

CONFIRMATORY FACTOR ANALYSIS OF THE MBI IN COLOMBIAN PARENTS OF CHILDREN WITH TRISOMY 21

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The identification of parental burnout syndrome in families with chronically ill children has become a problem of interest given that the burnout syndrome can lead to loss of interest for the well-being of the child. There is no recommended tool to determine parental burnout. The aim of this study is to validate the Maslach Burnout Inventory Health Services Survey (MBI-HSS; Maslach, Jackson, & Leiter, 1996) in a population of parents of children with Down syndrome. We performed a confirmatory factor analysis and validation of the MBI-HSS in 103 Colombian parental couples of children with trisomy 21. In the confirmatory factor analysis, we found a coefficient of .82 in the intercorrelation of all the items, indicating that the three factors did not explain the construct. We found differences between the expected and observed covariance matrices with goodness-of-fit test $LR^1 = 423.758$ ($p < .001$). The Kaiser-Meyer-Olkin (KMO) index was .80. In the subsequent exploratory factor analysis (EFA), we found that two factors explained 83% of the variance. Our findings suggest that the items of the original construct are not able to diagnose the tridimensional burnout syndrome in parents and that a construct of two dimensions could be enough to diagnose parental burnout.

Key words: Parental burnout; Parent child relations; Maslach Burnout Inventory; Trisomy 21, Burnout syndrome.

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The concept of burnout was initially described by Bradley (1969) in a paper about the reactions of personnel in charge of juvenile offenders' rehabilitation. Between 1974 and 1976 two different authors, Freudenberg (1974) and Maslach (1976), described the syndrome as a psychological response to continuing stress. Nevertheless, the widely used definition was developed by Maslach and Jackson (1986) as a syndrome that encompasses emotional exhaustion, depersonalization, and lack of personal accomplishment in people developing an occupation. Subsequently, the diagnosis of burnout transcended the workplace and is used to classify a certain response to continued stress of caregivers and parents.

The experience of parenting a child diagnosed with a disability, especially a child with trisomy 21, is very challenging because of the mental impairment and comorbidities that usually accompany the syndrome (Cuskelly & Gunn, 2006; Erickson & Upshur, 1989; Nunes, Dupas, & Nascimento, 2011; Tracy, 2011). Parental stress has been described as the experience of distress or discomfort that results from demands related to the role of parenting (Deater-Deckard, 1998),

and the chronic experience of stress leads to a physical and psychological state of complete exhaustion called burnout. Parental burnout was first described by Procaccini and Kiefaber (1983) as a condition resulting from untreated chronic exhaustion due to the persisting demands of family needs and dropping out of nonparental activities, which depletes the energy and motivation of the parents. This makes parents feel guilty and angry, reduces their ability to manage caregiving demands, and leads to loss of interest in the child. Nowadays, the actual prevalence of parental burnout is unknown. To our knowledge, there are no validated or specific tools to identify this syndrome in parenting populations which leads to a major problem, because there is no awareness of its frequency and the damage that it could cause to the family's well-being. According to some authors, the prevalence of the burnout syndrome in parents with children with chronic diseases is estimated at about 40% (Lindström, Aman, & Norberg, 2010, 2011).

In 1986, Maslach and Jackson designed an inventory to identify occupational burnout. In 1996 the Maslach Burnout Inventory was revised by Maslach, Jackson, and Leiter and a new survey was produced, the Human Services Survey (MBI-HSS). This measurement scale has become the preferred tool to identify the burnout syndrome in many populations (Chao, McCallion, & Nickle, 2011; Correa-Correa, Muñoz-Zambrano, & Chaparro, 2010; Dyrbye & Shanafelt, 2011; Dyrbye, West, Satele, Sloan, & Shanafelt, 2011; Gil-Monte & Olivares Faúndez, 2011; Gray-Stanley & Muramatsu, 2011; Maslach, Schaufeli, & Leiter, 2001; Ramírez, Ortega, Villamizar, & Leiton, 2009; Seisdedos, 1997). It has been used in several countries and in different languages to determine the presence of burnout syndrome in caregivers (Abe & Ohashi, 2011; Akintola, Hlengwa, & Dageid, 2013; Angermeyer, Bull, Bernert, Dietrich, & Kopf, 2006; Ayalon, 2008; Benevides-Pereira & Das Neves Alves, 2007; Embriaco, Papazian, Kentish-Barnes, Pochard, & Azoulay, 2007). In 1997 the MBI-HSS was translated and validated in Spanish by Seisdedos. The Spanish translation was also validated in caregivers working in nursing homes, at schools, and in adoption institutions (Correa-Correa et al., 2010; González-Losa, Vázquez-García, & Esperón, 2013; Masuko, Yamagishi, Kishi, & Miyake, 1989; Menezes de Lucena Carvalho, Fernández Calvo, Hernández Martín, Ramos Campos, & Contador Castillo, 2006). In the Colombian population, the MBI-HSS was also validated in workers and in caregivers. (Córdoba et al., 2011; De Valle-Alonso, Hernández-López, Zúñiga-Vargas, & Martínez-Aguilera, 2015).

