

## Regional update

# The Parental Bonding Instrument: A psychometric measure to assess parenting practices in the homes in Bangladesh



A.K.M. Rezaul Karim<sup>a,b,c</sup>, Taslima Begum<sup>a,d,\*</sup>

<sup>a</sup> Department of Psychology, University of Dhaka, Dhaka 1000, Bangladesh

<sup>b</sup> Envision Research Institute, 610 N. Main St, Wichita, KS 67203, USA

<sup>c</sup> The Smith-Kettlewell Eye Research Institute, 2318 Fillmore St, San Francisco, CA 94115, USA

<sup>d</sup> BRAC Institute of Educational Development, BRAC University, Dhaka 1212, Bangladesh

## ARTICLE INFO

## Article history:

Received 4 July 2016

Received in revised form 17 November 2016

Accepted 21 November 2016

Available online xxx

## Keywords:

Parental bonding

Care

Over-protection

Cognitive distortion

Validation

EFA

## ABSTRACT

There is growing importance of the Parental Bonding Instrument (PBI) in clinical practice and research on parenting and parental bonding. Since the development of this diagnostic tool (Parker et al., *Brit. J. Med. Psycho.* 1979; 52:1–10), a number of validation studies have been done in various cultures. The aim of the present study was to translate the measure into Bangla and validate in Bangladeshi culture. A total of 200 adolescents participated in the study. Exploratory factor analysis (EFA) of the data from 191 participants (who provided complete responses) identified a two-factor (Care and Overprotection) structure of the PBI with 17 items. The two factors together explained 44.18% of the total variance. The factors showed moderate to very high internal consistency (Cronbach's  $\alpha = 0.863$  for Care; 0.622 for Overprotection), and very strong convergent and discriminant validity as evident by their correlations with the measures of cognitive distortions and antisocial behaviors. In line with the original tool we defined four types of parenting style, such as Affectionate constraint, Affectionless control, Optimal parenting, and Neglectful parenting. This study opens the door of future research on parenting practices and parent-child relationships in Bangladesh.

© 2016 Elsevier B.V. All rights reserved.

## 1. Introduction

Parenting practices has become a great area of interest in recent decades. Good parenting is a necessary precondition for developing good parent-child relationships. Good parenting is typically characterized by the parental ability to sufficiently meet a child's physical (foods, clothes, shelter, medicines), educational (schooling, needed special training), and emotional or psychological (love, affection, nurturance, health care) needs. Good parenting paves the way for both physical and cognitive-emotional development of a child at any age. The failure of good parenting is detrimental to the child's health, survival, development, and dignity. Its effects can become more severe as the child grows older, and encompass multiple areas, including health and physical development, emotional and cognitive development, and psychosocial and behavioral development. A serious form of parenting failure, often termed as child neglect, can be even more harmful on early brain

development than physical or sexual abuse (Garbarino and Collins, 1999). Thus if not prevented or not diagnosed and intervened in a timely manner, child neglect or parental malpractice can have a serious toll on the development of children. In order to identify those victims and design appropriate intervention programs for them, it is necessary to study, measure and examine parenting practices children experience in their homes or families.

One of the widely used psychometric measures of parenting practices is the Parental Bonding Instrument (PBI) developed by Parker et al. (1979). It was designed to measure the contribution of parental behavior to the development of appropriate bonds between parents and children.

As this instrument has a cutoff scores system for both father and mother, it is usable for children with two parents as well as for those with a single parent. PBI retrospectively assesses how respondents were raised and treated by their parents during the first 16 years of their life. It comprises two bipolar factor scales: Care and Overprotection. The 'Care' dimension is composed of care and indifference while the 'Overprotection' dimension is composed of overprotection and autonomy. Based on the two parenting dimensions, Parker et al. (1979) identified four types of parenting styles, high care and low overprotection conceptualized as Optimal

\* Corresponding author at: BRAC Institute of Educational Development, BRAC University, Dhaka 1212, Bangladesh.

E-mail addresses: [karim.akmr.monscho06@gmail.com](mailto:karim.akmr.monscho06@gmail.com) (A.K.M. R. Karim), [shormi7@yahoo.com](mailto:shormi7@yahoo.com) (T. Begum).

parenting, high care and high overprotection conceptualized as Affectionate constraint, low care and high overprotection conceptualized as Affectionless control, and low care and low overprotection conceptualized as Neglectful parenting.

Research has shown that there is a link between clinical or subclinical pathology and the dimensions of parenting practices measured by the PBI (Klimidis et al., 1992). The PBI has been used to examine the relationships between childrearing styles and mental health issues in adulthood, including mood disorders (Avagianou and Zafropoulou, 2008; Handa et al., 2009; Narita et al., 2000; Plantes et al., 1988), anxiety disorders (Arrindell et al., 1989; Yoshida et al., 2005), eating disorders (Canetti et al., 2008; Turner et al., 2005), and personality disorders (Panfilis et al., 2008; Willinger et al., 2005). It has also been used to investigate the associations of parenting styles with parenting stress (Willinger et al., 2005), risk of coronary heart disease (Almeida et al., 2010), and emotional distress in providing care for a parent with dementia (Daire, 2002). Because of its importance in research and clinical practices, a number of validation studies have been attempted on the Australian adolescents (Cubis et al., 1989), Spanish mothers (Gómez-Beneyto et al., 1993), US and UK students (Murphy et al., 1997), US twins families (Kendler et al., 1997), young Pakistani women (Qadir et al., 2005), Japanese family units (Uji et al., 2006), Brazilian Portuguese (Hauck et al., 2006), Turk university students (Kapçı and Küçükler, 2006), Greek population (Tsaousis et al., 2012), Chinese mothers (Liu et al., 2011), and Malay college students (Mahammad et al., 2014). All these studies have shown good reliability and validity of the PBI. However, there is wide variation in its factor structure. Although some studies (Kapçı and Küçükler, 2006; Qadir et al., 2005) supported Parker's original two-factor model, other studies demonstrated superior fit of a three-factor model (Gómez-Beneyto et al., 1993; Cubis et al., 1989; Kendler et al., 1997; Murphy et al., 1997) or a four-factor model (Mahammad et al., 2014; Qadir et al., 2005). Of the three-factor models, Cubis et al.'s (1989) model is a structure of care, protection-personal and protection-social; Gómez-Beneyto et al.'s (1993) model is a structure of care, protection and restraint; Murphy et al.'s (1997) model is a structure of care, denial of psychological autonomy, and encouragement of behavioral freedom; Kendler et al.'s (1997) model and Qadir et al.'s (2005) model are a structure of warmth, protectiveness and authoritarianism; and Mahammad et al.'s (2014) model is a structure of care, autonomy and overprotection. Although the three-factor structure of Gómez-Beneyto et al. (1993) and Qadir et al. (2005) closely resembles the three-factor structure of Cubis et al. (1989), the other three-factor structures (Kendler et al., 1997; Mahammad et al., 2014; Murphy et al., 1997) are widely different from each other. The four-factor models were identified in three studies, and are more consistent than are the three-factor models. For example, Uji et al. (2006) found a structure of care, indifferent, overprotection and autonomy which fits consistently across various age and gender groups. In line with Uji et al.'s (2006) model, Suzuki and Kitamura (2011) and Liu et al. (2011) demonstrated that a four-factor model earned the best fit. Thus it appears that the factor structure of the PBI varies from culture to culture, from study to study, and even in the same study within the same culture (see Qadir et al., 2005). Therefore, it requires a validation study to make the PBI usable in a new culture. Examining factor structure or dimensionality of an instrument in a new culture is important for accurate specifications of theories (Smith and McCarthy, 1995), theory-driven research (Karim and Begum, 2016; Karim and Nigar, 2014) and clinical practice. The specific dimensions can provide a greater detail of the nature of culture-based parenting practices, child care and neglect.

