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ORIGINAL PAPER

Validating of the Interpersonal Mindfulness in Parenting Scale in Hong Kong Chinese

Herman Hay Ming Lo[1] · Jerf Wai Keung Yeung[2] · Larissa G. Duncan[3] · Ying Ma[4] · Angela Fung Ying Siu[4] · Stanely Kam Chung Chan[5] · Chun Wah Choi[1] · Miu Ping Szeto[5] · Ken King Wo Chow[4] · Siu Man Ng[6]

Abstract
Mindfulness-based interventions are increasingly being used in parent training and family-based programs to improve family well-being. The Interpersonal Mindfulness in Parenting (IM-P) scale was adopted as a measure to investigate the quality of interpersonal mindfulness in parenting. We conducted a study to validate IM-P in Hong Kong Chinese community samples. In this study, $n = 837$ Chinese parents were recruited. Using a random sampling procedure, sample A ($n = 419$) was used for Parallel Analysis and Exploratory Factor Analysis, and sample B ($n = 418$) was used for Confirmatory Factor Analysis. We confirmed a four-factor structure for the 23-item Chinese version of the IM-P scale, which included Compassion for Child, Nonjudgmental Acceptance in Parenting, Emotional Awareness in Parenting, and Listening with Full Attention. The IM-P was found to have negative moderate correlations with parental depression and stress, and child behavioral problem. It also showed moderate positive correlations with parental mindfulness, happiness, and mental health, but no correlations with physical health, and positive religious coping. The unique factor structure in Hong Kong Chinese samples was discussed. Result of this study indicated that the IM-P scale is a valid measure among Chinese populations but more studies are recommended to evaluate the psychometric properties and utility of the Chinese version of the IM-P.

Keywords Mindful parenting · Interpersonal mindfulness · Validity

Introduction

Although there are some shared values and attitudes that parents possess and adopt to socialize their children with, such as love and warmth, how they perform and communicate these to their children varies in different cultures (Darling and Steinberg 1993; Lo et al. 2017b; Yeung 2016; Yeung et al. 2017). For instance, in China, it has been widely acknowledged that "guan" (to govern) and "xun" (training) are indigenous practices of traditional Chinese parenting (Chao 1994). Confucianism provides a philosophical basis and structure for traditional Chinese parenting practice. Chinese parents expect children to be obedient and respectful and parents are expected to be responsible and serve as a life coach who passes along social norms, values, and life experiences to children (Ho 2000). In China, child behaviors are expected to be regulated within well-defined duties, obligations, and rules, and as such, less personal space is allowed for avoiding interpersonal conflict (Shek and Sun 2014).

While Chinese families across the world are still largely influenced by these traditional parenting practices, a Western, child-centered approach has gradually been infused in contemporary child rearing, particularly among more highly educated Chinese populations (Xu et al. 2014). Recent studies report that Chinese families do not endorse harsh parenting, and show high levels of warmth and engagement in training their children, which includes using a mixture of control, support, care, and concern (Shek and Sun 2014; Xu et al. 2005). In light of these changes in parenting practices and beliefs, it has not been determined if parenting measures

✉ Herman Hay Ming Lo
herman.lo@polyu.edu.hk

[1] Hong Kong Polytechnic University, Hung Hom, Hong Kong
[2] City University of Hong Kong, Kowloon Tong, Hong Kong
[3] University of Wisconsin-Madison, Madison, WI, USA
[4] Chinese University of Hong Kong, Shatin, Hong Kong
[5] Heep Hong Society, Hong Kong, Hong Kong
[6] University of Hong Kong, Pok Fu Lam, Hong Kong

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developed in Western contexts are appropriate for use in Chinese culture (Shek and Sun 2014).

Mindful parenting (MP) is an emerging concept that refers to parenting in which practices and principles of mindfulness are integrated into parents' thoughts, feelings, and behaviors. In particular, attitudes of compassion, acceptance, and kindness are emphasized in interactions with children (Bögels and Restifo 2014; Duncan et al. 2009; Kabat-Zinn and Kabat-Zinn 1994). Although it is possible to use behavioral observation to assess MP (Duncan et al. 2015), it is more common and convenient to use self-reported measure in this area of study. Duncan (2007) developed a brief 10-item self-report measure of mindful parenting that was expanded to encompass five theorized dimensions of MP (Duncan et al. 2009) in the construction of a 31-item Interpersonal Mindfulness in Parenting (IM-P) scale: (1) listening with full attention to the child, (2) non-judgmental acceptance of the self and the child, (3) emotional awareness of the self and the child, (4) self-regulation in the parenting relationship, and (5) compassion for the self and the child. The IM-P has been shown to be sensitive to intervention change (Coatsworth et al. 2010, 2015).

The psychometric properties of the 31-item IM-P were studied in two published studies recently. The first was based on three samples of 1177 mothers in the Netherlands (de Bruin et al. 2014a). It was found that 29 items of the IM-P formed a six-factor structure, with emotional awareness of child, and emotional awareness of oneself as a parent separating into two distinct factors. Later, a second study was conducted on three samples of 860 Portuguese parents (Moreira and Canavarro 2017). Twenty-nine items of IM-P formed a five-factor structure, and the emotional awareness of self did not form a separate factor. Such findings suggested that more empirical studies are required to further investigate the measurement of MP.

Further research on MP using the brief IM-P has shown that MP is negatively correlated with parental depression, child internationalizing problems, and child externalizing problems, but not with observed positive or negative parenting (Parent et al. 2010). Another study found an indirect but significant effect between MP and adolescent substance use. It has also been suggested that MP might be helpful in promoting positive interactions within the family context (Turpyn and Chaplin 2016) and that it is related to youth disclosure that supports parental monitoring (Lippold et al. 2015). A model of MP and youth psychopathology was tested in which parent dispositional mindfulness was indirectly related to youth internalizing and externalizing problems, through negative parenting practices and MP (Parent et al. 2015).

