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Astrid Lebert-Charron , Géraldine Dorard , Jaqueline Wendland ,
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- The continuum between the clusters shows the coherence of the parental burnout construct.
- Depression and anxiety are significantly associated with parental burnout.
- Postpartum moms with postnatal depression are more likely to develop parental burnout.

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Who are and are not the burnout moms? A cluster analysis study of French-speaking mothers

Astrid Lebert-Charron¹, Géraldine Dorard¹, Jaqueline Wendland¹, Emilie Boujut^{1,2}

¹ Université de Paris, LPPS, 71 avenue Edouard Vaillant, F-92100 Boulogne-Billancourt, France

² High School of Teaching and Education, University of Cergy-Pontoise, Paris Seine University, Cergy, France

* Corresponding Author: astrid.lebert@yahoo.com

Abstract:

Background: Chronic stress in parenthood can lead to difficulties for parents, including parental burnout. Parental burnout is defined by four dimensions: emotional exhaustion, emotional distancing, feeling fed-up, and contrast in parental self. The aim of this cross-sectional study is to identify the profiles of at-risk mothers for parental burnout.

Methods: One thousand three hundred and six French-speaking mothers, aged over 18 years with at least one child living regularly at home, completed an online set of questionnaires. The mothers responded to the Parental Burnout Assessment (PBA), the Hospital and Anxiety Depression Scale (HADS), the Edinburgh Postnatal Depression Scale (EPDS), the Brief Burden Interview (BBI), the Triangular Love Scale (TLS), and a sociodemographic questionnaire.

Results: Cluster analysis revealed five profiles based on the score levels on the four dimensions of parental burnout. Analysis of variance (ANOVA) showed that the five clusters significantly differed on the affective variables (i.e., depression, anxiety,

postnatal depression, burden), love in couple relationship, and sociodemographic variables. The results highlighted that all the variables are associated with two extreme groups (Absence of Parental Burnout and Very High Manifestations of Parental Burnout).

Limitations: The cross-sectional design did not allow the identification of the directional nature of the association between the independent variables and the five clusters.

Conclusions: The mothers' five profiles based on the level of parental burnout manifestations enabled the identification of mothers with greater difficulties, contributing to the design of specific primary prevention and therapeutic interventions for parental burnout.

Key words: Parental burnout; love; anxiety; depression; burden

Highlights:

The continuum between the clusters shows the coherence of the parental burnout construct.

Depression and anxiety are significantly associated with parental burnout.

Postpartum moms with postnatal depression are more likely to develop parental burnout.

Introduction

While parenting is generally viewed as a positive experience (Hansen, 2012), it can also constitute a risk for mothers' mental health. Recent literature has identified parental burnout as one of the risks associated with parenthood (Lebert-Charron, Wendland, Dorard, & Boujut, 2018; Mikolajczak, Raes, Avalosse, & Roskam, 2018; Roskam, Raes, & Mikolajczak, 2017).

Parental burnout is defined as *"a state of intense exhaustion related to one's parental role, in which one becomes emotionally detached from one's children and doubtful of one's capacity to be a good parent"* (Roskam et al., 2017). Parental burnout encompasses four dimensions: emotional exhaustion, emotional distancing, saturation, and contrast. Exhaustion is the manifestation of burnout that most often appears first. The parent feels drained, exhausted, and without energy. Emotional distancing is characterized by disinvestment and distancing from one's children, manifested by a decrease in the parent's attention on the children, decreased parental involvement, and difficulties in showing affection. Saturation is characterized by the parents' inability to fulfill their parenting role; the parents lose the pleasure they previously had in parenting. Finally, contrast is defined by the parents' awareness of the difference between the parents they were and the parents they have become (Roskam, Brianda, & Mikolajczak, 2018).

According to studies recently conducted in several countries, the prevalence of parental burnout ranges from 2.1% for Dutch mothers (Van Bakel, Van Engen, & Peters, 2018) to 21% for Japanese ones (Kawamoto, Furutani, & Alimardani, 2018); the estimate is 6.6% for French-speaking mothers (Sánchez-Rodríguez, Callahan, & Séjourné, 2019). Beyond cultural differences, this large heterogeneity is probably related to the absence of clearly established thresholds.