Through parenting practices neglect (low care and low overprotection; see above) occurs to the children of all races,

socioeconomic classes, religions, family structures, and communities. In order to combat and manage this global problem, psychologists, clinicians, mental health professionals, and other social workers have given much attention to the understanding of its nature and socio-cultural roots. However, data from underdeveloped and developing countries are still lacking. Thus parental neglect and its consequences on parent-child relationships and child development have been partially and poorly understood. To fill this gap, it is necessary to conduct objective assessment of parenting practices in under-representative countries like Bangladesh, where parental malpractice in the form of neglect and abuse has been more frequent in recent days than ever before. Though the problem has recently been appearing as one of the main headlines in all daily newspapers it has rarely been studied, examined and reported scientifically. Despite the importance of such a scientific inquiry, till today we do not have any suitable measure to objectively assess parenting practices with the direct involvement of children, the potential victims, in the process. Thus it is necessary to develop a new psychometric tool or validate an existing one within the socio-cultural context of Bangladesh. To this end, we attempt to validate the PBI, because research using this instrument can contribute to parent's education on child rearing practices which can potentially reduce psychopathology in children (Suzuki and Kitamura, 2011). Assessing parenting practices using this tool can particularly be helpful to initiate and design appropriate clinical services and intervention programs for the victims of parental malpractice in Bangladesh.

## 2. Method

### 2.1. Participants

A total of 200 adolescents (girls = 94) voluntarily participated in this study. They were selected purposively from different colleges in Dhaka. At first, four colleges were selected conveniently. From each selected college the 11th grade students attending class were included in the sample. However, because of incomplete responses nine participants (three boys and six girls) were dropped. Among the remaining 191 participants 88 were girls. The age of these participants ranged from 15 to 18 years, with a mean of 16.61 and a standard deviation of 0.614. Participants' self reported data indicate that 3.14% of them came from higher socioeconomic class, 91.62% from middle socioeconomic class, and 5.24% from lower socioeconomic class. All of them were from families with two parents. The educational qualification of their mothers ranged from below secondary school education to Master's degree (89.5% lower education, 8.4% middle education, 1.0% higher education, 1.0% unreported), and that of their fathers ranged from below secondary school education to Ph.D. degree (72.3% lower education, 21.5% middle education, 4.7% higher education, 1.6% unreported).

### 2.2. Measures

#### 2.2.1. The Parental Bonding Instrument

The PBI is a 25-item self-report measure of two parenting styles, Care and Overprotection, which was designed for both mother and father (Parker et al., 1979). The 'Care' subscale comprises 12 items (6 positive, 6 negative) which represent a continuum of parental style from coldness and neglect to affection and emotional warmth. The 'Overprotection' subscale comprises 13 items (7 positive, 6 negative) representing a continuum ranging from independence to control and intrusion. Each of the items is rated on a 4-point scale, ranging from 'very unlikely' to 'very likely'. For a positive item participant's responses are scored as 0=very unlikely, and 3=very likely; for a negative item responses are

scored in reversed fashion. The total 'Care' score ranges between 0 and 36, and the total 'Overprotection' score ranges between 0 and 39. A higher score on the 'Care' subscale indicates higher parental care and a higher score on the 'Overprotection' subscale indicates higher parental control. The combined 'Care' and 'Overprotection' assessments allow parents to be allocated into one of the four categories, such as Affectionless control, Affectionate constraint, Optimal parenting, and Neglectful parenting. Affectionless control equates to low care and high overprotection; Affectionate constraint has high care and high overprotection; Neglectful parenting equates to low care and low overprotection; whereas Optimal parenting has high care and low overprotection (Craissati et al., 2002). The cutoff scores of the mother version 'Care' and 'Overprotection' subscales are 27.0 and 13.5 respectively. The cutoff scores of the father version 'Care' and 'Overprotection' subscales are 24.0 and 12.5 respectively. The original PBI demonstrated high construct validity in correlation with other measures of parental behavior which ranged from 0.69 to 0.85, with a test-retest reliability of 0.63–0.76 (Parker, 1983).

### 2.2.2. The How I Think questionnaire

The Bangla version of the How I Think (HIT) questionnaire (Karim and Begum, 2016) was used to examine the convergent and discriminant validity of the Bangla version PBI (for rationale, see the subsection of validity). The HIT was developed to provide a reliable and valid measure of self-serving cognitive distortions in adolescents (Barriaga and Gibbs, 1996; Barriaga et al., 2001). The original instrument contains 54 6-point Likert items varying from 'totally agree' (1) to 'totally disagree' (6). Of the 54 items, 39 are clustered in four types of cognitive distortions: Self centered, Blaming others, Mislabeling/Minimizing, and Assuming the worst. Each of the 39 items refers to one of the four antisocial behavioral categories of the DSM-IV (American Psychiatric Association, 1994). These are Oppositional defiance, Physical aggression, Lying, and Stealing. The sum of the 'Oppositional defiance' and the 'Physical aggression' forms the 'Overt' scale, which refers to direct confrontation with the victim in contrast to the 'Covert' scale, which is the sum of the 'Lying' and 'Stealing' categories. Of the remaining 15 items, 8 are 'Anomalous response' items and 7 are 'Positive filler' items designed to camouflage the 39 main distortion items or questions. The original HIT exhibited high test-retest reliability, good internal consistency and construct validity (Barriaga and Gibbs, 1996; Barriaga et al., 2001).

The Bangla version HIT comprises 27 items under four dimensions which are largely different from the original HIT dimensions (Karim and Begum, 2016). Of the 27 items, 10 items measure 'Catastrophizing and mislabeling', 7 items measure 'Emotional reasoning', 7 items measure 'Self-centeredness and blaming', and 3 items measure 'Overgeneralization'. It does not have any 'Anomalous response' or 'Positive filler' items. However, like the original HIT, the Bangla version HIT also measures four types of antisocial behaviors, and the overt and covert behaviors defined above. The Bangla version HIT and its factors showed acceptable to good internal consistency (Cronbach's  $\alpha = 0.83$  for the HIT, and 0.40–.77 for its factors), and strong construct validity (Karim and Begum, 2016).