Other studies used the full, extended version of the IM-P. A study of 28 parents of children diagnosed with autistic spectrum disorder (ASD) found that higher levels of MP were associated with lower depressive symptoms and stress. Although MP did not mediate the relation between behavioral problems and parental distress, an important role for the dimension of self-compassion in parenting was demonstrated (Beer et al. 2013). Finally, a study of a sample of 901 adolescents and their parents investigated the relationship between MP and adolescent's internalizing symptoms. Among all dimensions of MP, it was found the non-judgmental acceptance factor was the sole statistically significant predictor (Geurtzen et al. 2014).

Mindfulness-based intervention research with families is growing. A pilot randomized controlled trial (RCT) with 65 families comparing the outcome of Mindfulness-enhanced Strengthening Families Program: For Parents and Youth (MSFP), the original Strengthening Families Program: For Parents and Youth (SFP), and the waitlist control group. MP was found to be the mediator of beneficial MSFP program effects on outcomes of discipline consistency, anger management, and mother's negative affect and behavior towards youth (Coatsworth et al. 2010). Another mindful parenting program was delivered to 29 parents and their children with ASD. MP significantly increased at post-test and follow-up (de Bruin et al. 2014b). In another, quasi-experimental study conducted to investigate the effects of a mindful parenting program in a psychiatric population ($n = 70$ parents), a significant improvement in parent interpersonal mindfulness was found and it predicted improvements in child psychopathology (Meppelink et al. 2016). However, not all studies of MP reported similarly straight-forward results. A large-scale RCT involving 432 families compared MSFP, SFP, and an information-only control condition. Fathers from MSFP reported higher emotional awareness of the child, more compassion and acceptance for their children and themselves, and better listening with full attention than fathers did in the SFP. Mothers from MSFP showed greater support and understanding than mothers from SFP, as reported by youth. However, similar increases in MP were found among mothers from the SFP but were not found in mothers from the MSFP, suggesting greater benefits for fathers on MP (Coatsworth et al. 2015).

For MP to be studied across different cultural contexts, the measurement of MP must be validated in different languages. In addition, more work is needed to refine the construct and measurement of mindful parenting. First, the hypothesized subdimensions of MP warrant more empirical investigation as there has been only one published validation study of the IM-P in the Netherlands. More studies are required to investigate if this parenting measure that was developed in the English language in the USA is valid for Chinese populations. Second, mindfulness practices originated from Eastern religious traditions, but none of the studies noted are based on Asian populations. Conceptualizations of "good" parenting are largely related to culturally specific socialization processes (Bornstein 2012), and it is uncertain that a MP approach constructed by Western researchers can be used to assess parenting practice in the East. Third, most studies assessing MP are based on

samples of adolescent's parent, except Geurtzen et al. (2014) and Laurent et al. (2017). In the latter's study, mothers with higher level of MP showed steeper cortisol recovery slopes and MP moderated the effects of life stress on mother and infant cortisol levels (Laurent et al. 2017). More research should be conducted on MP across the family life cycle.

In this study, we assessed the psychometric properties of the Chinese translation of the IM-P self-report scale among Hong Kong Chinese parents. The overall reliability and validity of the scale, and factor structure were investigated using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). We also validated the measure in relation to a variety of relevant constructs. We hypothesized that the IM-P would be positively related with parental dispositional mindfulness, happiness, and family functioning, and negatively associated with parental stress, depression, and child behavioral problem.

Method

Participants

This study was based on a grand sample of 837 parent participants of preschool, primary school, or secondary school children that were pooled by three individual samples. All participants were recruited with the help of five non-governmental organizations (NGOs), primary and secondary schools, respectively. A cover letter, a consent form, and the questionnaire were distributed to parents. An inclusion criterion for this study was that all participants were required to have at least one child who was living with them at the time of questionnaire completion. Parents participated on a voluntary basis without incentive payment. They were asked to return the completed questionnaires and consent form in two separate envelopes to assure anonymity.

Sample 1 included parents of preschool children ($n = 394$) who were requested to fill the full 31-item version of the IM-P (Duncan 2007), the Eyberg Child Behaviour Inventory (ECBI; Eyberg and Ross 1978), the Parenting Stress Index Short Form (PSI-SF; Abidin 1990), the Intrinsic Religious Orientation subscale of the Religious Orientation Scale-Revised (ROS-R; Gorsuch and McPherson 1989), and the Brief Measure of Religious Coping (PRCOPE; Pargament et al. 1998). Sample 2 included parents of primary school children ($n = 242$) and a questionnaire with the full version of the IM-P and the Mindful Attention Awareness Scale (MAAS; Brown and Ryan 2003), and the 12-item General Health Questionnaire (GHQ-12; Golderberg and Williams 1988) were given to these parents. Sample 3 included parents of secondary school children ($n = 201$), and they completed the full version of the IM-P; the Family Adaptation, Partnership, Growth, Affection, Resolve Scale (APGAR; Smilkstein et al. 1982); the Subjective Happiness Scale (SHS; Lyubomirsky and Lepper 1999); and the 12-Item Short Form Health Survey (SF-12; Ware et al. 1995).

Among the grand sample of 837 parent participants, the majority (82.3%) were mothers. Most of them (90.6%) were married and above half (53.0%) had a full time job. Over three quarters (78.5%) attained an education level of secondary school or above. The mean age of their children was 7.59 (SD = 3.85). Participant demographics are shown in Table 1.

Two independent samples, samples A and B, were drawn by a random sampling procedure in SPSS with a normal distribution with zero mean and a standard deviation of one. Sample A, which consists of 50% of the grand sample ($n = 419$), was used for Exploratory Factor Analysis (EFA), and sample B, which consist of the second half of the grand sample ($n = 418$), was used for Confirmatory Factor Analysis (CFA) subsequently.