The 1986 version of MBI was also validated in English by Pelsma, Roland, Tollefson, and Wigington (1989) in a population of mothers with young children. In their article, the authors performed an exploratory factor analysis and results suggested that there may not be a distinct burnout domain corresponding to depersonalization (DP) in the parent-child relationship. They concluded that burnout syndrome in parents may differ from occupational burnout in DP responses, but the feeling of emotional exhaustion (EE) and the lack of personal accomplishment (PA) are similar and therefore can be determined with the MBI. To our knowledge, no other studies concerning this subject have been published. Furthermore, an exploratory factor analysis is not the method of choice to confirm whether a developed instrument has the same structure across different population subgroups (Albright, 2006-2008; Jackson, Gillaspay, & Purc-Stephenson, 2009).

The objective of this study was to determine whether the MBI-HSS provides a valid determination of parental burnout, to determine the number of factors of the instrument, and to confirm whether the items designated to the factors fit the original ones. Therefore, we performed a confirmatory factor analysis of the MBI-HSS Spanish version applied to a sample of parents with children with trisomy 21.

METHOD

We conducted a scale validation of the MBI-HSS nested into a prevalence study as a secondary analysis. In our validation study, we performed a cognitive debriefing, a reliability analysis, a content validity analysis, and a construct validity with a confirmatory factor analysis (CFA). As the CFA results were inconclusive, an additional exploratory factor analysis (EFA) was performed in order to clarify internal structure of the construct according to our data.

Participants

The population selection criteria and recruitment method have been described elsewhere (Jaramillo, Moreno, & Rodríguez, 2016). The questionnaires were obtained from 206 parents (103 parental couples) following informed, written consent in accordance with the Declaration of Helsinki and with approval of the local ethical committee. This sample size gives us a ratio of nine participants per each item of MBI-HSS, which is sufficient to conduct a CFA (Bryant, & Yarnold, 1995; MacCallum, Widaman, Zhang, & Hong, 1999). We employed incidental sampling until we reached the sample size.

Measures

We used the MBI-HSS, previously translated into Spanish and validated in 1997 by Seisdedos. The instrument has 22 items to be answered on a range from 0 (*never*) to 6 (*every day*) and corresponds to the frequency of occurrence of one event. We changed the evaluated subject “my work” from the original scale (Maslach, Jackson, & Leiter, 1997) to “my child with trisomy 21.”

The content validity was determined using the Delphi method. We put together a group of three experts, which represented the most relevant clinicians involved in the treatment of the children and their families: a neuropsychologist, a child psychiatrist, and a clinical geneticist. The experts were chosen by convenience. Each of the experts received the motivation and objectives of the research, and the items of the modified MBI-HSS. They were asked to rate each item of the inventory. These had to be answered on a range from 1 (*completely disagree*) to 4 (*completely agree*). If they disagreed with an item, they had to write down the reason for the disagreement. Another task was to evaluate whether each item of the inventory contributed to the construct, and whether the answers were consistent. After a week, we discussed each of the items with the panel members. The same methodology was used in a second round one week later.

The cognitive debriefing of the inventory was determined in a pilot study with five couples according to the recommendations of Willis (2004). This part of the study took place during a gathering of families with children with trisomy 21, organized by five nongovernmental organizations (NGOs). The questionnaires were given to the participants, and after 40 minutes we discussed each of the items, the questions, and the recommendations from the parents.

The final version of the questionnaire was given to the NGOs and the principals of the special schools that participated in the study. They were trained to answer any question that might arise. The questionnaires had to be answered by both parents in a meeting scheduled by the principal or coordinator of the institution.

The reliability analysis was conducted using Cronbach's alpha coefficient, taking into account the factor structure of the original MBI-HSS. Afterward, each factor was analyzed individually. In order to evaluate the construct validity, we performed a CFA, in which we calculated four different fit indexes: root mean square error of approximation (RMSEA), root mean square residual (RMSR), Tucker-Lewis index (TLI), and comparative fit index (CFI). The factorability of our construct was evaluated with a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Finally, to find the number of factors within the construct, we conducted an EFA in which the cut-off for eigenvalues was .70. These were calculated using STATA 12 software.

