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CES PSICOLOGÍA

Artículo original

Psychometric Properties of the Spanish-language Version of the Interpersonal Mindfulness in Parenting (IM-P) Scale among Mothers of Preschool Children in Chile

Propiedades psicométricas de la versión en español de la Escala de Atención Plena (Mindfulness) Interpersonal en la Parentalidad en madres de preescolares en Chile

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Fecha correspondencia:
Recibido: septiembre 11 de 2020.
Aceptado: diciembre 20 de 2021.

Forma de citar:
Corthorn, C., Duncan, L.G., Manzi, J., & Pedrero, V. (2022). Psychometric Properties of the Spanish-language Version of the Interpersonal Mindfulness in Parenting (IM-P) Scale among Mothers of Preschool Children in Chile. *Rev. CES Psico, 15*(2), 44-60. https://dx.doi.org/10.21615/cesp.5820

Open access

Ética de publicaciones
Revisión por pares
Gestión por Open Journal System
DOI: 10.21615/cesp.5820
ISSNe: 2011-3080

Abstract

The Interpersonal Mindfulness in Parenting (IM-P) scale is one of the first measures that specifically assesses mindful parenting, a specific application of mindfulness, that has been defined as paying attention to your child and parenting in a particular way, intentionally, in the present moment, and non-judgmentally. Psychometric properties of a Spanish-language version of the IM-P scale were examined in a sample of 111 mothers of preschool-age children living in Santiago, Chile. The original IM-P model with five factors and 31 items showed indicators of goodness of fit within acceptable ranges, however two items presented extremely low factor loadings that suggest a lack of fit to the model. Also, there was a high correlation between two factors which were theoretical and conceptually very related: Compassion for the self and child and Non-judgmental Acceptance of the self and child. Therefore, it was considered appropriate to test a new four-factor model in which these two factors were merged into one, and items loading low in the previous model were eliminated. This new model showed a slightly better fit than the five-factor model. The resultant four-factor version and its subscales showed good internal consistencies. Construct validity of the IM-P scale

was investigated by calculating correlations with general mindfulness (Five Facet Mindfulness Questionnaire, FFMQ). As expected, a significant positive correlation was found between the two measures ($r=0.73$, $p<0.01$), and among almost all subscales. In general, the results present sound psychometric properties of the Spanish translation of the IM-P in Chilean mothers of preschool children.

Keywords: IM-P scale; mindful parenting; mindfulness; preschool children; psychometric analysis.

Resumen

Las propiedades psicométricas de la versión en español de la escala de Atención Plena (Mindfulness) Interpersonal en la Parentalidad (IM-P) fueron examinadas en una muestra de 111 madres de niños y niñas de edad preescolar en Santiago de Chile. La estructura de cinco factores de la escala IM-P original no fue completamente respaldada mediante análisis factorial confirmatorio. Por lo tanto, se testeó una estructura de cuatro factores. Dos de los factores encontrados fueron coherentes con aquellos originalmente hipotetizados. Los otros consistieron en una re-agrupación de items de las subescalas Consciencia Emocional de si misma y del hijo(a), Aceptación sin juicio de si misma y del hijo(a) y Compasión hacia si misma y hacia su hijo(a), en dos factores: uno que da cuenta de compasión y no-juicio de la madre hacia si misma y, el otro que da cuenta de la compasión, no-juicio y consciencia emocional de la madre hacia su hijio. La versión resultante de cuatro factores y sus sub-escalas presentaron buena consistencia interna. Se analizó la validez de constructo mediante cálculo de correlaciones con mindfulness general (Cuestionario de cinco dimensiones de Mindfulness, FFMQ). Como se esperaba, se encontró una correlación positiva significativa entre las dos medidas ($r=0.71$, $p<0.01$), y entre la mayor parte de las subescalas. En general, los resultados dan cuenta de buenas propiedades psicométricas de la versión en español de la escala IM-P en madres de niños y niñas preescolares en Chile.

Palabras clave: escala IM-P; mindfulness parental; mindfulness; edad preescolar; análisis psicométrico; atención plena.