Procedures

The Chinese version of the IM-P Scale was created with the permission of the original author of the IM-P Dr. L. Duncan, and translated from English-language version by a clinical psychologist with a Doctoral degree in psychology and an extensive personal practice of mindfulness meditation. The first draft was revised through a consensus process conducted by the first, second, and the sixth authors. A back translation check was done by a research assistant who had an undergraduate degree in psychology and was endorsed by the author of the original English-language version.

This study was approved by the university research office ethics committee of the first author.

Measures

Eyberg Child Behaviour Inventory (ECBI) This is a widely used 36-item scale used to assess parent perception of disruptive behavior of their children. The ECBI has two sub-scores: a "Problem Score" measuring the extent to which parents are troubled by their children's disruptive behaviors (scored dichotomously as 0 or 1), and an "Intensity Score" assessing parents' ratings of the intensity of various problem behaviors on a seven-point scale. The Chinese version has been validated for use with Hong Kong Chinese parents by Leung et al. (2003). In this present study, the inter-coefficients were 0.93 for "Problem Score" and 0.93 for "Intensity score."

Parenting Stress Index Short Form (PSI-SF) This 36-item inventory was developed by Abidin (1990) to assess the perceived sources of difficulties and levels of parenting stress experienced by parents using a five-point response scale. It has three sub-scales: parental distress, parental-child dysfunctional interaction, and difficult child. The Hong Kong Chinese version was validated

Table 1 Demographics of study 1 participants ($n = 837$)

	Frequency	%
Relations with child		
Mothers	689	82.3
Fathers	148	17.7
Age of parents		
< 20	3	0.4
21–30	52	6.2
31–40	487	58.2
41–50	258	30.8
51–60	35	4.2
> 60	2	0.2
Marital status		
Married	758	90.6
Separated/divorced	56	6.7
Deceased	8	1.0
Unmarried	15	1.8
Occupation		
Home making	307	36.7
Full time/self-employed	444	53.0
Part-time	69	8.2
Unemployed	17	2.0
Education		
No formal education	15	1.8
Primary	165	19.7
Secondary	436	52.1
Tertiary or above	221	26.4
Child age		
2	11	1.3
3	65	7.8
4	67	8.0
5	153	18.3
6	146	17.4
7	119	14.2
8	50	6.0
9	13	1.6
10	11	1.3
11	18	2.2
12	58	6.9
13	15	1.8
14	59	7.0
15	13	1.6
16	18	2.2
17	12	1.4
18	7	0.8
19	2	0.2

by Lam (1999). The Cronbach's alphas were 0.93 for the total score, and 0.89, 0.80, and 0.90 for three subscales respectively in this study.

Mindful Attention Awareness Scale (MAAS) This 15-item inventory was developed by Brown and Ryan (2003) to assess the core characteristic of mindfulness, which was a receptive state of mind, informed by sensitive awareness of the present moment using a six-point response scale. The Chinese version was validated by Black et al. (2012) and Deng et al. (2012). The Cronbach's alpha was 0.90 in this study.

12-item General Health Questionnaire (GHQ-12) This 12-item inventory was developed by Golderberg and Williams (1988) to assess participants' general mental health through identifying minor psychiatric symptoms using a four-point response scale. The Chinese version was validated by Shek (1989). The Cronbach's alpha was 0.88 in this study.

Family Adaptation, Partnership, Growth, Affection, Resolve Scale (APGAR) This 5-item inventory was developed by Smilkstein et al. (1982) to assess participants' satisfaction of family functions using a three-point response scale. The Cronbach's alpha was 0.84 in this study.

Subjective Happiness Scale (SHS) This four-item inventory was developed by Lyubomirsky and Lepper (1999) to assess participants' subjective happiness using a seven-point response scale. The Chinese version was validated by Nan et al. 2014. The Cronbach's alpha was 0.74 in the current study.

12-Item Short Form Health Survey (SF-12) This 12-item inventory was developed by Ware et al. (1995) to assess participants' mental health and physical health. The Cronbach's alpha was 0.75 in the current study.

Intrinsic Religious Orientation Subscale of the Religious Orientation Scale-Revised (ROS-R) This subscale consisted of eight items and measured participant's intrinsic religiosity (Gorsuch and McPherson 1989).

Brief Measure of Religious Coping (Brief PRCOPE) This seven-item measure investigated participant's positive religious coping (Pargament et al. 1998). Both ROS-R and PRCOPE were selected to explore whether these variables of parental religious involvement overlaps with MP. They had been used in a study of family religiosity for Chinese (Yeung and Chan 2014). The Cronbach's alpha of the ROS-R and PRCOPE were 0.88 and 0.90 in this study.

Data Analyses

A two-stage factor analysis approach was adopted to examine the factor structure of the Chinese version of IM-P. Based on sample A, parallel analysis (PA) was conducted to determine the number of factors. SPSS syntax developed by O'Connor

(2000) was used to calculate the mean and the 95th percentile for each of the eigenvalues of 100 randomly generated data sets. The number that real-data eigenvalues from a principal component analysis (PCA) exceeded random data eigenvalues was the criterion to determine the number of factors to be extracted. EFA by maximum likelihood was then performed, in which Promax rotation was applied to let the extracted factors be correlated with each other, as theoretically, factors of a latent construct should ideally be interrelated. The use of maximum likelihood for factor extraction is preferable to principal components analysis, as the former can estimate weights for the variable items on factors to maximize the probability of having sampled the correlation matrix from a multivariate normally distributed population than the latter approach.

Sample B was used to perform CFA in order to further validate the identified factor structure from the EFA. Modification index analyses were used to manage cross-loading and improve the model. All data analyses were performed by SPSS 22.0. Cronbach's alphas were computed to determine the internal consistency of the Chinese version of IM-P. Convergent and divergent validity were further examined by calculating the inter-correlations of mindfulness, parental stress, family functioning, child behavior problem, happiness, depression, psychiatric well-being, mental health and physical health, and parental religious involvement.