Considering affective variables, in the early stages of research on parental burnout, a consistent body of studies has shown that mothers of children with special needs are more vulnerable to parental burnout than mothers of typical children (Demirhan et al., 2011; Duygun & Sezgin, 2003; Gérard & Zech, 2018; Lindahl Norberg, 2010; Lindström, Åman, & Norberg, 2010). In some of these studies, the authors suggested a link between burden and parental burnout, but without an accurate evaluation of burden. Burden is defined by all the physical, material, psychological, and

emotional constraints felt by the caregiver of a sick or disabled person (Zarit, Todd, & Zarit, 1986). Thus, “burden” shares much meaning with “burnout” (Gérain & Zech, 2019), but to our knowledge, no study has evaluated both burden and parental burnout in the same sample. Moreover, some major affective risk factors for parental burnout have been demonstrated, in particular anxiety (Lebert-Charron, Dorard, Boujut, & Wendland, 2018; Séjourné, Sanchez-Rodriguez, Leboullenger, & Callahan, 2018; Weiss, 2002), depression (Lebert-Charron, Dorard, et al., 2018; Sánchez-Rodríguez, Callahan, & Séjourné, 2018; Séjourné et al., 2018), and history of postnatal depression (depression appearing in mothers during the child’s first year) (Dayan & Baleyte, 2008; Gressier & Sutter-Dallay, 2018; Séjourné et al., 2018). However, despite the links between the emotional dimensions commonly found in the parenting domain and parental burnout, Mikolajczak, Gross, Stinglhamber, and Norberg (2019) highlighted that parental burnout is different from depression.

Regarding the conjugal couple, satisfaction with the couple relationship is a strong protective factor against parental burnout (Lindström et al., 2011; Mikolajczak et al., 2018; Riva et al., 2014; Weiss, 2002). The concept of satisfaction with the relationship and the nature of love is one way of assessing the quality of the couple relationship (Sternberg, 1997; Sternberg & Grajek, 1984). While it has been shown that marital satisfaction has effects on parental burnout, love in the relationship has never been studied in relation to parental burnout. Sternberg conceptualizes love in three dimensions: passion, commitment, and intimacy (1997).

Many sociodemographic risk factors for parental burnout have been identified, such as: being unemployed (Mikolajczak, Raes, et al., 2018; Sorkkila & Aunola, 2020), having a high large of children, (Kawamoto et al., 2018; Le Vigouroux & Scola, 2018), and having a child under 5 years old (Le Vigouroux & Scola, 2018; Mikolajczak, Raes, et al., 2018). In contrast, full-time employment appears to be a protective factor (Lebert-Charron, Dorard, et al., 2018; Mikolajczak, Raes, et al., 2018).

At this point of knowledge, it is important that the literature on parental burnout continues to grow. Profiling mothers based on the level of manifestations of parental burnout could allow clinicians to identify mothers in greater difficulty, promote specific primary prevention, and advise on targeted therapeutic interventions for parental burnout (Lebert-Charron, Dorard, et al., 2018). The sociodemographic factors identified can help professionals (i.e., doctors, social professionals, psychologists) to identify

mothers who may be at risk of parental burnout and suggest specific interventions for the affective and love factors. In addition, the Balance between Risks and Resources framework of Mikolajczak and Roskam (2018) shows that parental burnout results more from an accumulation of risk factors than from specific factors. While more than 30 studies have demonstrated the existence of links between various risk or protective factors and parental burnout, to date, only two have used cluster analysis (Riva et al., 2014; Sánchez-Rodríguez, Orsini, Laflaquière, Callahan, & Séjourné, 2019). In the first study, Riva et al., (2014) clustered post-traumatic disorders variables and compared clusters [(i) low distress and low post-traumatic growth, ii) high post-traumatic growth, iii) low distress and some post-traumatic growth, and iv) high distress)] on background variables (i.e., perceived support, age of the parents). This study focused only on parents whom children have undergone hematopoietic stem cell transplantation. In the second study, Sánchez-Rodríguez, et al., (2019) clustered depression, anxiety, and guilt symptoms, identifying three clusters: i) guilt feelings, ii) severe distress, and iii) average distress. This study aimed to identify subtypes of parental burnout in mothers with high maternal burnout scores. These studies yielded interesting results, but did not focus on the dimensions of parental burnout in the overall population of mothers. In addition, as no cut-off scores have been published for the Parental Burnout Assessment (PBA) (Roskam, et al., 2018), cluster analysis seems to be a relevant methodology for further investigations of parental burnout.