Introduction

Research regarding the effects of parenting on child development and well-being is abundant. The scientific literature identifies parenting styles and practices that promote healthy development (Bradley & Caldwell, 1995). Neuroscience has revealed the importance of parent-child interactions not only for psychological development but also for brain development of the baby (e.g., Schore, 2005). Several parent characteristics such as stress (e.g., Belsky, 1984; Webster-Stratton, 1990), depression (Goodman & Gotlib, 2002; Murray, Kempton, Woolgar, & Hooper, 1993; Restifo & Bögels, 2009; Stein et al., 1991) and impulsiveness (Bögels, Hoogstad, van Dun, Schutter, & Restifo, 2008) can negatively affect parent-child interactions. Thus,

appropriate intervention programs to help parents improve their mental health levels and parenting skills are warranted.

Considering the abundant evidence about the positive effects of mindfulness in the general population it has been proposed that it is also a relevant construct for parent-child interactions, and that promoting mindfulness could be a way of increasing effectiveness of parenting interventions (Dumas, 2005). There is increasing evidence that support promoting mindfulness in parenting as a favorable intervention approach. (Altmaier & Maloney, 2007; Barrio, Martínez-Pampliega, & Merino, 2020; Burgdorff, Szabó, & Abbot, 2019; Coatsworth, Duncan, Greenberg, & Nix, 2010; Dawe & Harnett, 2007; Duncan & Bardacke, 2010; Erin et al., 2018; Kil & Antonacci, 2020; Gershy Meehan, Omer, Papouchis, & Sapir, 2017; Lewallen & Neece, 2015; Potharst, 2019; Singh, Lancioni, Winton, & Fisher, 2006; Singh, Lancioni, Winton, & Singh, 2007, Singh et al., 2010a, 2010b; Smit, Martens, Ackland, & Mikami, 2018; Vieten & Astin, 2008). Findings show evidence that including mindfulness in parenting interventions can result in reduced levels of stress, mood disorders and reactivity in parents, improved parental self-regulation, self-compassion, satisfaction levels and quality of the parent-child relationship, higher levels of empathy towards their children, reduced over-reactive parenting discipline, better family functioning, as well as lower levels of aggressive and externalizing behavior in the children.

As a specific application of mindfulness, mindful parenting has been defined as paying attention to your child and parenting in a particular way, intentionally, in the present moment, and non-judgmentally (Kabat-Zinn & Kabat-Zinn, 1997). Mindful parenting implies a specific way of parenting and, therefore, specific parenting skills. To measure and evaluate the effects of parenting interventions based on mindfulness, and to add scientific knowledge to this new emerging field, appropriate and psychometrically sound instruments for evaluating mindful parenting are needed.

The Interpersonal Mindfulness in Parenting (IM-P) scale (Duncan, 2007) is one of the first measures that specifically assesses mindful parenting instead of general mindfulness. The IM-P was initially developed in 2004 as a 10-item measure adapted from self-report questionnaires of mindfulness (Baer, 2004; Kentucky Inventory of Mindfulness Skills, KIMS; Brown & Ryan, 2003; Mindfulness Attention Awareness Scale, MAAS) and self-compassion (Neff, 2003; Self-Compassion Scale) available at that time. After elimination of two items, the 8-item version showed adequate reliability (α =0.72) and preliminary convergent and discriminant validity in relation to mindfulness and other parenting constructs was demonstrated (Duncan, 2007). In a pilot randomized controlled trial of their mindfulness enhancement of the Strengthening Families Program: For Parents and Youth 10-14 (Coatsworth et al., 2010), mindful parenting as measured with the original 10 item IM-P was shown to mediate effects on key outcomes of the program related to maternal and youth functioning.

The expanded 31-item version of the IM-P scale was developed as an effort to fully capture the five hypothesized dimensions of mindful parenting proposed by Duncan, Coatsworth and Greenberg (2009). The original short version of the IM-P scale (Duncan, 2007) included 4 subscales. To create the 31-item expanded version, additional items were added to all subscales and a 5th subscale, "Compassion for Self and Child" was added.