Results

Factor Structure of the Chinese Version of the IM-P

To decide on the number of factors, a PA was conducted. The results were shown in Table 2 and a four factor model was suggested. Four eigenvalues of the real dataset exceeded random values, so a four-factor EFA was followed. EFA by maximum likelihood was then performed, in which Promax rotation was applied.

Table 3 shows the four factor-solution of the scale. Items 3, 4, 5, 6, 7, 10, 12, and 15 were excluded due to low inter-item reliability and double loading. Results of this 23-item, 4-factor EFA explained 41.72% of the variance. In addition, both a high Kaiser-Meyer-Olkin value, KMO = .89, and significant Bartlett's test, $X^2 = 3177.72$, $p < 0.001$, suggested sampling and correlation adequacy for the factoring procedure. Seven items loaded significantly on the first factor, which involved all items of the Compassion for Child subscale in the Dutch validation study, so our first factor was named Compassion for Child (CC). Six items loaded on the second factor, which involved all items of Emotional Awareness of Self in the Dutch study, so our second factor was named Emotional Awareness in Parenting (EAP). In addition, six items loaded on the third factor, which significantly overlapped with items of Non-judgmental Acceptance of Parental Functioning in the Dutch study, so our second factor was named Nonjudgmental Acceptance in Parenting (NJAP). Finally, four items loaded significantly on the fourth factor, which were almost identical with items from the Listening with Full Attention subscale in the Dutch study, and therefore the term Listening with Full Awareness (LFA) was used.

Table 2 Parallel analysis ($n = 419$)

Eigenvalues	Random means	Random 95 percentile	Real data
1	1.37	1.42	6.60
2	1.33	1.37	4.55
3	1.29	1.32	1.58
4	1.26	1.29	1.30
5	1.23	1.25	1.21
6	1.20	1.22	1.04

Subsequently, a CFA was conducted to verify the psychometric properties of the newly generated IMP scale in this sample of Chinese parents. The initial CFA model with all items loading on their respective latent factor obtained in EPA analysis showed a less optimal data-model fit, $X^2 = 460.17$, df = 224, $p < 0.001$, GFI = 0.91, CFI = 0.92, RMSEA = 0.05 (model 1 in Table 4). Modification index (MI) analyses indicated setting free the covariances between residuals of items 17 and 23, items 22 and 30, and items 27 and 28. This residual-covariance model (model 2) attained a good data-model fit, $X^2 = 402.63$, df = 221, $p < 0.001$, GFI = 0.92, CFI = 0.94, RMSEA = 0.04, in which model comparison supported rejection of model 1 in favor of model 2. Figure 1 shows the results of model 2 as our final best fit CFA model.

Construct Validity of the Chinese Version of the IM-P

Table 5 shows the correlation coefficients of the total score and four factors of the Chinese version of the IM-P with other variables. As expected, the IM-P total score and the four factors were positively correlated with general dispositional mindfulness as measured with the MAAS (total score: $r = 0.59$, $p < 0.001$; CC: $r = 0.37$, $p < 0.001$; NJAP: $r = 0.59$, $p < 0.001$; EAP: $r = 0.26$, $p < 0.001$; LFA: $r = 0.55$, $p < 0.001$), family functioning (total score: $r = 0.40$, $p < 0.01$; NJAP: $r = 0.37$, $p < 0.01$; EAP: $r = 0.39$, $p < 0.01$; LFA: $r = 0.28$, $p < 0.05$), subjective happiness (total score: $r = 0.51$, $p < 0.001$; CC: $r = 0.27$, $p < 0.05$; NJAP: $r = 0.53$, $p < 0.001$; EAP: $r = 0.40$, $p < 0.01$; LFA: $r = 0.28$, $p < 0.05$), psychiatric well-being (total score: $r = 0.54$, $p < 0.001$; CC: $r = 0.27$, $p < 0.001$; NJAP: $r = 0.57$, $p < 0.001$; EAP: $r = 0.28$, $p < 0.001$; LFA: $r = 0.40$, $p < 0.001$), mental health (total score: $r = 0.53$, $p < 0.001$; CC: $r = 0.30$, $p < 0.05$; NJAP: $r = 0.57$, $p < 0.001$; EAP: $r = 0.34$, $p < 0.01$; LFA: $r = 0.42$,

Table 3 Factor loadings of EFA by maximum likelihood ($n = 419$)

		Factor 1 CC	Factor 2 NJAP	Factor 3 EAP	Factor 4 LFA
31	Patient with child when struggling	*0.81*	0.06	0.46	0.23
27	Caring for child when struggling	*0.78*	0.04	0.49	0.22
28	Openness to child's point of view	*0.68*	− 0.02	0.41	0.19
25	Kind to child when upset	*0.66*	0.19	0.54	0.41
24	Pay attention to child when together	*0.57*	0.06	0.39	0.45
22	Aware of child's worries	*0.53*	− 0.01	0.37	0.08
30	Aware of child's unspoken feelings	*0.52*	0.09	0.32	0.18
23	Self-criticism of self as parent	0.03	*0.68*	0.10	0.32
29	Emotional reactivity in response to child behavior	0.02	*0.66*	0.28	0.48
14	Regretting parenting actions when upset	0.12	*0.63*	0.27	0.53
17	Self-blame during challenges with child	− 0.03	*0.62*	0.00	0.34
26	Self-critical comparison with other parents	0.19	*0.54*	0.19	0.37
11	Emotions affect parenting	0.02	*0.51*	0.17	0.48
16	Effort to keep emotional balance when upset with child	0.38	0.32	*0.73*	0.29
21	Non-reactivity in difficult moments with child	0.45	0.02	*0.66*	0.20
20	Forgiving of self when regret parenting actions	0.44	− 0.09	*0.60*	0.14
18	Acceptance of parenting challenges	0.53	0.03	*0.57*	0.09
2	When upset with child, notice feelings before acting	0.36	0.15	*0.53*	0.10
8	Calmly tell child how feeling when upset	0.41	0.09	*0.52*	0.17
13	Distracted while engaged with child	0.20	0.47	0.21	*0.68*
19	Busy thinking, not listening to child	0.13	0.45	0.00	*0.64*
1	Not listening to child with full attention	0.10	0.30	0.16	*0.54*
9	Rushing through activities with child	0.13	0.28	0.13	*0.47*

