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# Validation of the Edinburgh Postnatal Depression Scale as a screening tool for postpartum depression in a clinical sample in Hungary

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ABSTRACT

*Background:* the purpose of the study was to assess the validity of the 10-item Edinburgh Postnatal Depression Scale (EPDS) in screening for postnatal depression (PND) in Hungary.
*Methods:* between July 2010 and March 2011, a sample of 266 women attending a routine check-up at six weeks *post partum* completed the newly translated Hungarian version of the EPDS at the Department of Obstetrics and Gynecology, University of Szeged, Hungary, and underwent clinical assessments based on the Structured Clinical Interview for DSM-IV disorders (SCID-I).
*Findings:* eight (3.0%) of the mothers were diagnosed with major postnatal depression, and 36 (13.5%) with minor depression on the basis of the SCID. Internal consistency of the Hungarian version of the EPDS was satisfactory (Cronbach $\alpha$ coefficients $\geq 0.727$). The best cut-off for major depression was 12/13, with a sensitivity of 100.0%, and a specificity of 97.7%. The area under the ROC curve was found significant for combined (major+minor) depression as well and at a cut-off of 7/8 indicated a sensitivity of 72.7% and a specificity of 86.0%. A factor analysis suggested multidimensionality with two factors (anxiety and depression).
*Conclusions:* the EPDS showed good validity in the postnatal period in a clinical sample in Hungary.


## Introduction

By definition, postnatal depression (PND) is a non-psychotic depressive episode and can start at any point during the first year postnatal. The symptoms are similar to those in depression at other times. These include low mood and other symptoms lasting at least two weeks. There has been substantial research on PND in both Western and non-Western cultures. Several epidemiological studies reported that 10–15% of mothers suffer from a depressive disorder in the postnatal period (Cox et al., 1993; Andersson et al., 2006).

Maternal psychiatric disorders during the postnatal period are also associated with numerous adverse outcomes in the offspring, including impaired neonatal growth and development (Weinberg and Tronick, 1998; Brand et al., 2006) poor cognitive development and behavior during childhood and even adolescence (Weinberg and Tronick, 1998; O'Connor et al., 2002; Brand et al., 2006), as well as negative nutritional and health effects (Rahman et al., 2004; Barr et al., 2006).

To detect PND, Cox et al. (1987) created a 10-item self-report scale, known as the Edinburgh Postnatal Depression Scale (EPDS). The EPDS was initially validated by Cox et al. (1987) against the Research Diagnostic Criteria (RDC). Since then, the EPDS has been translated into, and validated in, over 30 languages (Gibson et al., 2009). The Hungarian version was translated and validated by our research group in the *antenatal* period (Toreki et al., 2013) and it showed relatively good screening properties for antenatal depression. Another research group had previously validated the EPDS on a nationally representative sample (which is the only example in the EPDS validation literature as far as we are aware); however, they used a self-report symptom rating scale (the Beck Depression Inventory) to assess diagnostic status at six to eight weeks postnatal (Nagy et al., 2011).

Major depression is a mental illness that is often confused with minor depressive disorders but has a different clinical outcome. Both diagnoses require that depressive symptoms cause significant

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social and occupational dysfunction, as specified by DSM-IV (American Psychiatric Association, 1994; First et al., 1997).

Our purpose was to validate the version of the EPDS that we used in our antenatal study for the screening of postnatal depression in a clinical sample of women, in Hungary, using the non-patient version of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID), as the standard criterion for the diagnosis of depression. We also aimed to compare our results to those of the nationally representative data from the Nagy et al. study (2011). We predicted that the EPDS would show excellent sensitivity and specificity for detecting both minor and major PND in the postnatal period. We also predicted good internal consistency for the EPDS. Furthermore, we assumed that the psychometric properties of the EPDS against the SCID will be different from that against the BDI in terms of cut-off scores and receiver operating characteristic (ROC)-analyses. Finally, we wanted to compare the antenatal and postnatal characteristics of the EPDS in ROC analyses.

Our second main objective was to assess the ability of the EPDS to screen for major and combined (major+minor) PND for diagnostic and screening purposes, respectively. Also, we wanted to determine whether the questions could be grouped into underlying latent variables, such as an anxiety and depression subscale, using factor analysis.