The psychometric properties of the 31-item IM-P scale were assessed in recent studies. Bruin et al. (2014) found good psychometric properties of the IM-P scale expanded version in a Dutch translation of it, with a sample of 1177 mothers of adolescents. The instrument showed good internal consistencies and a high correlation with general mindfulness questionnaires, with quality of life and optimism, and negatively with depression and dysfunctional parenting styles, results that support construct validity. The factor structure was somewhat different from the original IM-P. They found a six-factor structure. A main difference was that aspects of compassion and emotional awareness were grouped into distinct factors including aspects related to the mother herself and to the child, separately. Moreira and Canavarro (2017) conducted a study in a sample of 860 Portuguese parents. They found a five-factor structure for twenty-nine of the IM-P items, and emotional awareness of self as a parent did not form a separate factor. Ming Lo et al. (2018) conducted a study to validate IM-P scale in a sample of 837 Chinese parents from Hong Kong. They found a four-factor structure for the 23-item Chinese version. They found good internal consistencies and positive correlations with mindfulness, happiness, and mental health, and negative correlations with parental stress and depression, and child behavioral problems. Like Bruin et al.'s (2014) findings, Ming Lo et al. (2018) found regrouping of factors into mother-related and child-related aspects. A second Chinese study in Mainland China, found a four-factor structure with adequate internal consistencies. Significant correlations were found between IM-P scale Chinese version and over-reactivity, parental warmth, anxiety, depression, life satisfaction, and mindfulness. Finally, Kim et al. (2019) found good psychometric properties for an 18-item Korean version of the IM-P scale. Internal validity was confirmed, and the reliability score was adequate. Correlations were found in expected directions with self-compassion, depression, psychological well-being, and stress.

A Spanish-language version of the instrument has been developed by the IM-P scale author. In Chile, there are currently no measures available to assess mindful parenting, therefore in the current study we aimed to determine the validity of the Spanish-language version of the IM-P scale in this specific context. Therefore, the main objective of this study was to assess the psychometric properties of the IM-P scale in a sample of Chilean mothers of preschool children.

Methodology

Participants and procedure

The participants in this study were 111 mothers of preschool children (2 to 5 years old). The sample consisted primarily (93%) of women who worked at *Pontificia Universidad Católica de Chile* (Catholic University of Chile) whose children attended one of the three preschool centers of the University. Potential participants were contacted either through e-mail or through a letter sent from the child's preschool center. Seven percent of the participants were reached through an Internet software survey, and their children were attending private preschool centers in the city of Santiago. One child in the current sample was not attending a preschool center. The average age of the mothers was 35 years (SD=4.96). Most of them were either married or living with their partners (78.4%) and had on average two children (45.9% had two and 36% one child). 14.4% of them were single mothers and 7.2% were divorced or separated. They were mostly highly educated women, with 72.1% of them having a university degree and 22.5% having a technical (non-university-level) degree. Most of the fathers of the children also had a university degree (69.4%) or technical degree (19.8%). Regarding family income levels, most of the participants reported monthly salaries above or within Santiago Metropolitan Region's average, which is approximately US$ 2.000 (Instituto Nacional de Estadística, INE, 2013), with nearly half of the families (46.8%) falling between US$ 1.800 – US$ 5.400 per month and 22.5% above US$ 5.400. It is important to consider that the average income of the 10% richest households in Chile is around US$ 5.000, according to the same source. It is also relevant to notice that 30% of the participants of the present study reported monthly family income lower than regional average, some of them way below, showing variation within the sample.