Kaiser-Meyer-Olkin value (KMO) = 0.88; Bartlett's test, $X^2 = 3177.72$, df = 253, $p < 0.001$

CC compassion for child, *NJAP* nonjudgmental acceptance in parenting, *EAP* emotional awareness in parenting, *LFA* listening with full attention

Italics indicated that such item had the highest loading in this factor

$p > 0.01$). IM-P was low correlations with physical health (total score: $r = -0.03$, $p > 0.05$; CC: $r = -0.14$, $p < 0.05$; NJAP: $r = 0.07$, $p > 0.05$; EAP: $r = 0.00$, $p > 0.05$; LFA: $r = -0.03$, $p > 0.05$), intrinsic religious orientation (total score: $r = 0.22$, $p < 0.01$; CC: $r = 0.20$, $p < 0.01$; NJAP: $r = 0.09$, $p > 0.05$; EAP: $r = 0.27$, $p < 0.01$; LFA: $r = 0.07$, $p > 0.05$), and positive religious coping (total score: $r = 0.12$, $p > 0.05$; CC: $r = 0.18$, $p > 0.05$; NJAP: $r = -0.01$, $p > 0.05$; EAP: $r = 0.18$, $p > 0.05$; LFA: $r = -0.06$, $p > 0.05$).

In order to test predictive validity of the IM-P, regression analyses were conducted. Table 6 shows that, after controlling for child age, parent age, gender, and marital status, the IM-P total score and four factors negatively predicted parental stress total score (total score: $\beta = -1.08$, $p < 0.001$; CC: $\beta = -1.28$, $p < 0.001$; NJAP: $\beta = -2.38$, $p < 0.001$; EAP: $\beta = -1.66$, $p < 0.001$; LFA: $\beta = -2.82$, $p < 0.001$), parental distress (total score: $\beta = -0.41$, $p < 0.001$; CC: $\beta = 2.45$, $p < 0.001$; NJAP: $\beta = 2.23$, $p < 0.001$; EAP: $\beta = -1.92$, $p < 0.01$; LFA: $\beta = -1.11$, $p < 0.05$), stress from parent-child dysfunctional interaction (total score: $\beta = -0.35$, $p < 0.001$; CC: $\beta = 1.31$, $p < 0.01$; NJAP: $\beta = 0.88$, $p < 0.05$; LFA: $\beta = -1.21$, $p < 0.05$; but not EAP: $p > 0.05$), and stress from perceiving the child as difficult (total score: $\beta = -0.32$, $p < 0.001$; CC: $\beta = 1.64$, $p < 0.01$; NJAP: $\beta = 1.89$, $p < 0.001$; EAP: $\beta = -1.31$, $p < 0.05$; LFA: $\beta = -1.21$, $p < 0.05$). In addition, the IM-P total score and the factors significantly predicted family functioning (total score: $\beta = 0.10$, $p < 0.01$; NJAP: $\beta = 0.25$, $p < 0.01$; EAP: $\beta = 0.26$, $p < 0.01$; but not CC nor LFA: $p > 0.05$), child behavioral

Table 4 Model fit indices and model comparison measures from model modifications ($n = 419$)

Model	X^2	df	p	X^2/df	GFI	CFI	RMSEA	AIC	BCC	ΔX^2(df)
CFA of new structure (model 2)	460.17	224	< 0.001	2.05	0.91	0.92	0.05	564.17	570.52	487.18 (85)***
CFA of new structure with residual covariances (model 3)	402.63	221	< 0.001	1.82	0.92	0.94	0.04	512.63	519.34	57.54 (3)***