## 2.3. Procedures

### 2.3.1. Translating the PBI into Bangla

The PBI items were first translated into Bangla, called the first draft. It was then given to four judges, including one expert in Bangla, one expert in English and two experts in Psychology/Psychometrics. Their native language was Bangla, but being professors/lecturers of a university or college they had also very good command in English. Their task was to judge the accuracy of

translation and relevance/suitability of each item for measuring parental bonding in the socio-cultural context of Bangladesh. Each expert independently rated the translation using a 2-point scale (0 = Not correct, 1 = Correct), and the relevance of each item using another 2-point scale (0 = Not relevant, 1 = Relevant). Following their evaluation, accuracy of the translation was examined by calculating for each item the Accuracy Index (AI = Number of rating at 1/Number of experts; Karim and Begum, 2016; Karim and Nigar, 2014). The item yielding an AI of 1 (AI = 4/4) was considered to be correctly and reliably translated. All the four experts rated 23 items' translation at 1, the AI for each of them becoming 1. The remaining 2 items' yielded an AI of less than 1. The experts suggested some corrections to the clarity, wording and organization of them. By reviewing those items in the light of their comments and suggestions the accuracy of translation was ensured. The relevance/suitability of the items in Bangladeshi culture was examined by calculating for each item the Relevance Index (RI = Number of rating at 1/Number of experts; Karim and Begum, 2016; Karim and Nigar, 2014). The item yielding an RI of 1 or 0.75 (RI = 4/4 or RI = 3/4) was considered relevant or suitable. All the four experts rated the relevance of each item at 1, the RI for each becoming 1. Thus a second draft of the Bangla version PBI was finalized to be administered on the selected participants.

### 2.3.2. Data acquisition

Standard data collection procedures (Karim and Begum, 2016) were followed in the present study. One of the researchers personally met each head/principal of the selected colleges, narrated to him/her the general purpose of the study and got permission to administer the survey on students. On the appointed date and time, the researcher went to a particular college and then to a classroom where she was introduced by the college head/principal with the 11th grade students. Then the general purpose of the study was briefly described to those students, requesting them to cooperate with the researcher. Participants were assured that their responses would be kept confidential and used only for research purposes. After getting their verbal consent the paper-based survey (2nd drafts of the mother and father versions) was administered in person. The survey components included an informed consent statement, socio-demographic section, the translated PBI (both mother and father versions) and the Bangla version HIT (Karim and Begum, 2016). Participants were asked to sign on the consent form, record their socio-demographic information (e.g., gender, age, socio-economic status, parents' educational level), and read carefully the standard instructions of how to respond before going through the items or questions of the scale. The standard instructions included an imperial statement—please do not talk to each other while responding or before finishing the questionnaire. Thus the surveys were administered and data were collected over an 8-week period from all the participants.

### 2.3.3. Data analyses

Each participant's responses were scored according to the scoring principles of the PBI and the HIT. Nine participants left a few HIT items with missing responses and were therefore excluded from further processing. However, for the purpose of factor analysis, only one parental bonding score was obtained for each participant by averaging the scores for the mother and father versions of the PBI. The intention of averaging the scores was to develop a single version of the scale for both parents. Thus data for 191 participants were fed into computer for factor analysis on IBM SPSS Statistics 20. According to standard textbook authors and researchers, the minimum sample size for factor analysis varies from 100 (e.g., Gorsuch, 1983; Kline, 1979) to 250 (e.g., Cattell, 1978), and there is practice of applying factor analysis even to the

data for less than 100 participants (e.g., Widyanto and McMurrin, 2004). There is another set of recommendations varying from a minimum SV (subjects-to-variables) ratio of 2:1 (e.g., Guilford, 1956; Kline, 1979) to 10:1 (e.g., Everitt, 1975; Kuncze et al., 1975; Marascuilo and Levin, 1983; Nunnally, 1978). The number of participants in this study was more than 7 times the number of PBI items/variables (25). Thus the sample size required for factor analysis was satisfied. However, before carrying out factor analysis we examined the response distributions of all the PBI items, and also the items' internal consistency by estimating inter-item correlations and item-total correlations. Then we analyzed the data in EFA (Exploratory factor analysis) because the main purpose of this study was to explore the underlying factor structure of the PBI in Bangladeshi culture without imposing a preconceived structure on the outcome. This is in line with the goal of factor analysis- by performing EFA the relationship among a large set of variables and the number of underlying factors are identified whereas by performing CFA (Confirmatory factor analysis) the researcher tests the hypothesis that a relationship between the observed variables and their underlying latent factors exists (Bryman and Cramer, 2005; Chang and Law, 2008; Child, 1990; Karim and Begum, 2016). In addition to assessing the factorial validity of the Bangla version PBI in this way, we also examined its convergent and discriminant validity by estimating inter-subscale correlation, and by correlating the PBI subscales with the HIT and HIT dimensions (cognitive distortions; antisocial behaviors). Finally, we assessed the reliability of the Bangla version PBI by estimating internal consistency (Cronbach's  $\alpha$ ) of the subscales separately.

### 3. Results

#### 3.1. Factor structure

##### 3.1.1. Item analysis

Because 'Care' and 'Overprotection' dimensions of the original PBI measure two opposing characteristics, it can be hypothesized that the 'Care' items would be negatively correlated with the 'Overprotection' items. Exclusion of any items based on such negative correlations will not be appropriate for item analysis. Therefore, we prepared two correlation matrices: one for 'Care' and one for 'Overprotection'. The correlation matrix for PBI: Care (not shown) did not contain any negative values and out of 66 inter-

item correlation coefficients 63 were significant, the average inter-item coefficient being 0.32. The item-subtotal (i.e., item-care total) correlations were also significant and ranged from 0.46 to 0.72 with a mean of 0.61. The correlation matrix for PBI: Overprotection (not shown) contained 14 negative values and out of 78 inter-item correlation coefficients 46 were significant, the average inter-item coefficient being 0.19. The negative inter-item correlations led us to exclude item no.13 and item no.23 (all the negative correlations were associated with either of these two items). When excluded these two items all other item-subtotal (i.e., item-overprotection total) correlations were found to be significant, which ranged from 0.26 to 0.63, with a mean of 0.49.

##### 3.1.2. Factor analysis

Data for the Care and Overprotection subscales of the PBI were analyzed combinedly in EFA. Before doing the analysis, it was examined whether data were suitable for factor analysis. Measures of sampling adequacy were carried out on the 23-item PBI. Inspection of the PBI R-matrix (not shown) revealed a substantial number (35.90%) of coefficients 0.30 and above. The determinant of the R-matrix was 0.001 ( $>0.00001$ , Field, 2005), indicating that there was no multicollinearity (very highly correlated variables) or singularity (perfectly correlated variables) problem. However, the Kaiser-Meyer-Olkin (KMO) measure indicated a value of 0.85 which exceeded the recommended value of 0.60 (Kaiser, 1970), and Bartlett's test of sphericity indicated a  $\chi^2$  value of 1338.90 ( $p < 0.001$ ). All this together supports factorability of the R-matrix. Data for the 23 PBI items were therefore subjected to EFA. Method of principal component (PC) with varimax rotation was used. The initial analysis with eigenvalue  $>1.00$  (the Kaiser-Guttman criterion) extracted 5 factors, accounting for 54.351% of the total variance. However, Floyd and Widaman (1995) suggested that the scree test (Cattell, 1966) is a more accurate method for retaining factors than the Kaiser-Guttman criterion. Inspection of the scree plot indicates a clear break after the 3rd component (Fig. 1a), leading us to retain 3 components. Therefore, we analyzed the data in another EFA, limiting the number of factors to 3 with all factor loadings  $<0.40$  suppressed. The three factors together accounted for 43.928% of the total variance. An inspection of the factor matrix (Table 1) indicates that the items of the 2nd and 3rd factors together represent the 2nd factor (Overprotection) of the original scale. Therefore we analyzed the data in another EFA limiting the