Instruments

Interpersonal Mindfulness in Parenting (IM-P) Scale. The IM-P is a 31-item measure that assesses five hypothesized dimensions of mindful parenting proposed by Duncan and colleagues (2009) (Table 1). *Listening with full attention* (items 1,9,13,19,24) refers to listening to your child with focused attention and awareness of experiences in the present moment; *emotional awareness of self and child* (items 3,6,11,12,22,30) refers to the parent's ability to be aware of emotions within themselves as well as in their child; *self-regulation in parenting (*items 2,5,8,14,16,29) refers to parents minimizing behavioral reactivity to their child's behavior and adopting a style of more calmly selecting a parenting style without necessarily reacting immediately; *non-judgmental acceptance of self and child* (items 4,7,10,18,21,23,28) refers to the need for parents to become more aware of the (unconscious) expectations they often have of their parenting and their child's behavior and to gradually learn to adopt a more non-judgmental acceptance of both; and *compassion for self and child* (items 15,17,20,25,26,27,31) refers to developing a genuine stance of caring and compassion for the child as well as for themselves as parents (Duncan et al., 2009). (See more details about the IM-P in the "Introduction").

Table 1. Means, Standard Deviation, Skewness and Kurtosis of the IM-P items.

Number	Item	N	Mean	SD	Skewness	Kurtosis
1	Not listening to child with full attention	111	3,04	0,81	-0,07	-0,38
2	When upset with child, notice feelings before acting	109	3,61	0,93	-0,24	-0,46
3	Notice how changes in child mood affects mother's mood	110	3,95	0,92	-0,48	-0,67
4	Nonjudgmental listening to child	110	4,59	0,58	-1,08	0,21
5	React too quickly to child	111	2,80	0,86	0,31	-0,58
6	Aware of how link between own and parenting behavior	109	4,29	0,74	-1,09	2,34
7	Non-judgmental receptivity to child emotion	110	4,61	0,62	-2,29	9,18
8	Calmly tell child how feeling when upset	111	3,51	0,91	-0,19	-0,44
9	Rushing through activities with child	111	3,45	0,80	-0,22	-0,47
10	Trouble accepting child individuation	111	4,12	0,91	-0,75	-0,33
11	Emotions affect parenting	111	3,62	0,87	-0,67	0,46
12	Unaware of child's feelings	111	3,85	0,72	-0,82	1,99
13	Distracted while engaged with child	111	3,53	0,89	-0,49	0,08
14	Regretting parenting actions when upset	111	3,66	0,91	-0,59	0,24
15	Self-critical of parenting mistakes	111	2,65	1,12	0,02	-0,85
16	Effort to keep emotional balance when upset with child	111	3,79	0,82	-0,40	0,29
17	Self-blame during challenges with child	111	2,86	1,09	-0,07	-0,53
18	Acceptance of parenting challenges	111	3,87	0,75	-0,18	-0,39
19	Busy thinking, not listening to child	110	3,46	0,81	-0,20	-0,49
20	Forgiving self when regret parenting's actions	111	3,13	0,99	0,03	-0,33
21	Non-reactivity in difficult moments with child	111	3,50	0,83	-0,11	-0,03
22	Aware of child's worries	111	4,14	0,75	-0,77	0,72
23	Self-criticism of self as parent	111	3,25	1,11	-0,19	-0,65
24	Pay attention to child when together	111	4,12	0,74	-0,47	-0,15
25	Kind to child when upset	111	4,75	0,46	-1,45	0,85
26	Self-critical comparison with other parents	111	3,52	1,26	-0,41	-1,01
27	Caring for child when struggling	111	4,80	0,40	-1,54	0,36
28	Openness to child´s point of view	111	4,29	0,64	-0,34	-0,67
29	Emotional reactivity in response to child behavior	110	3,32	0,80	-0,21	0,40
30	Aware of child's unspoken feelings	111	4,11	0,73	-0,46	-0,11
31	Patient with child when struggling	110	4,50	0,67	-1,01	-0,18