## Methods

### *Assessment instrument*

The English version of the EPDS, a 10-item psychometric scale for measuring peripartum depressive symptoms, has been translated into Hungarian and then back translated according to the criteria for cross-cultural equivalence in our previous study. (Toreki et al., 2013). The Hungarian version of the EPDS has proved to be valid in the antenatal period. For this study, the same piloting procedure was carried out. Face, content, semantic and criterion validity of the scale were satisfactory in a Hungarian clinical sample (Toreki et al., 2013).

Our validation process was conducted in the following way: the 10 items of the EPDS were translated from English into Hungarian by a psychiatrist and an obstetrician both being Hungarian-born and living in an English-speaking area. The re-translation of the questionnaire into English was done by a psychologist who was not familiar with the original English version of the EPDS. An English translator did the semantic validation of the re-translated English version and compared it with the original form. We tested the Hungarian version on our study subjects subsequently. They understood the questions and pronounced those unambiguous and not confusing. After all these we considered the translation process to be completed.

### *Study design*

The principal investigator (A.T.) visited the maternity ward on every third day to contact new mothers in the recruitment period that lasted between July 2010 and March 2011. In the first days of the postnatal period, we approached new mothers for consent to a second meeting at the Department of Obstetrics and Gynecology, University of Szeged at six to eight weeks after childbirth. Participants were sent a letter, which explained the purpose of the study, providing the researchers' affiliations and contact information, and clearly stated that answers would be confidential and anonymity would be guaranteed in the final data reports.

The principal investigator checked whether participants met the inclusion criteria which included fluency in spoken and written Hungarian and a signed informed consent. The final sample included 266 mothers who participated in the postnatal validation study.

The postnatal women have participated in the study between the sixth and eighth weeks after childbirth, when we examined their mental health, using the SCID and administering the Hungarian version of the EPDS. The principal investigator (A.T.), who made the diagnosis based on the SCID, blind to the EPDS scores, had obtained training in the use of the SCID and in the diagnosis of major and minor depression. As regards minor depressive symptoms, the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria set reported in the 'Criteria and Axes for Further Studies' (i.e. the presence of depressed mood or loss of interest in activities with at least one but less than four additional symptoms such as guilt feelings, indecisiveness, suicidal ideation, etc.) was adopted. Minor depression was diagnosed with either (1) depressed mood or anhedonia (inability to feel pleasure) and one to three criterion symptoms, or (2) three or more criterion symptoms in the absence of depressed mood or anhedonia, following the same procedure as in our previous paper on AND (Toreki et al., 2013), consistent with other examples in the literature (e.g. Garcia-Esteve et al., 2003).

The study protocol and the questionnaire were approved by the Clinical Research Ethics Committee of the University of Szeged (Date: July 3, 2010, Ref nr.: 49/3/118). The study was carried out according to the principles of the Declaration of Helsinki. Informed consent was obtained from all the subjects (or their legal representatives) recruited into the study. Women identified as in need of psychiatric treatment were referred on for treatment as appropriate.

### *Screening attributes*

#### *Reliability*

Reliability coefficients as measured by Cronbach's $\alpha$ were calculated for the EPDS in order to assess the consistency of the instrument. The internal consistency of the Hungarian EPDS was also tested using Guttman's split-half coefficient (McKennell, 1970). The participants were invited to fill in the EPDS once more, three days after the first screening, and 157 (59%) did so. Repeatability (test–retest reliability) of the EPDS was assessed using intra-class correlation coefficient (ICC). We expected that the ICC for the EPDS items would exceed 0.7 (Anastasia, 1990). The agreement between the EPDS and SCID diagnosis, as measured with the coefficient $\kappa$, was also checked.

### *Factor structure*

The underlying dimensions of the scale were checked with principal components analysis as a usual descriptive method for analysing grouped data (Tabachnick and Fidell, 2007). To determine the dimensional structure of EPDS we used the following criteria: (a) Eigen value $>1$ (Kaiser, 1960); (b) variables should load $>0.50$ on only one factor and on other factors less than 0.40; (c) the interpretation of the factor structure should be meaningful; (d) the Eigen values of the factors retained are above 0.60 in the scree plot (Hakstian et al., 1982). Computations were based on a covariance matrix, as all variables were receiving values from the same measurement scale (Morrison, 1976). Bartlett's test of sphericity with $p<0.05$ and a Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy of over 0.5 were used. As two independent subscales were identified, subsequent Cronbach's $\alpha$'s were separately calculated for each subscale. Additionally, a confirmatory factor analysis of the extracted principal components was conducted by Linear Structural Relations (LISREL) to confirm that the scale items principally load onto the extracted factors and