Thus, the present study is the first to investigate the profiles of at-risk mothers based on their scores for the four dimensions of parental burnout, which potentially reflect clinical heterogeneity and not the total level of parental burnout. Next, the first objective is to identify the typology of burned-out mothers based on the dimensions of parental burnout. The second objective is to evaluate how these profiles differ in terms of affective variables (i.e., anxiety, depression, burden, postnatal depression), love dimensions (intimacy, commitment, passion), and sociodemographic factors.

Methods

Participants and Procedure

Participants were 1306 French-speaking mothers recruited from the general population, aged more than 18 years old, and having a child living regularly at home. In

the total sample, 228 mothers had a child with special needs, 275 had a child aged under one year and 1144 were in couple.

An announcement on the survey was posted on various social networks (i.e., Facebook groups on parenting or self-help groups in different French cities) and sent by the investigators to their private social network, asking participants to disseminate it to their friends to create a snowball sampling procedure. Mothers interested in participating were invited to complete an online set of questionnaires on LimeSurvey after giving their informed consent. At the end of the survey, the participants were invited to seek psychological support from their local public mental health services if they felt any discomfort in answering the survey. Data collection took place between April 2018 and May 2019.

The study protocol was approved by the local ethics committee of Paris Descartes University (IRB: 2018-28). The inclusion criteria were: 1) being a French-speaking mother, 2) being aged over 18 years, and 3) having at least one child living regularly at home. One participant was excluded because she was under 18 years old, and two others were excluded because they did not have children living regularly at home.

Measures

Questionnaires were completed by the participants, with a forced choice that prevented missing data.

Parental burnout

Parental burnout was assessed with the PBA developed and validated in French by Roskam, Brianda, and Mikolajczak (2018). The PBA comprises 23 items divided into four subscales: emotional exhaustion (e.g., "I feel completely run down by my role as a parent"), contrast (e.g., "I don't think I'm the good father/mother that I used to be to my child(ren)"), saturation (e.g., "I don't stand my role as father/mother any more"), and emotional distancing (e.g., "I do what I'm supposed to do for my child(ren), but nothing more"). Items were rated on a 7-point Likert-scale from 0 (never) to 6 (every day). In the present sample, Cronbach's alphas were: .98 for the general consistency, .93 for emotional exhaustion, .90 for contrast, .90 for saturation, and .79 for emotional distancing. A total score was also calculated.

Symptoms of anxiety and depression

Symptoms of anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983)–French version (Lépine, Godchau, Brun, & Lempériere, 1985). This scale is composed of 14 items divided into two subscales: anxious symptoms (e.g., “I feel tense or ‘wound up’”) and depressive symptoms (e.g., “I feel as if I am slowed down”). Each item was rated on a 4-point Likert scale ranging from 3 (most of the time) to 0 (not at all) or from 3 (nearly all the time) to 0 (not at all). Cronbach’s alphas were: .77 for the anxiety score and .81 for the depression score.

Burden

Burden was assessed with the French version of the Brief Burden Inventory (BBI) validated by Hébert, Bravo, and Prévaille (2000). Burden is the exhaustion felt by the caregiver of a person with special needs. This scale is composed of 12 items (e.g., “Do you feel angry when you are around (care recipient)?” The participants answers were on a 5-point Likert scale from 0 (never) to 4 (almost always). Here, Cronbach’s alpha was .92. Only mothers with a child with special needs (i.e., disease or disability) answered this scale (n = 228).