Five-Facet Mindfulness Questionnaire (FFMQ). The FFMQ is a 39-item measure that assesses five mindfulness domains (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Scores range from 1=*Never or rarely* true to 5=*Very often or always true*, where higher scores reflect more mindfulness in five aspects. Subscale Observing (α=0.78) measures the tendency to notice or attend to internal and external experiences, such as emotions, cognitions, sights, and smells. Describing (α=0.90) measures the tendency to verbally describe and label these experiences. *Acting with awareness* (α=0.87) refers to bringing full awareness to current activity or experiences. *Non-judging* (α=0.82) refers to a non-evaluative stance toward inner experiences. *Non-reactivity* (α=0.79) measures the tendency to allow thoughts and feelings to come and go, without getting carried away by them. Construct validity of FFMQ has been extensively assessed in meditating and non-meditating sample (Baer et al., 2006, 2008). In Chile it has been found good reliability as well. Solari (2010) found cronbach alpha's score of 0.91 for the general scale, and 0.75 to 0.88 ranges for the five subscales. A more recent psychometric analysis in Chile found scores of α=0.79 for the general scale, and 0.62 to 0.86 ranges for the subscales. Also, evidence of convergent and discriminant validity, and differences between meditating and non-meditating samples were found (Schmidt & Vinet, 2015).

Statistical analyses

The structure of 5 factors of the IM-P scale was examined through confirmatory factor analysis. Given the nature of the response scale (i.e., Likert type) of the IM-P, the model was estimated from a polychoric correlations matrix using weighed least square mean and variance adjusted estimator (WLSMV), which does not assume distributional assumptions of the data. To evaluate the fit of the confirmatory model, four indicators of goodness of fit were used: Root Mean Square Error Aproximation (RMSEA), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Weighted Root Mean Square Residuals (WRMR). A good fit was considered if RMSEA ≤ 0.08, CFI and TLI ≥ 0.9 (Sun, 2005), and WRMR <1 (DiStefano, Liu, Jiang, & Shi, 2018). Internal consistency was examined through Cronbach's Alpha. Construct validity was examined by calculating Pearson correlations with general dispositional mindfulness as assessed through Five Facet Mindfulness Questionnaire. Correlations among the subscales of both measures were also analyzed. The standard errors for correlation analysis were estimated using Bias Correct Bootstrap. All estimations were performed in Mplus 8 and IBM SPSS 26.

Results

Factor structure

The original IM-P model with five factors and 31 items showed indicators of goodness of fit within acceptable ranges (RMSEA = 0.08, CFI = 0.9, TLI = 0.89, WRMR = 1.15). However, items 3 and 6 presented extremely low factor loadings that suggest a lack of fit to the model. Also, the modification indices suggest that item 21 had a strong relation with factor 3 (i.e., *Self-Regulation in Parenting Relationship*). The correlations between factors ranged from r = 0.48 for factors *Compassion for the Self and Child* and *Listening with Full Attention*, and r = 0.92 for

factors *Compassion for the Self and Child* and *Non-judgmental Acceptance of Self and Child* (Table 2).

Table 2. Confirmatory Factor Analysis (CFA) of IM-P in Chilean resident mothers' sample.

	CFA 1					CFA 2			
Item (#)	**F1 LFA**	**F2 EASC**	**F3 SRPR**	**F4 NJASC**	**F5 CSC**	**F1 LFA**	**F2 EASC**	**F3 SRPR**	**F4 NJA+CSC**
1	0,83					0,83			
9	0,80					0,80			
13	0,84					0,84			
19	0,90					0,89			
24	0,71					0,71			
3		0,11							
6		0,21							
11		0,75					0,75		
12		0,72					0,72		
22		0,83					0,82		
30		0,68					0,68		
2			0,75					0,75	
5			0,68					0,68	
8			0,77					0,77	
14			0,75					0,75	
16			0,72					0,72	
29			0,78					0,79	
4				0,52					0,56
7				0,40					0,43
10				0,31					0,33
18				0,48					0,52
21				0,62				0,70	
23				0,75					0,83
28				0,56					0,60
15					0,84				0,80
17					0,90				0,86
20					0,59				0,56
25					0,59				0,55
26					0,48				0,46
27					0,76				0,72
31					0,77				0,73
F1	1					1			
F2	0,63	1				0,64	1		

