer to a relatively healthy group of women.

The current study has its strengths and limitations. Its key strength is its large sample size, which enabled us to use different samples for both the EFA and the CFA. Also, the large sample sizes enabled us, with sufficient epidemiological strength, to define different sub-groups of women who were depressed only once or more often during gestation. Another of its strengths was that we repeatedly used the EDS to assess the concurrent validity of our newly developed scales, and used trimester-specific cut-off points for the EDS, as proposed in prior research [16,26]. Our study also has its limitations. The Perfectionism and OCPD symptom scales were not validated against an SCID interview [14]. However, it should be mentioned that, in DSM-5, it is advocated that "the prototype system be expanded to encompass the range of personality syndromes seen in the community and identified empirically" [27]. These authors favor a "clinically grounded prototype approach with a second multidimensional assessment model organized around trait dimensions (rating scales) rather than syndromes" [27]. Future research should assess the appropriate cut-off to calculate the positive predictive value, sensitivity, and specificity of a high score on these scales in predicting the syndromal diagnosis of OCPD, assessed at a structured interview. Another of its limitations was that only Caucasian women were included in the current study, while in the Netherlands, between 10% and 15% of women come from other ethnic groups. This means that the psychometric properties of the two scales should be re-evaluated in pregnant women from other ethnic groups.

The use of Perfectionism/OCPD symptoms scales in clinical perinatal practice would appear to be important. Apart from the decision to conceive, most if not all pregnancy-related changes happen to the pregnant woman (and her partner) and they share one common characteristic: these changes can easily be experienced as a lack of control. It is obvious that coping with such changes will be most difficult for women with OCPD traits. Similarly, during the postpartum period, especially the first 12 months, it is the baby rather than the mother who defines the daily program (feeding/sleeping pattern). Again, it is reasonable to suggest that women with OCPD traits are at risk of experiencing high levels of distress during this period. Therefore, future research should concentrate on the relationship between OCPD traits

and postpartum depression, as well as on infant development because of the impact of pregnancy stress on infant development [28]. Instead of screening for depression during gestation and early postpartum, an alternative could be to screen women with high levels of OCPD symptoms.

Conclusion

In conclusion, the seven-item Pregnancy Perfectionism (P-Perfect) and OCPD (P-OCPD) scales are two simple and easy-to-complete scales with good psychometric properties. The co-morbid characteristics of the high scores of these two scales with (chronicity of) depression suggest that they do indeed assess the psychopathology aspects of OCPD. Since high scores during pregnancy were closely correlated with (chronic/recurrent) depression, we would like to suggest that these instruments could be used to detect women – already during pregnancy – who are vulnerable to postpartum depression.

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