Postnatal depression

Postnatal depression was assessed using the Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky, 1987)–French version, validated by Guédeney and Fermanian (1998). This 10-item scale measures the intensity of feelings of postnatal depression (i.e., “I could laugh and take things on the bright side”). Responses ranged 0–3. The internal consistency was .76 in the present study. Only the mothers with a child aged under 1 year answered this scale (n = 275).

Love in relationship

Love in relationship was evaluated using the Triangular Love Scale (TLS) (Sternberg, 1997). We used a French translation that has not been validated (Gana et Boujut). This 36-item scale evaluates three components of love in a relationship: intimacy (e.g., “I have a warm and comfortable relationship with”), passion (e.g., “I cannot imagine life without”), and commitment (e.g., “I will always feel a strong

responsibility for"). Intimacy is related to the experience of warmth in a loving relationship; passion is defined by the romance, the physical attraction and related behavior in a loving relationship; commitment refers to a person's decision to love the other. The participants answered on a 9-point Likert scale, where the score for each item ranged from 1 (not at all) to 9 (extremely). Cronbach's alphas were: .97 for intimacy, .95 for passion, and .93 for commitment. Only mothers who declared they were living in couple answered this scale (n = 1144).

Sociodemographic variables

Participants were asked about their marital status (living in couple, divorced, separated, or single), age, the number of children living regularly at home, the children's characteristics (age, health status as declared by the mothers), housing satisfaction (from 1 to 7), household income level, occupational status, and if appropriate, level of job satisfaction (from 1 to 10).

Statistical analyses

The analyses were conducted using SPSS 24. Firstly, we performed Pearson correlations to identify the association between all the studied variables (*cf Table 1*). We screened for outliers (boxplots in supplementary material). Cluster analysis, on the total sample, was used to identify homogeneous groups of mothers based on their scores on the four dimensions of parental burnout: emotional exhaustion, emotional distancing, saturation, and contrast. Then, these scores were converted into z-scores. The number of clusters was not determined in advance. To identify clusters, we first performed hierarchical cluster analysis using the Ward method with squared Euclidian distance measures to determine the number of clusters (Yim & Ramdeen, 2015). After analyzing the dendrogram and the agglomeration schedule, a model of five clusters of mothers was identified. In the second step, we conducted K-means clustering analyses by specifying the most adapted number of clusters resulting from the first step (i.e., five clusters) and assigned individuals into one of the identified clusters. The clusters solution was replicated across two random subsets of 457 participants (35% of the sample) and 653 participants (50% of the sample), allowing its reliability to be examined and confirmed. We performed analysis of variance (ANOVA) with Bonferroni post-hoc tests ($p < .05$) to

identify the differences between the five clusters on affective variables (i.e., anxiety, depression, burden, postnatal depression), love dimensions in relationship (intimacy, commitment, passion), and sociodemographic variables (i.e., age of the mother, work satisfaction, accommodation satisfaction, number of children, number of children under 5 years old). We also performed Welch's ANOVA for two variables because of their distribution (i.e. number of children and number of children under 5 years old) and the results are strictly the same as with ANOVA (results upon request). Finally, several chi-square tests were calculated in order to compare the distribution of several relevant characteristics among the clusters (i.e., postpartum mothers; postnatal depressed mothers; mothers having a child with special needs; burdened mothers).

Results

Participant characteristics

A sample of 1306 mothers meeting the inclusion criteria participated in the study. Their mean age was 36.02 years (standard deviation [SD] = 6.80, range = 20–60), and the mean number of children living at home was 2.03 (SD = .94, range = 1–9). Regarding socioeconomic status, the monthly household income was as follows: 11.94%, lower than 1500€ (n = 156); 10.26%, between 1500€ and 2100€ (n = 134); 14.32%, between 2100€ and 2800€ (n = 187); 27.79%, between 2800€ and 4200€ (n = 363); 20.21%, between 4200€ and 6000€ (n = 264); 11.79%, over 6000€ (n = 154); 3.68% could not or did not wish to answer the question (n = 48). These data indicate that the sample has a higher SES level than the general French population ([NISES], 2019). Regarding work status, most mothers (63.20%) were employed (n = 825), 18.91% were unemployed (n = 247), and 17.92% were housewives (n = 234). These data are representative of the French population ([NISES], 2019). Regarding educational level, 2.14% mothers had no diploma (n = 28), 8.50% had a certificate of vocational proficiency (n = 111), 15.24% had a French high school diploma (n = 199), 15.01% had a 2 years university degree (n = 196), 25.50% had a 3 years university degree (n = 333), 30.476% had a 5 years university degree (n = 398) and 3.14% had a PhD (n = 41). These data indicate that the sample is significantly more educated than the general French population ([NISES], 2019). Two hundred and twenty-eight mothers declared that they had a child with special needs (17.46%). Four hundred and seven children had special