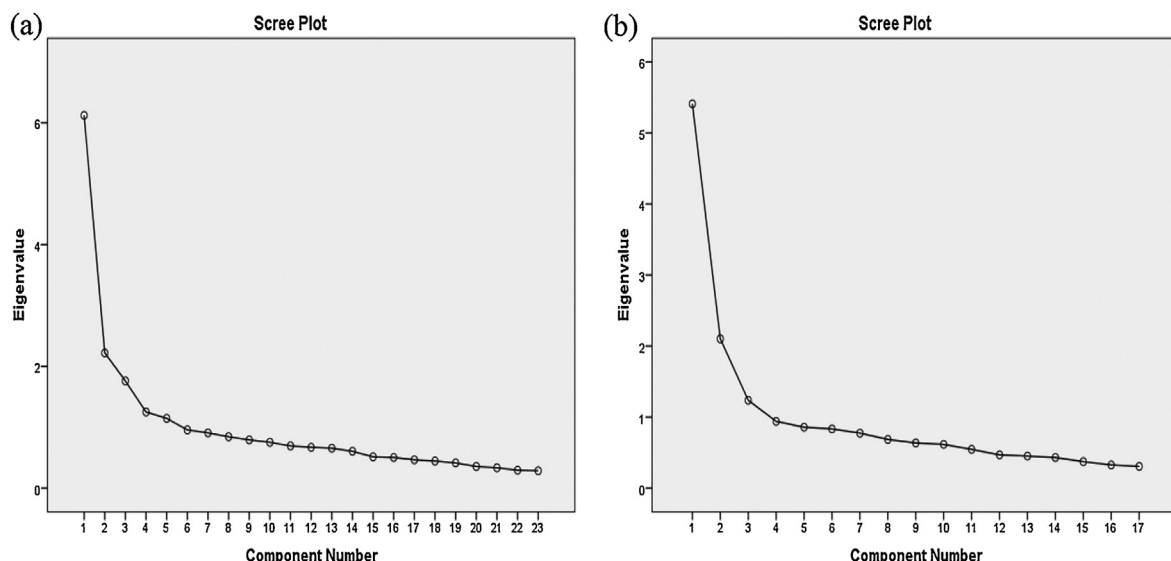


Fig. 1. The scree plots generated in EFA: (a) for 23 items, and (b) for 17 items.

**Table 1**  
Rotated initial three-factor matrix for a set of PBI items.

PBI items	Factor loadings		
	F 1	F 2	F3
Item 01	0.563	−0.465	
Item 02	0.605		
Item 03		0.561	
Item 04	0.484		
Item 05	0.598		
Item 06	0.693		
Item 07		0.446	
Item 08	−0.544		
Item 09			0.584
Item 10			0.581
Item 11	0.547	−0.502	
Item 12	0.598		
Item 14	0.652		
Item 15		0.597	
Item 16	0.602		
Item 17	0.648		
Item 18	0.552		
Item 19			0.610
Item 20			0.529
Item 21		0.616	
Item 22		0.649	
Item 24	0.447		
Item 25		0.540	
Eigenvalue	4.833	2.940	2.331
Variance explained	21.012	12.781	10.135

Note.  $N = 191$ ; Factor loadings  $<0.40$  were suppressed; Extraction method: principal component analysis; Rotation method: varmax with Kaiser normalization; Rotation converged in eleven iterations.

number of factors to 2 with all factor loadings  $<0.40$  suppressed. This recovered the two-factor model of the original scale. The two factors together accounted for 36.270% of the total variance. However, five of the items (item no. 4, 18, 22, 24 and 25) loaded at  $<0.40$ . These low factor loadings indicate that perhaps these items are not suitable to measure parental bonding in Bangladeshi culture. After discarding these items, data were subjected to another EFA with all factor loadings  $<0.40$  suppressed. Again item no. 7 was found to be loaded at  $<0.40$ . After discarding this item data were subjected to a final EFA. This time though the EFA was run without specifying the number of factors a two-factor

**Table 2**  
Rotated two-factor matrix for a reduced set of PBI items.

PBI items	Factor lodgings	
	F1	F2
Item 01	0.763	
Item 02	0.509	
Item 03	−0.570	
Item 05	0.660	
Item 06	0.696	
Item 08		0.476
Item 09		0.619
Item 10		0.660
Item 11	0.755	
Item 12	0.721	
Item 14	0.591	
Item 15	(−0.456)	0.450
Item 16	0.514	(−0.406)
Item 17	0.762	
Item 19		0.643
Item 20		0.512
Item 21	−0.519	
Eigenvalue	5.41	2.47
Variance explained	29.659	14.528
Conbach's (unstandardized) $\alpha$	0.863	0.622

Note.  $N = 191$ ; Factor loadings  $<0.40$  were suppressed; Items corresponding to the parenthesized loadings did not conceptually fit with the corresponding factors; Extraction method: principal component analysis; Rotation method: varmax with Kaiser normalization; Rotation converged in three iterations.

structure of the PBI with 17 items was identified, consistently with the scree plot (Fig. 1b) and the original PBI. These two factors, which were rotated to position of maximum orthogonality in three iterations, together explained 44.187% of the total variance (Table 2). Factor 1 accounts for 29.659% of the total variance, and Factor 2 accounts for 14.528% of the total variance. Before labeling the factors we identified two pairs of cross-loading between the factors. Specifically, item 15 was loaded on both F1 and F2 with the loadings of  $-0.456$  and  $0.450$  respectively, and item 16 was loaded on both F1 and F2 with the loadings of  $0.514$  and  $-0.406$  respectively. We group item 15 under F1, the factor of its smaller but positive loading, and best conceptual fit; and item 16 under F2, the factor of its greater and positive loading, and best conceptual fit. Thus F1 comprises 11 items, including item nos. 1, 2, 3, 5, 6, 11, 12, 14, 16, 17 and 21, and we label this factor as 'Care'. On the other hand, F2 comprises 6 items, including item nos. 8, 9, 10, 15, 19 and 20, and we label this factor as 'Overprotection'. However, an inspection of the figures in Table 2 indicates that two items (item no. 3 and 21) that were under the 'Overprotection' dimension in the original PBI appeared to be negatively loaded under the 'Care' dimension in the present study. Actually, these two items are positive items; to fit them in the 'Overprotection' dimension authors of the original PBI suggested their scoring in reversed order. As they are now subsumed under the 'Care' dimension, the dimension of their conceptual fit, they should no longer be scored in reversed order.