	CFA 1					CFA 2			
Item (#)	**F1 LFA**	**F2 EASC**	**F3 SRPR**	**F4 NJASC**	**F5 CSC**	**F1 LFA**	**F2 EASC**	**F3 SRPR**	**F4 NJA+CSC**
F3	0,59	0,61	1			0,58	0,60	1	
F4	0,66	0,82	0,9	1		0,54	0,74	0,65	1
F5	0,48	0,67	0,6	0,92	1	–	–	–	–
RMSEA			0,08					0,076	
CFI			0,90					0,912	
TLI			0,89					0,904	
WRMR			1,15					1,128	

LFA=Listening with Full Attention; EASC=Emotional Awareness of Self and Child; SRPR=Self- Regulation in Parenting Relationship; NJASC=Non-judgmental acceptance for self and Child; CSC=Compassion for Self and Child; NJA+CSC=Non-judgmental Acceptance and Compassion for Self and Child.

Given the conceptual and theoretical content of the *Compassion for the Self and Child* and *Non-judgmental Acceptance of Self and Child* factors, we decided to merge them into a single factor (*Non-judgmental Acceptance and Compassion for the Self and Child*). Based on these findings and considerations, a new model with four factors was specified, in which items 3 and 6 were eliminated due to their low load in the previous model and item 21 was included in factor 3. This new model showed a slightly better fit than the five-factor model (RMSEA = 0.076, CFI = 0.912, TLI = 0.904, WRMR 1.13). The correlation between factors ranged between 0.54 and 0.74. Since the magnitude of these correlations could indicate the presence of a single factor, a model of one factor and 29 items was fitted. The model with one factor did not show a good fit to the data (RMSEA = 0.111; CFI = 0.81; TLI = 0.796; WRMR = 1.5), therefore the solution with four factors was retained.

Internal consistency

Internal consistency based on 29 items was very good (α=0.92). Internal consistencies were α=0.86 for *Listening with Full Attention*; α=0.72 for *Emotional Awareness of Self and Child*; α=0.86 for *Self-Regulation in the Parenting Relationship*; and α=0.79 for the new subscale which include *Nonjudgmental Acceptance of Self and Child and Compassion for Self and Child*.

Construct validity

Construct validity of the IM-P Scale was investigated by calculating correlations with general mindfulness as it is measured by the Five Facet Mindfulness Questionnaire (FFMQ). As expected, the IM-P total score correlated positively with FFMQ total score (r=0.73, p<0.01). There was a significant positive correlation among almost all subscales of both measures (Table 3). The correlations values indicate that each scale was related but still measuring distinct constructs.

Table 3. Descriptive Statistics and Correlations of the IM-P (29 items) and FFMQ subscales and total score.

		Mean	SD	Min	max	Skewness	Kurtosis	1	2	3	4	5	6	7	8	9	10	11
1	IM-P	108,92	12,88	73	134	-0,34	-0,21	1										
2	IM-P Listening with Full	17,60	3,26	9	25	-0,27	-0,02	0,71**	1									
3	IM-P Emotional Awareness of Self and Child	15,72	2,23	10	20	-0,02	-0,16	0,77**	0,5**	1								
4	IM-P Self-Regulation in the Parenting Relationship	24,39	4,38	15	33	-0,13	-0,66	0,8**	0,45**	0,48**	1							
5	IM-P Nonjudgmental and Compassion of Self and Child	51,21	5,98	37	62	-0,14	-0,85	0,89**	0,47**	0,66**	0,57**	1						
6	FFMQ Total	132,84	21,10	70	176	-0,35	0,51	0,73**	0,55**	0,55**	0,54**	0,66**	1					
7	FFMQ Observing	26,58	7,03	10	61	1,04	4,99	0,25*	0,2*	0,22*	0,2	0,21*	0,49**	1				
8	FFMQ Describing	29,52	6,44	13	40	-0,17	-0,80	0,58**	0,44**	0,48**	0,36**	0,56**	0,79**	0,19	1			
9	FFMQ Acting with Awareness	27,38	6,48	8	40	-0,49	0,35	0,59**	0,62**	0,45**	0,39**	0,48**	0,79**	0,22*	0,62**	1		
10	FFMQ Non-judging	26,05	6,64	10	40	0,03	-0,32	0,59**	0,37**	0,38**	0,44**	0,6**	0,68**	-0,04	0,44**	0,53**	1	
11	FFMQ Non-reactivity	23,45	4,79	10	35	0,04	0,10	0,43**	0,25*	0,33**	0,49**	0,32**	0,61**	0,26*	0,45**	0,28**	0,25*	1