needs [8.60% had psychiatric disorders ($n = 35$), 17.69% had a severe somatic disease ($n = 72$), 23.34% had neurodevelopmental disorders ($n = 95$), and 50.37% had a chronic disabling condition ($n = 205$)]. 275 had a child under 1 year old (21.06%), and 787 mothers were employed (60.26%) (see Supplementary Material for complete descriptive statistics).

Bivariate correlations

Correlations between the PBA dimensions (i.e. emotional exhaustion, emotional distancing, saturation and contrast) and all the variables studied (i.e. anxiety, depression, postnatal depression, burden, intimacy, passion and commitment) were almost all significant with varying effect sizes (from $r = 0.13$ to $r = 0.96$).

[Insert Table 1 about here]

Group identification

The significance of the differences for the four dimensions of the PBA between the five identified clusters was evaluated with ANOVA. The ANOVAs revealed significant differences between the five clusters for emotional exhaustion [$F(4;1305) = 1695.56$, $p < .001$], saturation [$F(4;1305) = 1730.01$, $p < .001$], contrast [$F(4;1305) = 1377.74$, $p < .001$], and emotional distancing [$F(4;1305) = 1317.24$, $p < .001$]. The five clusters identified are presented in the order of increasing severity of manifestations of parental burnout (Figure 1).

[Insert Figure 1 about here]

The first cluster identified (49.31%, $N = 644$), termed “Absence of Parental Burnout” (APB), was characterized by very low scores for emotional exhaustion, emotional distancing, saturation, and contrast dimensions. The second cluster (17.92%, $N = 234$), termed “Middle Manifestations of Parental Burnout” (MMPB), was characterized by low levels of emotional exhaustion and saturation and very low levels of emotional distancing and contrast. The third cluster (10.87%, $N = 142$), termed “Moderate Emotional Distancing” (MED), was characterized by very low levels of emotional exhaustion and saturation, low level of contrast, and moderate level of

emotional distancing. The fourth cluster (12.40%, N = 162), termed “High Manifestations of Parental Burnout” (HMPB), was characterized by moderate scores for emotional exhaustion, saturation, contrast, and emotional distancing dimensions. Finally, the fifth cluster (9.49%, N = 124), termed “Very High Manifestations of Parental Burnout” (VHMPB), was characterized by high levels of the four dimensions of the PBA questionnaire.

Differences between the five clusters on affective variables, love dimensions, and sociodemographic variables

ANOVA revealed significant differences for all the variables between the five groups: anxiety [F(4;1305) = 92.04, $p < .001$, $\eta^2 = 0.22$], depression [F(4;1305) = 199.20, $p < .001$, $\eta^2 = 0.38$], burden [F(4;227) = 23.15, $p < .001$, $\eta^2 = 0.29$], postnatal depression [F(4;274) = 32.66, $p < .001$, $\eta^2 = 0.33$], intimacy [F(4;1143) = 27.56, $p < .001$, $\eta^2 = 0.09$], commitment [F(4;1143) = 8.122, $p < .001$, $\eta^2 = 0.03$], passion [F(4;1143) = 15.88, $p < .001$, $\eta^2 = 0.05$], age of the mother [F(4;1301) = 3.96, $p < .001$, $\eta^2 = 0.01$], work satisfaction [F(4;786) = 13.53, $p < .001$, $\eta^2 = 0.07$], housing satisfaction [F(4;1305) = 13.06, $p < .001$, $\eta^2 = 0.04$], number of children at home [F(4;1305) = 7.40, $p < .001$, $\eta^2 = 0.02$], and number of children under 5 years old [F(4;1305) = 9.275, $p < .001$, $\eta^2 = 0.03$] (for specific differences between clusters, see Table 2).