### 3.2. PBI factor scores and parenting styles

Table 3 provides detailed descriptive statistics for the two PBI factors. Regardless of participant's gender, the mean 'Parental care' score was  $26.18 \pm 5.43$ , and the mean 'Parental overprotection' score was  $7.17 \pm 3.20$ . The overall/average 'Parental care' score was the same for both girls and boys whereas the overall/average 'Parental overprotection' score was higher for girls than boys. In addition, there were some differences in how mothers and fathers treated their children. Mothers were, on average, caring of their children more than fathers, consistently across genders. Interestingly, mothers exercised more overprotection on their girls whereas fathers exercised more overprotection on their boys.

In order to further understand the parenting styles in Bangladeshi parents, we proposed for the new Bangla version PBI a cutoff scores system equivalent to that of the English version PBI (Table 4). A score equal to or greater than the cutoff score is considered high and a score which is less than the cutoff score is considered low. Using this cutoff scores system, we categorized their parenting practices into four styles: 'Affectionate constraint' (high care and high protection), 'Affectionless control' (low care and high protection), 'Optimal parenting' (high care and low protection), and 'Neglectful parenting' (low care and low protection). Again, we observed some differences in maternal and paternal parenting style. The figures in Table 5 indicate that, on average, the largest proportion of mothers (38.70%) used Affectionate constraint whereas the largest proportion of fathers (35.10%) used Optimal parenting. However, the proportion of mothers who used Optimal parenting was less than the proportion of the same stylistic fathers by 2% (33.00% vs 35.10%). The proportion of both mothers and fathers who exercised Neglectful parenting was the least, and this has been consistently reported by both girls and boys. However, fathers showed a rate of using this style roughly as twice as the rate in mothers (11.50% vs 5.20%),

### 3.3. Validity

The results of factor analysis demonstrated factorial validity of the Bangla version PBI. We further examined the convergent and

**Table 3**  
Descriptive statistics for the two-factor Bangla version PBI.

	Paternal care	Paternal overprotection	Maternal care	Maternal overprotection	Parental care (average)	Parental overprotection (average)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Boys	24.82 (6.80)	7.26 (4.00)	27.10 (4.84)	6.99 (3.32)	26.29 (5.09)	6.77 (2.78)
Girls	25.23 (6.16)	6.54 (3.13)	26.72 (5.77)	8.01 (4.02)	26.04 (5.82)	7.63 (3.59)
Total	25.01 (6.50)	6.87 (3.58)	26.93 (5.27)	7.46 (3.68)	26.18 (5.43)	7.17 (3.20)

Note. Boys = 103; Girls = 88; Total = 191.

**Table 4**  
Cutoff scores for categorizing parenting styles.

Parental bonding	25-item English PBI	17-item Bangla PBI
Maternal care	27	25
Maternal overprotection	13.5	6
Paternal care	24	22
Paternal overprotection	12.5	6

Note. An equivalent cutoff score for each subscale of the Bangla version PBI was calculated by using the formula: Cut off score for a Bangla subscale =  $\frac{\text{Cut off score of the original subscale}}{\text{Number of items in the original subscale}} \times \text{Number of items in the Bengal subscale}$   
Following the conventional mathematical practice we converted the cutoff scores into the nearest whole number.

discriminant validity of this instrument. The convergent validity was examined by correlating the PBI: Overprotection subscale with cognitive distortions and antisocial behaviors measured by the HIT (Table 6). The discriminant validity was examined by means of two different approaches: (1) estimating inter-factor correlations of the PBI, and (2) correlating the PBI: Care subscale with cognitive distortions and antisocial behaviors measured by the HIT (Table 6). We chose HIT to validate the PBI because cognitive distortion can be related to parenting practices (Karim and Begum, 2016). In a number of studies, parental bonding has been associated with a

**Table 5**  
Proportion of mothers and fathers using different parenting styles.

Parenting styles	Reported by girls		Reported by boys		Average/Overall	
	Mothers	Fathers	Mothers	Fathers	Mothers	Fathers
Affectionate constraint	42.05%	35.92%	34.09%	27.18%	38.70%	30.40%
Affectionless control	25.00%	21.36%	27.27%	19.41%	23.00%	23.00%
Optimal parenting	29.55%	35.92%	31.81%	37.86%	33.00%	35.10%
Neglectful parenting	3.00%	6.79%	6.82%	15.53%	5.20%	11.50%

Note. Boys = 103; Girls = 88; Total = 191.

**Table 6**  
Correlations of the Bangla version PBI with the Bangla version HIT questionnaire.

The HIT questionnaire		PBI subscales	
		Care	Overprotection
HIT factors/cognitive distortions	Catastrophizing and mislabeling	−0.24**	.22**
	Emotional reasoning	−0.43**	.18**
	Self-Centeredness and blaming	−0.19**	.23**
	Overgeneralization	−0.23**	.38**
Antisocial behaviors	Lying	−0.33**	.29**
	Stealing	−0.11	.16
	Physical aggression	−0.41**	.18
	Oppositional defense	−0.41**	.38**
	HIT	−0.38**	.31**

Note. N = 191.

\*  $p < 0.05$  (2-tailed).

\*\*  $p < 0.01$  (2-tailed). Source: Karim and Begum (2016).

person's psychopathology (Canetti et al., 1997; Enns et al., 2002; Gao et al., 2010), such as obsessive compulsive disorder, depression (Myhr et al., 2004), and anxiety (Carter et al., 2001). Ineffective parenting practices have been positively associated with childhood conduct disorder (Patterson et al., 1989) and other mental health problems (Canetti et al., 1997; Martin and Waite, 1994; Rey, 1995). Thus we hypothesized that the HIT and all its dimensions (cognitive distortions; antisocial behaviors) would be positively correlated with the PBI 'Overprotection' subscale, and negatively correlated with the PBI 'Care' subscale.

### 3.3.1. Convergent validity

As hypothesized, Table 6 shows that the PBI: Overprotection subscale was significantly and positively correlated with the Bangla version HIT ( $r=0.31$ ), the four cognitive distortions ( $r=0.18-0.38$ ) and the four antisocial behaviors ( $r=0.16-0.38$ ) measured by the HIT.

### 3.3.2. Discriminant validity

As expected, the PBI: Care subscale was significantly and negatively correlated with the PBI: Overprotection subscale ( $r=-0.35$ ,  $p < 0.01$ ). As a further evidence of the discriminant validity and in support of the above hypothesis, the PBI: Care subscale was negatively correlated (significant or non-significant)

with the Bangla version HIT ( $r = -0.38$ ), the four cognitive distortions ( $r = -0.19$  to  $-0.43$ ) and the four antisocial behaviors ( $r = -0.11$  to  $-0.41$ ) measured by the HIT (Table 6). All these correlations strongly support the discriminant validity of the two PBI subscales.

### 3.4. Reliability

The reliability of the Bangla version PBI was examined by estimating internal consistency. The coefficients of Cronbach's  $\alpha$  were calculated. Cronbach's  $\alpha$  (unstandardized) for the PBI: Care subscale was 0.863, and for the PBI: Overprotection subscale was 0.622. Thus the Bangla version PBI was found to be reliable.