**. The correlation is significant at the 0.01 level (bilateral); *. The correlation is significant at the 0.05 (bilateral); Unless otherwise stated, the sampling simulation results are based on 1000 sampling simulation samples.

Each IM-P subscale had the highest correlation with the FFMQ subscale that was conceptually more related, the effect sizes ranged from moderate to strong. *Listening with Full Attention* had the highest correlation with the FFMQ subscale *Acting with Awareness* (r=0.62, p<0.001), which has similar items. As an example of the close conceptual relation among these subscales, item 8 of the FFMQ states "I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted" and item 13 of the IM-P scale states "When I am doing things with my child, my mind wanders off and I am easily distracted." *Self-regulation in Parenting Relationship* had the highest correlation with the FFMQ subscale *Non-reactivity to inner experience* (r=0.49, p<0.001). As an example of the relation among this subscales, item 4 of the FFMQ states "I perceive my feelings and emotions without having to react to them", and item 2 of the IM-P scale states "When I'm upset with my child, I notice how I am feeling before I take action." The new subscale *Nonjudgmental and Compassion for Self and Child* correlates with the FFMQ subscale *Non-judging of inner experience* (r=0.6, p<0.001). These subscales are clearly related. *Emotional Awareness of Self and Child* had the highest correlation with the FFMQ subscale *Describing* (r=0,48 p<0,01). These subscales are not as clearly related as the three previous ones. The relation could be that the subscale Describing generally refers to being able of putting into words what one feels and perceives, which implies a certain level of emotional awareness that would explain a higher correlation with *Emotional Awareness of Self and Child*.

Discussion

In general, the results of this study support the reliability and validity of the Spanish version of the IM-P Scale within a sample of mothers in Chile. Regarding the factor structure of the instrument in this sample, it was somewhat different from the original IM-P scale. For the analyzed sample, a 4-factor structure would be more appropriate than the original 5-factor structure. Three of the five factors originally proposed by Duncan (2009) remained almost without modification, while a fourth factor would include all the items that originally made up the *Nonjudgmental Acceptance of Self and Child* and *Compassion for Self and Child* subscales. It is important to note that in the present study two items were excluded because they presented extremely low factor loadings that suggested a lack of fit to the model. In addition, item 21 was included in a new factor. In this case, the decision was based on a statistical criterion and the evaluation of the item content. This version of the IM-P scale showed evidence of its reliability in the context analyzed. Additionally, the Chilean version of the IM-P scale showed an adequate correlation with the FFMQ, which provides evidence of construct validity.

Consistent with other studies that have addressed the psychometric properties of IM-P scale, it was not possible to replicate the original five-factor structure proposed by Duncan (2009). These findings suggested that the construct could be sensitive to the cultural environment in which the IM-P scale is applied as well as characteristics of the population in which it is used (i.e., people with frequent meditation practices vs. general population). Hence, results obtained in different parts of the world or with different samples may not be directly comparable. The stability of the psychometric properties of a measurement instrument across diverse

populations and cultural settings (i.e., invariance) is desirable (Pedrero & Manzi, 2020). However, this goal is difficult to achieve, even in contexts with great concern about it (e.g., large-scale tests) (Pedrero & Manzi, 2020). The differences in the factor structure of the IM-P as a complete instrument could motivate, for example, the search for specific items that could be invariant in different settings, a strategy which has been mentioned as an alternative in scales with invariance problems (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014).