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

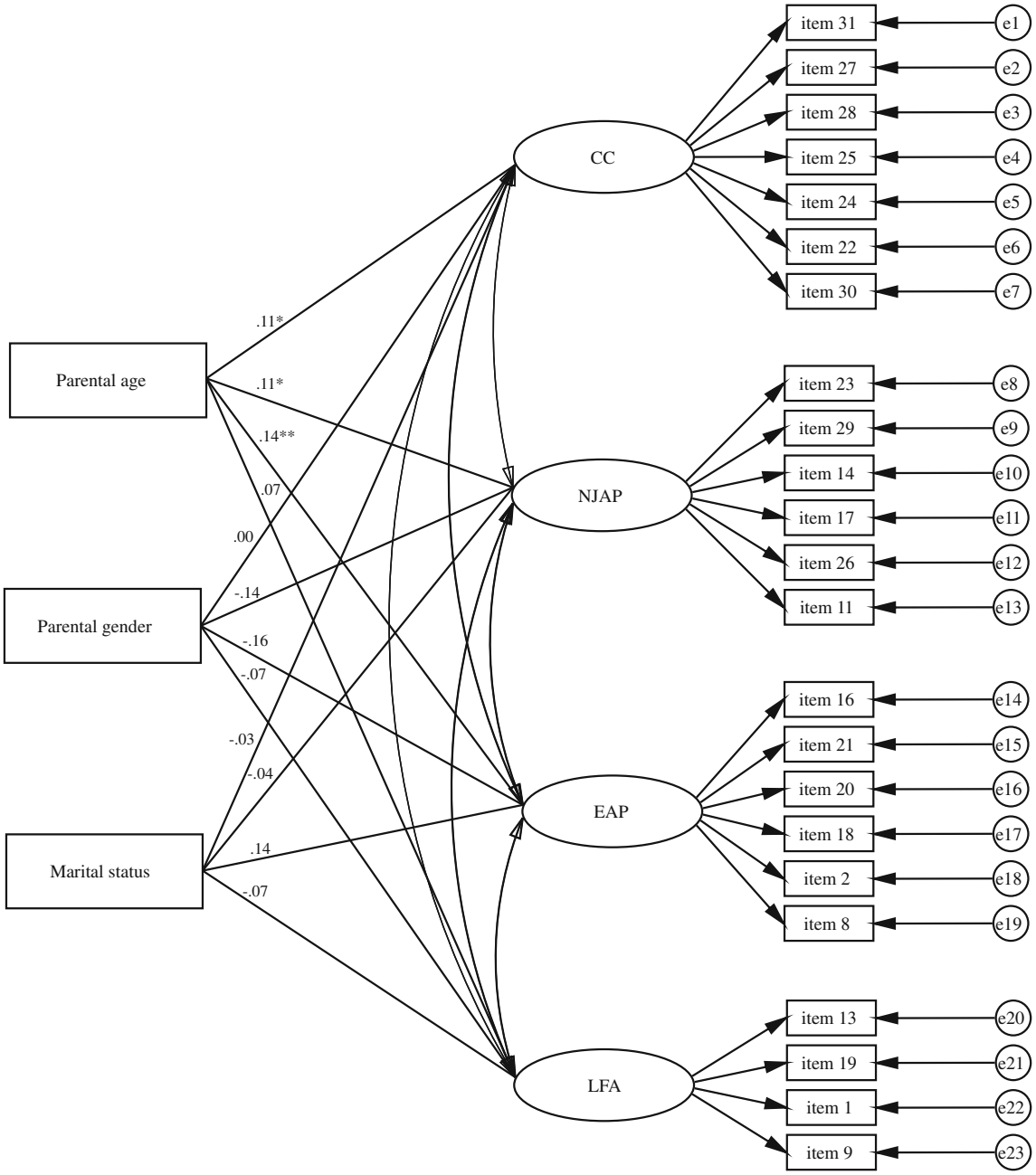

Fig. 1 Multiple indicators multiple causes (MIMIC) modeling by regressing parental age, parental gender, and marital status ($n = 418$). Model Fit Indexes, $X^2 = 541.37$, df = 281, $p < 0.001$, GFI = 0.91, CFI = 0.91, RMSEA = 0.05. *$p < 0.05$, **$p < 0.01$ *CC* compassion for child, *NJAP* nonjudgmental acceptance in parenting, *EAP* emotional awareness in parenting, *LA* listening with awareness

problems (total score: $\beta = -0.27$, $p < 0.001$; CC: $\beta = -0.31$, $p < 0.05$; NJAP: $\beta = -0.64$, $p < 0.001$; EAP: $\beta = -0.38$, $p < 0.05$; LFA: $\beta = -0.98$, $p < 0.001$), and their intensity (total score: $\beta = -0.94$, $p < 0.001$; CC: $\beta = -0.88$, $p < 0.05$; NJAP: $\beta = -2.47$, $p < 0.001$; LFA: $\beta = -3.72$, $p < 0.001$; but not EAP: $p > 0.05$). The IM-P total score and the factors significantly predicted intrinsic religious orientation (total score: $\beta = 0.12$, $p < 0.01$; CC: $\beta = 0.26$, $p < 0.01$; EAP: $\beta = 0.40$, $p < 0.001$; but not NJAP nor LFA: $p > 0.05$), and some IMP factors were significantly predictive of positive religious coping (CC: $\beta = 0.35$, $p < 0.01$; EAP: $\beta = 0.38$, $p < .005$; but not total score, NJAP nor LFA: $p > 0.05$).

Furthermore, we conducted multiple indicators multiple causes (MIMIC) modeling to see stability and effects of covariates on stability. MIMIC includes both a measurement model (as our established CFA model) and a structural model with theoretically relevant covariates. The covariates in our MIMIC model include parent gender, age, and marital status. The MIMIC model obtained a good fit, $X^2 = 541.37$, $df = 281$, $p < 0.001$, GFI = 0.91, CFI = 0.91, RMSEA = 0.05, showed in Fig. 1. Results showed

Table 5 Correlations between factors of Chinese versions of IMP and other variables ($n = 837$)

	IMP total	CC	NJAP	EAP	LFA
IMP total score[T]	–				
CC[T]	0.76***	–			
NJAP[T]	0.65***	0.12**	–		
EAP[T]	0.70***	62***	0.13***	–	
LFA[T]	0.63***	0.25***	0.56***	0.11**	–
MAAS mindfulness[b]	0.59***	0.37***	0.59***	0.26***	0.55***
APGAR family functioning[C]	0.40**	0.17	0.37**	0.39**	0.28*
SHS happiness[C]	0.51***	0.27*	0.53***	0.40**	0.28*
GHQ-12 psychiatric well-being[B]	0.54***	0.27***	0.57***	0.28***	0.40***
SF-12 mental health[C]	0.53***	0.30*	0.57***	0.34**	0.42**
SF-12 physical health[C]	− 0.03	− 0.14	.07	0.00	− 0.03
ROS-R intrinsic religious orientation[A]	0.22**	0.20**	0.09	0.27**	0.07
PRCOPE positive religious coping[A]	0.12	0.18*	− 0.01	0.18*	− 0.06
PSI total score[A]	− 0.52***	− 0.25***	− 0.50***	− 0.26***	− 0.35***
PSI parental distress[A]	− 0.47***	− 0.17**	− 0.50***	− 0.24***	− 0.35***
PSI parent-child dysfunctional interaction[A]	− 0.50***	− 0.33***	− 0.48***	− 0.23***	− 0.34***
PSI difficult child[A]	− 0.37***	− 0.18***	− 0.36***	− 0.20***	− 0.24***
ECBI problem score[A]	− 0.29***	−.14*	− 0.29***	− 0.14*	− 0.26***
ECBI intensity score[A]	− 0.35***	− 0.15*	− 0.37***	− 0.13*	− 0.33***