[Insert Table 2 about here]

Group comparison.

Some additional comparisons between cluster on relevant variables were performed using chi-square tests (Table 3).

The analyses revealed that mothers having a child with special needs were more likely to be in the APB cluster (37.28% - $\chi^2 = 257.38$, $df = 176$, $p < .001$), while mothers with a severe burden were more likely to be in the HMPB (29.66%) and VHMPB (23.73%) clusters ($\chi^2 = 52.18$, $df = 4$, $p < .001$).

The results also showed that postpartum mothers were more numerous in the APB cluster (52%) and very few in the VHMPB (7.27% - $\chi^2 = 221.33$, $df = 116$, $p < .001$). The proportion of mothers with postnatal depression was highest in APB cluster (26.17%), but relatively high in the VHMPB cluster (18.69% - $\chi^2 = 68.81$, $df = 4$, $p < .001$).

[Insert Table 3 about here]

Discussion

This study aimed at: (i) identifying the profile of burned-out mothers based on the four dimensions of parental burnout; and (ii) evaluating whether these profiles differ in terms of affective variables (i.e., anxiety, depression, postnatal depression, burden), love in couple relationship (i.e., intimacy, commitment, passion), and sociodemographic factors. From the scores obtained on the four dimensions of the PBA, the cluster analysis revealed the presence of five groups of mothers according to their parental burnout status: APB, MMPB, MED, HMPB, and VHMPB. It appears that these five clusters differ significantly according to affective dimensions (i.e., anxiety, depression, burden, postnatal depression), love in couple relationship, and sociodemographic variables. Effect size analyses indicate that associations between affective variables and parental burnout are the most important, followed by love in the relationship. Conversely, the contextual variables are very weakly associated with parental burnout.

The results showed an increase in the burnout parental scores between APB and VHMPB, along with an increase in affective scores and a decrease in scores related to love in couple. The differences between the five clusters reflect a continuum of intensity, with the most marked and systematic differences between APB and VHMPB. All the variables studied (i.e., affective, linked to a conjugal relationship, and sociodemographic) were associated with the two extreme groups (APB and VHMPB). Thus, the more the mothers had manifestations of parental burnout, the higher these factors were (i.e., anxiety, depression, postnatal depression, burden, low levels of intimacy, commitment and passion, low work and housing satisfaction, young age of mothers, high number of children, and especially high number of young children). The reverse is also true: the less the mothers had manifestations of parental burnout, the more protective factors the mothers had (i.e., low levels of anxiety, depression, postnatal depression, burden, high levels of intimacy, commitment and passion, high work and housing satisfaction, high age of mothers, low number of children, and especially high number of young children).

The intensity continuum between the different clusters and the bivariate correlations highlight the coherence of the four-dimensional parental burnout construct. Symptoms evolve together progressively from the APB cluster to the VHMPB cluster, indicating a continuity in the concept of parental burnout. In addition, in this continuity, we note the particularity of the cluster MED, which emerges exclusively on the basis of emotional distancing. This result suggests that mothers in the MED cluster are more vulnerable to parental burnout through emotional distancing than the mothers in the APB and MMPB clusters. This dimension must therefore be specifically taken into account when studying parental burnout. Indeed, Mikolajczak, et al. (2018) indicate that emotional distancing is particularly associated with the consequences of parental burnout in children (abuse and neglect). A high score on this dimension is therefore to be taken into account specifically, while the other dimensions are not necessarily high because the risk is high for the children.

The particularity of the cluster MED was totally unexpected. However, we may hypothesize that emotional distancing could be related to the operational way of thinking of mothers with postpartum depression with their child (Rochette-Guglielmi & Mellier, 2007). This operational way of thinking then refers to alexithymia and questions the emotional capacities of these mothers (Pirlot, 2014). This potential link between alexithymia and mothers with high levels of emotional distancing implies that it would be interesting to investigate possible post-traumatic stress disorder experiences among mothers in the MED cluster. Because this cluster was unexpected, this point deserves further research.