Regarding internal consistency, considering previous studies that examined psychometric properties of IM-P scale had found reliabilities of α=0.89 (de Bruin et al., 2014), α= 0.85 (Lo et al., 2018), α = .88 (Pan, Liang, Zhou & Wang, 2019), it could be stated that reliabilities of this 29-item version of the IM-P scale were very good (α=0.92). Sub-scales reliabilities were good in general, with only one subscale with a lower but still acceptable Cronbach's alpha score (α=0.72 for *Emotional Awareness of Self and Child*).

Regarding construct validity, results of the correlations between IM-P scale and FFMQ indicate evidence that supports it. There was a significant positive correlation among both measures considering the total scores and among most of the subscales of both measures, with values that indicate that each scale was related but measuring distinct constructs. Support for subscales construct validity was also found since each IM-P subscale most highly correlated with the FFMQ subscale conceptually more related. FFMQ subscale related to general non-judgment was more correlated to IM-P subscale related to non-judgment of herself as a mother. FFMQ subscale related to non-reactivity was more correlated to IM-P subscale related to self-regulation in parenting. It could be hypothesized that a higher ability of being non-judgmental and non-reactive to inner experience (general mindfulness traits) would affect specific mindful parenting skills as measured by the IM-P scale. Acting with awareness (FFMQ) was more correlated to IM-P Listening with Full Attention subscales. A mother that is more aware and conscious of what she is doing in the present moment in general in her life, would probably be also more aware and conscious during the moments in which she is interacting with her child. Listening with Full Attention subscale not only refers to "listening" but also to being present and aware of the child during interactions with him or her. Describing (FFMQ) was more correlated to IM-P *Emotional Awareness of Self and Child*. As we already noted in the result section these subscales are not as clearly related as the three previous ones. The relation could be that the subscale Describing generally refers to being able of putting into words what one feels and perceives, which implies a certain level of emotional awareness that would improve the mother's awareness of her child's and own emotions.

We think it is relevant to note that FFMQ Observing subscale was the least related with IM-P subscales, showing low correlations values ranging from 0.2 to 0.49 (Pearson's r), one of them not even statistically significant. This is interesting because previous studies have shown that this subscale is also less related with the other FFMQ subscales. Although a five-factor structure emerged in the development of the FFMQ, Baer and colleagues (2006, 2008) found that a four-

factor hierarchical structure provided the optimal fit for the data when a student sample, community sample, and sample of highly educated adults were used (i.e., that all subscales except Observing/Noticing are key elements of an overarching mindfulness construct). The five-factor structure has been found to fit better on meditating samples, and four-factor structure fitting better on non-meditating sample (Williams, Dalgleish, Karl, & Kuyken, 2014). Since the present study's sample consist of general population (non-meditating) mothers, this finding is coherent with the cited results and it would explain why such low correlations were found among Observing subscale and IM-P.

In summary, the findings in this study show evidence that the IM-P scale has good psychometric properties within this sample and therefore its use in similar samples would be adequate. This study gives a first step in validating IM-P scale in its Spanish translation. Besides adding evidence regarding construct validity of the IM-P scale, these results also add evidence that support the proposal that increasing mindfulness levels in mothers would positively affect their way of parenting their children, already pointed out by several authors (e.g. Dumas, 2005; Duncan, Coatsworth, & Greenberg, 2009).

Future research would be necessary to add more evidence regarding reliability and validity of this IM-P scale version within Spanish speaking samples of different cultural and economic background. It would also be relevant to further assess psychometric properties of the IM-P scale in samples of mothers of preschool children (not only in Spanish speaking samples), since to our knowledge this is the first study that analyzes psychometric properties of IM-P scale regarding this specific age range. Research is also needed to corroborate if mindful parenting measured by this IM-P scale version would mediate improvement in parent-child interactions, as an effect of parenting interventions that include mindfulness, as has been found on previous studies (Coatsworth et al., 2010). Finally, research is needed regarding effects of mindful parenting intervention on IM-P measures in Spanish speaking samples.

Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical approval

All procedures performed in the present study were approved by the ethical committee of the School of Psychology of *Pontificia Universidad Católica de Chile* (Catholic University of Chile), and in accordance with the 1964 Helsinki declaration and its later amendments.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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