CC compassion for child, *NJAP* nonjudgmental acceptance in parenting, *EAP* emotional awareness in parenting, *LFA* listening with full attention

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

[T] Full dataset ($n = 837$)

[A] Dataset of parents with preschool children ($n = 394$)

[B] Dataset of parents with primary school children ($n = 242$)

[C] Dataset of parents with secondary school children ($n = 201$)

that older parental age was significantly related to higher CC ($\beta = 0.11$, $p < 0.02$), NJAP ($\beta = 0.11$, $p < 0.05$) and EAP ($\beta = 0.14$, $p < 0.01$), and the parental gender and marital status were not significantly related to the IM-P factors.

Reliability of the 23 Item Chinese Version of the IM-P

Table 7 includes the mean scores of the Chinese version of the IM-P items, and their total scores. Overall, internal consistency based on 23 items was 0.85 and those of four subscales are 0.70 to 0.84. Item level tests were conducted to assess the scale mean and variance if an item was deleted, corrected item-total correlations and Cronbach's alpha if item deleted. These results suggest that all items performed well, with no significant improvements in reliability associated with deleting any single individual item.

Discussion

We examined the psychometric properties of the Hong Kong Chinese version of the IM-P scale. Internal consistency, the factor structure of the measure, convergent validity, and the suitability as an outcome measure were reported. It was found that the IM-P had acceptable internal consistency. When the factor structure was explored, four factors emerged, which differed somewhat from the originally hypothesized dimensions of the IM-P from the USA (Duncan 2007) and the results from two validation studies (de Bruin et al. 2014a, b; Moreira and Canavarro 2017). This may reflect that parenting behavior and meaning are embedded in culture, like many topics in cross cultural studies (Bornstein 2012). Researchers interested in studying mindfulness in the context of parenting and families should adopt Western concepts and measures with necessary cultural adaptations. In this study, we found initial support for the validity of the IM-P in studying Chinese parents. More studies should be conducted to understand the possible application of mindfulness in the context of parenting and families in Chinese culture. As family practitioners and researchers have started to develop interest in applying mindfulness-based interventions for Chinese families, the Chinese version of the IM-P may also be used in evaluating program effects.

It was interesting to note that emotional awareness of self and emotional awareness of child did not emerge as distinctive factors in the Chinese versions of the IM-P scale. This may reflect a unique emotional coping style specific to Chinese parents in comparison to other cultural groups. In general, it has been consistently found that rumination and suppression are commonly used to cope with emotional ambivalence among Chinese (Chen et al. 2005). Emotional expression is determined more by authority and role relationships than individual feelings (Ho et al. 2004), and it is commonly acceptable for Chinese parents to teach their children emotional management with suppression, especially in front of people with higher authority and in social contexts.

Table 6 Regression of Chinese versions of IMP controlling demographics of children and parents ($n = 837$)

	IMP total score β	IMP CC β	IMP NJAP β	IMP EAP β	IMP LFA β	R^2
PSI	− 1.08***	–	–	–	–	0.29***
Total score[A]	–	− 1.28***	–	–	–	0.09***
	–	–	− 2.38***	–	–	0.26***
	–	–	–	− 1.66***	–	0.11***
	–	–	–	–	− 2.82***	0.14***
PSI	− 0.41***	–	–	–	–	0.23***
Parental distress[A]	–	2.45***	–	–	–	0.25***
	–	–	2.23***	–	–	0.06***
	–	–	–	− 1.92**	–	0.04**
	–	–	–	–	− 1.11*	0.03
PSI	− 0.35***	–	–	–	–	0.29***
Parent-child dysfunctional interaction[A]	–	1.31**	–	–	–	0.06***
	–	–	0.88*	–	–	0.05**
	–	–	–	− 0.60	–	0.05
	–	–	–	–	− 1.93***	0.11***
PSI	− 0.32***	–	–	–	–	0.15***
Difficult child[A]	–	1.64**	–	–	–	0.04*
	–	–	1.89***	–	–	0.05**
	–	–	–	− 1.31*	–	0.03
	–	–	–	–	− 1.21*	0.03*
APGAR	0.10**	–	–	–	–	0.25*
Family functioning[C]	–	0.11	–	–	–	0.13
	–	–	0.25**	–	–	0.23*
	–	–	–	0.26**	–	0.24*
	–	–	–	–	0.32	0.17
ECBI	− 0.27***	–	–	–	–	0.09***
Problem score[A]	–	−0 .31*	–	–	–	0.02
	–	–	− 0.64***	–	–	0.09***
	–	–	–	− 0.38*	–	0.02
	–	–	–	–	− 0.98***	0.07**
ECBI	− 0.94***	–	–	–	–	0.13***
Intensity score[A]	–	− 0.88*	–	–	–	0.04
	–	–	− 2.47***	–	–	0.15***
	–	–	–	− 0.89	–	0.03
	–	–	–	–	− 3.72***	0.13***
ROS-R	0.12**	–	–	–	–	0.10**
Intrinsic religious orientation[A]	–	0.26**	–	–	–	0.10**
	–	–	0.12	–	–	0.05
	–	–	–	0.40***	–	0.12***
	–	–	–	–	0.17	0.06*
PRCOPE	0.10	–	–	–	–	0.07*
Positive religious coping[A]	–	0.35**	–	–	–	0.09**
	–	–	0.00	–	–	0.04
	–	–	–	0.38*	–	0.07*
	–	–	–	–	− 0.16	0.05