RESULTS

The enumeration and organization of items in this section of the article is identical to the one found in the original version of the MBI-HSS (Maslach et al., 1997; Seisdedos, 1997). Although the demographics of our participants were described in a previous article (Jaramillo et al., 2016), Table 1 summarizes the relevant characteristics of the subjects in our sample. We received all the questionnaires that were handed out fully answered. About one fourth of the sample (50 parents) took the questionnaire home and sent it to the school two or three days later. All of them declared to have answered the questionnaire by themselves.

TABLE 1
Distribution of demographic characteristics among parents

Variable	Mothers	Fathers
	<i>N</i> = 103	<i>N</i> = 103
	%	%
Age in years (mean \pm SD)	46.07 \pm 0.74	43.07 \pm 0.73
<i>Occupational Status</i>		
Full-time employee	30.10	89.32
Part-time employee	16.50	5.83
Unemployed/homestay	53.40	4.85
<i>Marital status</i>		
Single	6.80	3.88
Cohabiting	37.86	40.78
Married	48.54	51.46
Separated	6.80	3.88

In the content validity analysis, the experts agreed that each of the items was essential to correctly evaluate the presence of burnout syndrome in our scope population. There were no differences between the first and second round; therefore, a third one was not necessary. No changes

were made in the inventory besides the replacement of the expression “my work” to my “child with Down syndrome.”

In the cognitive debriefing, we verified that the participants understood the items in our questionnaire and could answer them without difficulties. The participants in the pilot study were not included in the final analysis. Following the recommendations of the parents concerning Item 22, we added the phrasing “in some cases,” in order to include all the possible situations in which a parent could feel guilty about the problems of his/her child regardless of the child’s mental impairment. Translated from Spanish the item is “In some cases, I feel that my child with Down syndrome blames me for his problems.”

The next step of the validation was the reliability analysis with Cronbach’s alpha. In the intercorrelation of all the items, we obtained a coefficient of .82. This suggested a good internal consistency and may imply that the items measured the same construct (Moret, Mesbah, Chwalow, & Lellouch, 1993). In the second analysis, we calculated the coefficient for each factor. In the EE it was .85, in the PA it was .67, and in the DP it was .47.

The CFA was conducted using the original MBI-HSS as a latent construct. We found that the three factors did not explain the construct. In the goodness-of-fit test, $LR = 423.758$, $p < .001$, p -values smaller than .05 indicate that there are considerable differences between the expected and observed covariance matrices. This means that our data did not adjust to the theoretical construct. The analysis of fit indexes showed similar results: RMSEA = .071 (acceptable model fit: RMSEA < .06), RMSR = .256 (acceptable model fit: RMSR < .06), TLI = .688 (acceptable model fit: TLI > .90), and CFI = .722 (acceptable model fit: CFI > .90; Bentler, 1990). These results indicate that the model is not acceptable for measuring burnout in this population (Albright, 2006-2008; Jackson et al., 2009).

We did a principal components factor analysis to explore the possible structure of the new construct in our sample. The KMO index was .80, which implies that it was appropriate to have performed an EFA and that the sample was large enough to produce reliable factors.

As shown in Table 2, two factors explained 83% of the variance. Factor loadings greater than .30 were considered to remain in each factor. Table 3 shows the factor loadings of each item. We did a varimax rotation to improve the interpretation of the data. In the EE factor, we obtained almost the same structure as in the original inventory, except for Item 12, which did not load to any factor, but when we picked a lower minimal loading value, it loaded with a negative value to the EE factor. The other observed differences were as follows: Item 10 and Item 22 did not load above the proposed cutoff; Item 11 and Item 15 loaded to the EE factor; and Item 5 loaded negatively to the PA factor. In the original construct, the DP factor is composed of only these five items, which means that in our new construct the DP factor does not appear.

DISCUSSION

The purpose of this study was to determine if the modified version of the MBI-HSS could be used to measure burnout in parents of children with trisomy 21 in Colombia. After a cognitive debriefing and a content validity analysis with satisfactory results, we performed a reliability test using a Cronbach’s alpha coefficient that showed that all items were interconnected and probably determined the same construct (Moret et al., 1993). When we calculated it for each

TABLE 2
Exploratory factor analysis (EFA): Principle components, unrotated factors

Factor	Eigenvalues	Difference	Cumulative
Factor 1 EE	4.77	2.54	0.57
Factor 2 PA	2.22	1.52	0.83
Factor 3 DP	0.70	0.14	0.92

Note. EE: Emotional exhaustion; PA: Personal accomplishment; DP: Depersonalization.