## 4. Discussion

This study was designed to validate the PBI in Bangladeshi culture in order to enable scientists and clinicians to work on parenting practices, child care and neglect. Analyzing the data in EFA we identified a two-factor model for the PBI, comprising 17 items (Table 2); the other 8 items were dropped at different stages of the analysis. Prior to inclusion or exclusion of any items they were carefully analyzed in terms of contents, inter-item correlations, and factor loadings (Karim and Begum, 2016). Thus Factor 1 appeared to comprise 11 items which measure parental care, and Factor 2 appeared to comprise 6 items which measure parental overprotection. The two factors together accounted for 44.187% of the total variance, the individual contributions of 'Care' and 'Overprotection' being 29.659% and 14.528% respectively. The factors showed moderate to high internal consistency (Cronbach's  $\alpha = 0.863$  for Care; 0.622 for Overprotection), Factor 1 being most reliable as indicated by its highest coefficient. The two factors demonstrated low and negative inter-correlation (though it was significant) which

strongly supports the representation of the factors as unique, bipolar components of the scale.

As mentioned earlier in this paper, previous analyses have shown between two- and four- factor solutions for the PBI. Despite this disagreement, the factor arrangement from prior analyses in Table 7 shows striking resemblances to our results. The figures in this table illustrate that the greatest amount of agreement appears between our two-factor model and Parker's original two-factor model (Parker et al., 1979). That is, Factor 1 (Care) of the present two-factor model most closely resembles, in terms of content items (item no. 1, 2, 5, 6, 11, 12, 14, 16 and 17), the first factor of Parker's model. This factor also very closely resembles the first factor of Cubis's three-factor model (Cubis et al., 1989). Consistently, Factor 2 (Overprotection) of the present model represents (though shortly in number of content items) the second factor of Parker's model, and is roughly represented by some combination of the second (Protection personal) and third (Protection social) factors of Cubis's model. From a close inspection of this table, Factor 1 (Care) appears to be very stable across cultures. However, in a few cultures, it still showed a lack of stability (see Kapçı and Küçükler, 2006; Suzuki and Kitamura, 2011; Uji et al., 2006) perhaps due to differences in sample characteristics (e.g., culture-based subjective/personal experiences with parents), or due to some other unknown reasons. Factor 2 (Overprotection) appears to be relatively unstable across cultures, and this is consistent with our observation that most of the items excluded in the present study were from the second factor of Parker's original model. They were excluded because of their invalidity or unsuitability to measure parental bonding in Bangladeshi culture. There are three possible candidates to explain this invalidity/unsuitability of the items. First, the parents in Bangladesh might not necessarily exercise parenting practices in exactly the same manner as do the parents of an English culture. Second, due to the impact of social desirability variable participants might not reflect their actual response tendencies to those items as they were about parental

**Table 7**  
A comparison of the current PBI factor model with its previous factor models.

Current PBI model		Previous PBI models									
Factors	Items	1979 <sup>a</sup>	1989 <sup>b</sup>	1993 <sup>c</sup>	1997 <sup>d</sup>	1997 <sup>e</sup>	2005 <sup>f</sup>	2006 <sup>g</sup>	2006 <sup>h</sup>	2011 <sup>i</sup>	2014 <sup>j</sup>
F1: Care	Item 01	1	1	1	1	1	1	–	1	1	1
	Item 02	1	1	1	1	–	1	–	2	2	1
	Item 03	2	3	3	–	–	3	1	4	4	3
	Item 05	1	1	1	1	1	1	–	1	1	1
	Item 06	1	1	1	1	–	1	–	1	1	1
	Item 11	1	1	1	1	1	1	–	1	1	1
	Item 12	1	1	1	1	1	1	–	1	1	1
	Item 14	1	1	1	1	–	1	–	2	2	1
	Item 16	1	1	–	1	–	–	–	2	2	–
	Item 17	1	1	1	1	1	–	–	1	1	1
	Item 21	2	3	3	3	–	3	1	4	4	2
F2: Overprotection	Item 08	2	2	2	2	2	2	–	3	3	–
	Item 09	2	3	2	2	2	3	2	3	3	3
	Item 10	2	2	–	–	–	3	2	3	3	3
	Item 15	2	3	3	3	–	3	1	4	4	2
	Item 19	2	2	2	2	2	2	2	3	3	–
	Item 20	2	3	3	2	–	2	2	3	3	3

Note. Numbers indicate the factors each item belongs to (e.g., 1 indicates that the item belongs to factor 1, 2 indicates that the item belongs to factor 2, and so on). (–) item dropped.

<sup>a</sup> Parker et al. (1979).

<sup>b</sup> Cubis et al. (1989).

<sup>c</sup> Gómez-Beneyto et al. (1993).

<sup>d</sup> Murphy et al. (1997).

<sup>e</sup> Kendler et al. (1997).

<sup>f</sup> Qadir et al. (2005).

<sup>g</sup> Kapçı and Küçükler (2006).

<sup>h</sup> Uji et al. (2006).

<sup>i</sup> Suzuki et al. (2011).

<sup>j</sup> Mahammad et al. (2014).

overprotection behaviors. This might be especially true in Bangladesh where social expectation from the adolescents is very high, and failure of fulfilling such an expectation might be punishable. A third and related variable might be adolescents' personality – they might be too reserved and scared to honestly provide data of the actual negative experiences they had with their parents.

However, the present study has some important features that made the new Bangla version PBI distinct from all of its previous versions. One of the features is that item nos. 3 and 21 that have been included in the 'Overprotection' subscale of the original PBI represent the 'Care' subscale of the Bangla version PBI (Table 7). The two items are "Let me do the things I like doing" and "Give me as much freedom as I want". It appears that they are actually positive items, and have best conceptual fit with 'Care' rather than 'Overprotection' dimension. To fit these items in 'Overprotection' dimension authors of the original PBI suggested scoring for them in reversed order (Parker et al., 1979). Such a scoring system probably caused them loaded negatively with the 'Care' dimension in the present study (Table 2). As these items are now subsumed under the 'Care' dimension, they should no longer be scored in reversed order. A second aspect of this study is that unlike many other studies we analyzed the PBI factor scores in terms of maternal and paternal bonding with boys and girls separately. We found that, there are some differences between the maternal and paternal cares, and between the maternal and paternal overprotection exercised on children (Table 3). On average, mothers were caring of their children more than fathers. In addition, mothers were more overprotective of their girls than boys whereas fathers were more overprotective of their boys than girls. Related to the second aspect, a third important aspect is that unlike most of the previous studies on the PBI we developed a four-category parenting styles (Affectionate constraint, Affectionless control, Optimal parenting, and Neglectful parenting), using an equivalent cutoff scores system of Parker's original model. As reported by both girls and boys, the greatest number of mothers preferred to employ Affectionate constraint whereas the greatest number of fathers preferred Optimal parenting (Table 5). However, the number of mothers who preferred Optimal parenting was less than the number of the same stylistic fathers only by 2% (33.00% vs 35.10%; Table 5). The number of both mothers and fathers who exercised Neglectful parenting was the least; however, fathers showed a rate of using this style roughly as twice as the rate in mothers (11.50% vs 5.20%; Table 5). A fourth aspect is that we developed a single version PBI for both parents to assess their individual as well as overall parental bonding, parental care and neglect. A single version instrument can be more parsimonious than two different versions in terms of its use and score interpretation. Thus it can contribute more to the understanding of the holistic contribution of the two parents in child development. Apparently it may seem to be disadvantageous for children with a single parent (mother only or father only). However, it is actually not disadvantageous for them because in line with the original PBI this new version has a cutoff scores system for both the parents, and this has made the instrument usable for children with two parents as well as for those with a single parent. A fifth aspect of this study is that it focused on the current state of the relationship between parents and their adolescent children in contrast to many other studies which retrospectively assessed how they were raised by their parents during the first 16 years of their life (Gómez-Beneyto et al., 1993; Cubis et al., 1989; Kendler et al., 1997; Murphy et al., 1997; Parker et al., 1979; Qadir et al., 2005; Uji et al., 2006). Finally, the Bangla version PBI is distinct in terms of its convergent and discriminant validity that were examined by estimating inter-subscale correlation, and by correlating the two subscales with cognitive distortions and antisocial behaviors measured by the HIT. This