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

[T] Full dataset ($n = 837$)

[A] Dataset of parents with preschool children ($n = 394$)

[C] Dataset of parents with secondary school children ($n = 201$)

CC compassion for child, *NJAP* nonjudgmental acceptance in parenting, *EAP* emotional awareness in parenting, *LFA* listening with full attention

As such, the concept of mindfulness may have special relevance in the struggles of Chinese parents, who faces dilemmas between concerns about children's fulfillment of duties, obligations, and rules endorsed by traditional Chinese culture on one hand, and the development of independent and self-determined characters (Sun 2013). Strict parental control is common among Chinese families, and provision of personal space for children has not been placed in the priority in Chinese parenting (Shek and Sun 2014). It is likely that Chinese parents may experience a unique experience of stress arising from raising their children, and mindfulness may be useful both in regulating their difficulties, and provide benefit for supporting their children with more flexibility in response to daily challenges.

In last few decades, mindfulness-based intervention has developed its relative strong evidence-base in health care and mental health issues, such as cancer and other chronic medical conditions, depression (Kabat-Zinn 2013; Segal et al. 2013). More recently, scholars have begun applying mindfulness-based intervention with the aim of reducing the stress of

Table 7 Summarized average scores of the Chinese version of IMP-23 items ($n = 837$)

Items	Mean (SD)	Range	Corrected item-total correlation	Cronbach's alpha if item deleted
Compassion for child				
Item 22	3.53 (0.91)	1–5	0.54	0.83
Item 24	3.76 (0.82)	1–5	0.55	0.83
Item 25	3.55 (0.87)	1–5	0.62	0.82
Item 27	3.94 (0.82)	1–5	0.69	0.81
Item 28	3.63 (0.83)	1–5	0.60	0.82
Item 30	3.36 (0.81)	1–5	0.51	0.84
Item 31	3.80 (0.83)	1–5	0.70	0.81
Cronbach's alpha = 0.84				
Nonjudgmental acceptance in parenting				
Item 11	3.13 (0.94)	1–5	0.49	0.76
Item 14	3.09 (0.99)	1–5	0.55	0.74
Item 17	3.14 (0.95)	1–5	0.50	0.76
Item 23	3.00 (1.04)	1–5	0.59	0.73
Item 26	3.05 (1.06)	1–5	0.50	0.76
Item 29	2.83 (0.91)	1–5	0.54	0.75
Cronbach's alpha = 0.78				
Emotional awareness in parenting				
Item 2	3.08 (0.82)	1–5	0.42	0.76
Item 8	3.17 (0.94)	1–5	0.50	0.75
Item 16	3.25 (0.83)	1–5	0.58	0.72
Item 18	3.47 (0.83)	1–5	0.50	0.74
Item 20	3.35 (0.87)	1–5	0.55	0.73
Item 21	3.12 (0.84)	1–5	0.56	0.73
Cronbach's alpha = 0.77				
Listening with full attention				
Item 1	3.15 (0.80)	1–5	0.48	0.63
Item 9	3.38 (0.83)	1–5	0.39	0.68
Item 13	3.51 (0.94)	1–5	0.52	0.60
Item 19	3.40 (0.87)	1–5	0.53	0.60
Cronbach's alpha = 0.70				

Chinese parents and caregivers (Hou et al. 2014; Lo et al. 2018, 2017a). It signified that one future direction for mindfulness research is to expand its relevance from an individual level to an interpersonal level and thus a model of mindful relating has been proposed to address the needs of family life (Gehart 2012). From a mindfulness perspective, parenting is grounded on a model of mindful relating processes that would be a balance between relational processes and personal processes. While relational processes involves being emotionally present and available to the other, experiencing and expressing compassion for, and acceptance of the other, personal processes includes self-regulation of one's own emotions, and practicing self-acceptance for the self.

Limitations

This study has several limitations. First, the research findings are based on convenience samples of parents in Hong Kong who do not represent the overall Chinese population. Future studies should test the IM-P in mainland China, Taiwan, and other Chinese communities in the diaspora so as to verify if this scale is suitable for other Chinese communities outside of Hong Kong. Second, all data were collected using self-reported measures and thus social desirability/self-presentation bias may become a concern. Further studies should link the Chinese version of the IM-P with other observational methods, such as was done with the English-language version of the IM-P in the USA (Duncan et al. 2015), or combine or compare rating from multiple family members, for example, the ratings of children and spouse for cross validation.

In conclusion, the present study offers the translation and initial validation of the Hong Kong Chinese version of the IM-P for the assessment of mindful parenting. The scale has good psychometric properties and has been demonstrated to be a valid measure. It was found to have moderate positive correlations with parent dispositional mindfulness, happiness, mental health, moderate negative correlations with parental depression and stress, and child behavioral problem, and no correlations with physical health and positive religious coping. The scale is recommended for use in studies of mindful parenting, and may be used as an outcome measure in studies of mindful parenting intervention programs for Chinese populations.

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Author Contributions LHHM: designed and executive the study, and wrote the paper. YJWK: assisted in designing the study, analyzed the data, and wrote the section of results of the paper. DLG: offered advice on the translation, endorsed the final version of the translation, and assisted in editing of the paper. MA: collaborated in the data collection for sample 2. SAFY: collaborated in the data collection for sample 2. CSKC: assisted in scale translation and collaborated in the data collection for sample 1. CCW: assisted in data analyses. SMP: collaborated in the data collection for sample 1. CKKW: offered advice and assisted in data analyses. NSM: offered advice on study design and proofread the paper.

Compliance with Ethical Standards This study was approved by the City University of Hong Kong Research Office Ethics Committee.

Informed Consent Written consent was obtained from all individual participants.

Conflict of Interest The authors declare that they have no conflicts of interest.

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