TABLE 3
Exploratory factor analysis (EFA): Rotated factor loadings (pattern matrix) and unique variances

Question of MBI	Factor 1 EE	Factor 2 PA	Uniqueness
Item 1	.77		0.45
Item 2	.68		0.55
Item 3	.69		0.51
Item 4		.63	0.63
Item 5	.22	-.35	0.78
Item 6	.66		0.55
Item 7		.42	0.83
Item 8	.87		0.29
Item 9		.72	0.52
Item 10	.25		0.91
Item 11	.52		0.67
Item 12	-.19		0.88
Item 13	.47	-.27	0.64
Item 14	.48		0.78
Item 15	.31	-.25	0.84
Item 16	.66		0.51
Item 17		.59	0.64
Item 18		.59	0.64
Item 19		.46	0.76
Item 20	.48		0.83
Item 21	-.15	.35	0.81
Item 22	.25		0.92

Note. EE: Emotional exhaustion; PA: Personal accomplishment.

factor, the coefficient of the DP factor was very low, indicating that the items that originally belonged to this factor did not fit together and that in our sample they did not determine the presence of DP.

In this study, we used the burnout construct of three components proposed by Maslach et al. (1997) instead of the one proposed by Pelsma et al. (1989) since there are differences between our population and the participants in Pelsma's study. The confirmatory factor analysis and the fit index analysis showed that the data did not adjust to the theoretical construct with three components, indicating that in populations similar to our participants the items are not able to diagnose the same tridimensional burnout syndrome proposed by Maslach. Then, we performed an exploratory factor analysis to find out how the structure of our construct really was. We found eigenvalues very similar to those found by Pelsma et al. and identified the EE and PA factors as well. These two factors were comprised of the same items as in Pelsma et al.'s validation. We observed that all five items of the DP factor loaded in the other two factors, in particular, four of the items loaded in the EE factor. This situation has been reported frequently in this type of MBI internal structure analysis (Worley, Vassar, Wheeler, & Barnes, 2008). These four items evaluated whether the parent had lost interest in the well-being of the child and whether he or she had become insensitive to the feelings of others. This could indicate that the parent does not depersonalize the child, but that exhaustion makes the parent feel unable to properly take care of the child. Furthermore, these results suggest that parents in our sample understood their lack of sensibility for others as being EE. The remaining item evaluated whether the parent saw his or her child as an impersonal object. This item loaded negatively in the PA factor. According to Procaccini and Kiefaber (1983), when parents acknowledge depersonalizing their child, this makes them feel that they are failing as parents. This could explain why this item negatively loaded to PA in this sample. Furthermore, our exploratory analysis showed that the two remaining factors, EE and PA, can explain 83% of the variance of the construct, so it is not clear whether the DP factor is necessary to identify the presence of parental burnout.

In some publications on parental burnout syndrome, DP is explained as a detachment of the parents from their children because of the extreme fatigue that is generated by their caregiving (Borgida, Zelop, Deroche, Bolnick, & Egan, 2003; Boström, Broberg, & Hwang, 2010; Bourke et al., 2008; Dabrowska & Pisula, 2010; Durmaz et al., 2011; Eisenhower, Baker, & Blacher, 2005; Esdaile, 2009). This suggests that, due to the bond that exists between parent and child, we should not determine the presence of depersonalization in this population using an inventory that was created to determine it in professionals, who do not have this kind of bond with their customers (Sloan & Cooper, 1986; Smith, 2011).

In our validation, we chose to analyze each parent individually because we found that the perception of exhaustion is dependent on the role of the parent in the child's upbringing. According to some authors (Barr, Simons, & Stewart, 2013; Cappelleri & Stecher, 2010; Driscoll, Schatschneider, McGinnity, & Modi, 2012; Herzberg, 2011; Ko & Shin, 2013; Oka & Whiting, 2013; Wittenborn, Dolbin-MacNab, & Keiley, 2013), given the origin of our data (couples of parents) we should have performed a dyadic analysis. One of the principles of a dyadic analysis is the homogeneity and the interdependence of the data. Although the correlation between parents could be the cause of the high correlation in Cronbach's alpha and KMO, it is unclear whether this can be identified as a possible cause of the findings in the confirmatory analysis. Another factor to consider was the way in which the information was acquired. The belated delivery of the questionnaires can be interpreted as a recollection bias.

Our final conclusion is that the burnout syndrome in parents of children with Down syndrome appears to be a different construct than the one developed by workers since the three

known factors that compose the burnout syndrome in workers could not be identified and probably the MBI-HSS is not completely adequate to identify this syndrome in parents. There remains an open question regarding the structure of burnout in parents. More precisely, further studies able to verify this syndrome as a two-factor structure are required. Qualitative studies are needed in order to redefine the construct of parental burnout and explore whether DP in parents is not just a severe stage of EE and lack of PA due to the caregiving demands.

NOTE

1. LR = the value of likelihood- ratio statistic for the goodness-of-fit test.

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