Regarding the results related to affective variables (i.e., depression, anxiety, burden, postnatal depression), our study corroborates the results of previous studies showing that depression and anxiety are significantly and positively associated with parental burnout (Kawamoto et al., 2018; Lebert-Charron, Dorard, et al., 2018; Mikolajczak et al., 2019; Roskam et al., 2017; Séjourné et al., 2018; Weiss, 2002). However, our results add an additional element by showing that low levels of affective variables are characteristics of APB. Moreover, according to the HADS cut-off, our sample is composed of rather anxious mothers. Indeed, the HADS-A averages in all clusters indicate moderate to high levels of anxiety.

In the field of parental burnout, postnatal depression has not been extensively studied. Only one study has identified a history of postnatal depression as a predictor of

parental burnout (Séjourné et al., 2018). However, the present study presents another insight into these connections by showing that postpartum mothers with high levels of postnatal depression are more likely to develop parental burnout. The results appear logical because postpartum refers to a specific period of the mother's life that increases the risk of mental health problems (Bydlowski, 2004). Postnatal depression can therefore be considered a good indicator of potential manifestations of parental burnout. Moreover, regarding the EPDS cut-off score (i.e., >10.5, Guedeney & Fermanian, 1998), the mean EPDS scores for the four clusters MMPB, MED, HMPB, and VHMPB were higher than the cut-off score. The comparison of mothers in the postpartum period and in postpartum depression between the clusters showed not only that postpartum depression increases the risk of parental burnout, but also that there is no overlap between these two concepts. Indeed, many mothers are depressed in the postpartum period without being in parental burnout (see Table 2, APB cluster, 26.17%). However, mothers with very severe parental burnout (i.e. VHMPB) and who are postpartum are all postnatally depressed. Sánchez-Rodríguez, et al. (2019) showed that in their severe distress cluster there were more mothers with a history of postnatal depression. Those results taken together indicate that postpartum depression and parental burnout are different notions, but they can overlap when the symptomatology of parental burnout is very important.

As parental burnout was, in the first studies, mainly evaluated among samples of parents of children with special needs (Karadavut & Uneri, 2011; C. Lindström et al., 2010; Caisa Lindström, Aman, Anderzen-Carlsson, & Lindahl Norberg, 2016), a literature review hypothesized an overlap between burden and parental burnout in parents with children with special needs (Lebert-Charron, Wendland, et al., 2018). The present study did not corroborate this hypothesis given that many mothers can have a severe burden without showing manifestations of parental burnout (see APB cluster in Table 3). Gérard and Zech (2019) argued that burden and caregiver burnout may share some similarities, especially because of the vague definition of burden.

In the present study, high levels of intimacy, commitment, and passion in a love relationship were negatively associated with parental burnout. These results are innovative, as love in relationship has not been studied in association with parental burnout. However the effect size are weak for the love in relationship and parental burnout. Only marital satisfaction has been evaluated as a protective factor against

parental burnout (Caisa Lindström et al., 2011; Mikolajczak, Raes, et al., 2018; Riva et al., 2014). However, intimacy and commitment mediate the association between attachment style and marital satisfaction (Madey & Rodgers, 2009). The effect of intimacy and commitment on parental burnout requires further study for evaluating whether these dimensions have a direct or indirect impact on parental burnout through marital satisfaction. With the three dimensions (i.e., intimacy, passion, commitment), Sternberg (1997) explained that a triangle can be constructed with a dimension for the three triangle vertices. When the real triangle (i.e., the real triangle of the relationship) does not match the ideal triangle (i.e., the levels of intimacy, passion, and commitment the person dreamed about for the relationship), the consequence is dissatisfaction in the relationship (Sternberg, 1997). This underlines the impact of the three dimensions of love on relationship satisfaction and possibly on parental burnout. Engel, Olson, and Patrick (2002) explained that conscientiousness (i.e., the Big Five factors) is a significant predictor of intimacy and passion, and Le Vigouroux, et al. (2017) showed that conscientiousness protects against parental burnout. So, intimacy and passion may mediate the links between conscientiousness and parental burnout for mothers living with a spouse. These results support the hypothesis that love improves mental health and may be seen as resource in prevention or intervention strategies in the parental burnout field. Based on our results and those from previous studies on the impact of love on health, we hypothesize that love has a circular relationship with parental burnout, so that the more complete the love is, the less parental burnout and the more love are present.