demonstrated the discriminant validity of both the subscales, but convergent validity of the 'Overprotection' subscale only. Due to the lack of an appropriate measure or a variable we were not able to directly examine the convergent validity of the 'Care' subscale. However, this is not a weakness of the subscale or the PBI because it has both factorial validity and discriminant validity.

Like many other studies, this study has a number of limitations, suggesting avenues for new studies. One of the limitations is the reliance on a sample of small size ( $N = 191$ ). Data from such a small sample might have led to the insufficient reliability of the 'Overprotection' subscale (Cronbach's  $\alpha = 0.622$ ). Though the minimum sample size required for factor analysis was satisfied in this study future replication studies on a larger sample can improve the reliability and validity coefficients (Karim and Begum, 2016; Karim and Nigar, 2014). A second limitation is that we validated the PBI on a sample of higher secondary students/adolescents only. To do so, data were collected from those who live in the capital city (Dhaka) only. Though Bangladesh is an extremely culturally homogeneous country generalizing results from such a sample of convenience to other adolescents may not be warranted (Karim and Begum, 2016; Karim and Nigar, 2014). A third limitation is that we did not examine the temporal stability of the PBI, and the influences of participants' mood state or personality and social desirability variable on their responses. Therefore, we finally suggest that future studies should consider a large scale sample of adolescents from different regions of the country in order to test in CFA the current factor structure of the Bangla version PBI. Future studies can also examine temporal stability and the influences of participants' mood state or personality and social desirability variable on the outcomes (Karim and Begum, 2016; Karim and Nigar, 2014).

In conclusion, this study equips us with a psychometric tool, the Bangla version PBI, to be useful for diagnostic and research purposes to the understanding of parenting practices, child care and neglect, and their consequences on children's mental health and development. Thus despite the above limitations, the present study opens the door of future research on parenting or child rearing practices and clinical implications of the PBI in Bangladesh.

## References

- Almeida, N.D., Loucks, E.B., Kubzansky, L., Pruessner, J., Maselko, J., Meaney, M.J., Buka, S.L., 2010. Quality of parental emotional care and calculated risk for coronary heart disease. *Psychosom. Med.* 72 (2), 148–155.
- American Psychiatric Association, 1944. *Diagnostic and Statistical Manual of Mental Disorder*, 4th ed. American Psychiatric Association, Washington, DC.
- Arrindell, W.A., Kwee, M.G.T., Methorst, G.J., van der Ende, J., Pol, E., Moritz, B.J.M., 1989. Perceived parental rearing styles of agoraphobic and socially phobic in-patients. *Br. J. Psychiatry* 155 (4), 526–535.
- Avagianou, P.A., Zafropoulou, M., 2008. Parental bonding and depression: personality as a mediating factor. *Int. J. Adolesc. Med. Health* 20 (3), 261–269.
- Barriga, A.Q., Gibbs, J.C., 1996. Measuring cognitive distortion in antisocial youth: development and preliminary validation of the How I Think questionnaire. *Aggress. Behav.* 22 (5), 333–343.
- Barriga, A.Q., Gibbs, J.C., Potte, G.B., Liau, A.K., 2001. *How I Think (HIT) Questionnaire Manual*. Research Press, Champaign, IL.
- Bryman, A., Cramer, D., 2005. *Quantitative Data Analysis with SPSS 12 and 13: A Guide for Social Scientists*. Routledge, New York, NY.
- Canetti, L., Bachar, E., Galili-Weisstub, E., De-Nour, A.K., Shalev, A.Y., 1997. Parental bonding and mental health in adolescence. *Adolescence* 32 (126), 381–394.
- Canetti, L., Kanyas, K., Lerer, B., Laezer, Y., Bachar, E., 2008. Anorexia nervosa and parental bonding: the contribution of parent grandparent relationships to eating disorder psychopathology. *J. Clin. Psychol.* 64 (6), 703–716.
- Carter, M.M., Sbrocco, T., Lewis, E.L., Friedman, E.K., 2001. Parental bonding and anxiety: differences between african american and european american students. *J. Anxiety Disord.* 15 (6), 555–569.
- Cattell, R.B., 1966. The scree test for the number of factors. *Multivariate Behav. Res.* 1 (2), 245–251.
- Cattell, R.B., 1978. *The Scientific Use of Factor Analysis*. Plenum, New York, NY.
- Chang, M.K., Law, S.P.M., 2008. Factor structure for Young's Internet Addiction Test: a confirmatory study. *Comput. Hum. Behav.* 24 (6), 2597–25619.
- Child, D., 1990. *The Essentials of Factor Analysis*, 2nd ed. Cassel Educational Limited, London.



- Craissati, J., McClurg, G., Browne, K., 2002. The parental bonding experiences of sex offenders: a comparison between child molesters and rapists. *Child Abuse Negl.* 26 (9), 909–921.
- Cubis, J., Lewin, T., Dawes, F., 1989. Australian adolescents' perceptions of their parents. *Aust. N. Z. J. Psychiatry* 23 (1), 35–47.
- Daire, A.P., 2002. The influence of parental bonding on emotional distress in care giving sons for a parent with dementia. *Gerontologist* 42 (6), 766–771.
- Enns, M.W., Cox, B.J., Clara, I., 2002. Parental bonding and adult psychopathology: results from the US national comorbidity survey. *Psychol. Med.* 32 (6), 997–1008.
- Everitt, B.S., 1975. Multivariate analysis: the need for data, and other problems. *Br. J. Psychiatry* 126 (3), 237–240.
- Field, A.P., 2005. *Discovering Statistics Using SPSS*, 2nd ed. Sage, London.
- Floyd, F.J., Widaman, K.F., 1995. Factor analysis in the development and refinement of clinical assessment instruments. *Psychol. Assess.* 7 (3), 286–299.
- Gao, Y., Raine, A., Chan, F., Venables, P.H., Mednick, S.A., 2010. Early maternal and paternal bonding, childhood physical abuse and adult psychopathic personality. *Psychol. Med.* 40 (6), 1007–1016.
- Garbarino, J., Collins, C.C., 1999. Child neglect: the family with a hole in the middle. In: Dubowitz, H. (Ed.), *Neglected Children: Research, Practice and Policy*. Sage, Thousand Oaks, CA, pp. 1–23.
- Gómez-Beneyto, M., Tomas, A.P., Aguilar, K., Leal, C., 1993. Psychometric properties of the parental bonding instrument in a Spanish sample. *Soc. Psychiatry Psychiatr. Epidemiol.* 28 (6), 252–255.
- Gorsuch, R.L., 1983. *Factor Analysis*, 2nd ed. Erlbaum, Hillsdale.
- Guilford, J.P., 1956. *Psychometric Methods*. McGraw-Hill, New York, NY.
- Handa, H., Ito, A., Tsuda, H., Ohsawa, I., Ogawa, T., 2009. Low level of parental bonding might be a risk factor among women with prolonged depression: a preliminary investigation. *Psychiatry Clin. Neurosci.* 63 (6), 721–729.
- Hauck, S., Schestatsky, S., Terra, L., Knijnik, L., Sanchez, P., Ceitlin, L.H.F., 2006. Adaptação transcultural para o português brasileiro do Parental Bonding Instrument (PBI). *Revista de Psiquiatria do Rio Grande do Sul.* 28 (2), 12–23.
- Kaiser, H.F., 1970. A second generation little jiffy. *Psychometrika* 35 (4), 401–415.
- Kapçı, E., Küçükler, S., 2006. The Parental Bonding Instrument: evaluation of its psychometric properties with Turkish university students. *Turk. J. Psychiatry* 17 (4), 1–10.
- Karim, A.K.M.R., Begum, T., 2016. How I Think questionnaire: assessing its psychometric properties in Bangladeshi culture. *Asian J. Psychiatry* 21, 9–16.
- Karim, A.K.M.R., Nigar, N., 2014. The Internet Addiction Test: assessing its psychometric properties in Bangladeshi culture. *Asian J. Psychiatry* 10, 75–83.
- Kendler, S., Sham, P.C., MacLean, C.J., 1997. The determinants of parenting: an epidemiological, multi-informant, retrospective study. *Psychol. Med.* 27 (3), 549–563.
- Klimidis, S., Minas, I.H., Ata, A.W., Stuart, G.H., 1992. Construct validation in adolescents of the brief current form of the Parental Bonding Instrument. *Compr. Psychiatry* 33 (6), 378–383.
- Kline, P., 1979. *Psychometrics and Psychology*. Academic Press, London.
- Kunze, J.T., Cook, D.W., Miller, D.E., 1975. Random variables and correlational overkill. *Educ. Psychol. Meas.* 35 (3), 529–534.
- Liu, J., Li, L., Fang, F., 2011. Psychometric properties of the Chinese version of the Parental Bonding Instrument. *Int. J. Nurs. Stud.* 48 (5), 582–589.
- Mahammad, N.A., Shamsuddin, K., Omar, K., Shah, S.A., Amin, R.M., 2014. Validation of the Malay version of the Parental Bonding Instrument among Malaysian youths using exploratory factor analysis. *Malaysian J. Med. Sci.* 21 (5), 51–59.
- Marascuilo, L.A., Levin, J.R., 1983. *Multivariate Statistics in the Social Sciences*. Brooks/Cole, Monterey.
- Martin, G., Waite, S., 1994. Parental bonding and vulnerability to adolescent suicide. *Acta Psychiatr. Scand.* 89 (4), 246–254.
- Murphy, E., Brewin, C.R., Silka, L., 1997. The assessment of parenting using the Parental Bonding Instrument: two or three factors? *Psychol. Med.* 27 (2), 333–341.
- Myhr, O.R., Grong, Ø., Fjær, H.J., Marioara, C.D., 2004. Modeling of the microstructure and strength evolution in Al-Mg-Si alloys during multistage thermal processing. *Acta Mater.* 52 (17), 4997–5008.
- Narita, T., Sato, T., Hirano, S., Gota, M., Sakado, K., Uehara, T., 2000. Parental child-rearing behaviour as measured by the Parental Bonding Instrument in a Japanese population: factor structure and relationship to a lifetime history of depression. *J. Affect Disord.* 57, 229–234.
- Nunnally, J.C., 1978. *Psychometric Theory*, 2nd ed. McGraw-Hill, New York, NY.
- Panfilis, D.C., Salvatore, P., Marchesi, C., Cazzolla, R., Tonna, M., Maggini, C., 2008. Parental bonding and personality disorder: the mediating role of alexithymia. *J. Personality Disord.* 22 (5), 496–508.
- Parker, G., Tupling, H., Brown, L.B., 1979. A Parental Bonding Instrument. *Br. J. Med. Psychol.* 52 (1), 1–10.
- Parker, G., 1983. *Parental Overprotection: A Risk Factor in Psychosocial Development*. Grune & Stratton, New York, NY.
- Patterson, G.R., DeBaryshe, B.D., Ramsye, E., 1989. A developmental perspective on antisocial behavior. *Am. Psychol.* 44 (2), 329–335.
- Plantés, M.M., Prusoff, B.A., Brennan, J., Parker, G., 1988. Parental representations of depressed outpatients from a U.S.A. sample. *J. Affect Disord.* 15 (2), 149–155.
- Qadir, F., Stewart, R., Khan, M., Prince, M., 2005. The validity of the Parental Bonding Instrument as a measure of maternal bonding among young Pakistani women. *Soc. Psychiatry Psychiatr. Epidemiol.* 40 (4), 276–282.
- Rey, A., 1995. *Essays on Terminology*. John Benjamins Publishing.
- Smith, G.T., McCarthy, D.M., 1995. Methodological considerations in the refinement of clinical assessment instruments. *Psychol. Assess.* 7 (3), 300–308.
- Suzuki, H., Kitamura, T., 2011. The Parental Bonding Instrument: a four-factor structure model in a Japanese college sample. *Open Fam. Stud. J.* 4 (1), 89–94.
- Tsaousis, I., Mascha, K., Giovazolias, T., 2012. Can parental bonding be assessed in children? Factor structure and factorial invariance of the Parental Bonding Instrument (PBI) between adults and children. *Child Psychiatry Hum. Dev.* 43 (2), 238–253.
- Turner, H.M., Rose, K.S., Cooper, M.J., 2005. Parental bonding and eating disorder symptoms in adolescents: the mediating role of core beliefs. *Eating Behav.* 6 (2), 113–118.
- Uji, M., Tanaka, N., Shono, M., Kitamura, T., 2006. Factorial structure of the Parental Bonding Instrument (PBI) in Japan: a study of cultural, developmental, and gender influences. *Child Psychiatry Hum. Dev.* 37 (2), 115–132.
- Widyanto, L., McMurrin, M., 2004. The psychometric properties of the Internet Addiction Test. *Cyberpsychol. Behav.* 7 (4), 443–450.
- Willinger, U., Diendorfer-Radner, G., Willnauer, R., Jorgl, G., Hager, V., 2005. Parental stress and parental bonding. *Behav. Med.* 31 (2), 63–69.
- Yoshida, T., Taga, C., Matsumoto, Y., Fukui, K., 2005. Paternal overprotection in obsessive-compulsive disorder and depression with obsessive traits. *Psychiatry Clin. Neurosci.* 59 (5), 533–538.