Sociodemographic factors explained 8% of the parental burnout variance (Sorkkila, 2018). These factors are often harmful because, unfortunately, not all of them are modifiable through social or therapeutic intervention. Nonetheless, they deserve attention because they can facilitate the identification of vulnerable mothers.

Here, job and housing satisfaction were negatively associated with parental burnout. Our results are consistent with that of Caisa Lindström, Åman, and Norberg (2011), who showed that stress at work increases the risk of parental burnout. We hypothesize that being satisfied with one's own work may constitute a source of fulfilment other than parenthood, thus allowing the parent not to seek fulfilment exclusively in parenthood. In fact, the professional area could constitute a type of

personal parenthesis allowing the parent to endure difficulties in parenting, and consequently could be seen as an external resource.

Regarding housing satisfaction, only Mikolajczak et al. (2018) showed an absence of any significant association between house area and parental burnout. However, housing area and housing satisfaction are not exactly comparable. It can be hypothesized that, if parents are satisfied with their housing, this can be an additional resource that enables them to better bear their life as parents, as the tasks inherent to parenthood are almost always done at home. This hypothesis is in line with the theory of conservation of resources (Hobfoll, 1989).

Our results on the number of children at home are consistent with the literature [Kawamoto et al. (2018), Le Vigouroux and Scola (2018), Lindahl Norberg et al. (2014) and Mikolajczak et al. (2018)]. Having fewer children reduces the number of parental stressors. Nevertheless, it is widely agreed that burnout occurs through the sum and chronicization of stressors (Truchot, 2004).

Finally, the APB cluster is the most represented cluster including 49.31% of mothers. Thus, this study shows that one mother out of two is doing well and does not report any manifestation of parental burnout. The over-representation of this cluster seems logical in this general population, although it also indicates that very many mothers are suffering from manifestations of parental burnout, therefore emphasizing the crucial need of setting up prevention strategies.

Clinical implications and prevention strategies

First, emotional exhaustion levels in the MMPB and HMPB clusters are highest in these two clusters and lowest in the APB cluster. On the other hand, in the most extreme VHMPB cluster, emotional exhaustion has a lower level than the other 3 dimensions. This is an important result from a clinical point of view. Indeed, it highlights that emotional exhaustion is the most commonly reported manifestation by mothers with moderate to high levels of parental burnout. When parental burnout becomes very severe, emotional distancing and contrast are the highest. Thus, mental health professionals must pay particular attention to the different manifestations reported by the mothers in order to assess the severity of parental burnout (i.e. levels of contrast and emotional distancing vs level of emotional exhaustion).

Considering prevention, mothers who present either symptoms of depression or anxiety, or who have a child under one year old and have symptoms of postnatal depression, or who care for a child with special needs and show symptoms of burden, should be screened for parental burnout by health and social professionals (e.g., doctors, nurses, welfare workers). Mothers at risk of parental burnout can be invited to fill out a parental burnout assessment questionnaire. If the mother is in parental burnout, the professional refers her to a mental health professional able to provide care and support, and if the mother is at risk, but not yet in parental burnout, the professional can suggest that she consult a psychologist or other mental health professionals who can help her develop her resources. It is important that the professional keep in mind the mother's vulnerability.

Second, the results of the present study have clinical implications for intervention strategies. In this sense, our results highlight the importance of increasing the focus on reducing anxious and depressive symptoms for the overall population of parents, and in particular for the mothers of children with special needs, to decrease the impact of exhaustion induced by the care of such children.

Limitations and implications for future studies

Firstly, the self-section bias of the sample limits the external validity of the conclusions. Moreover, the data relating to anxiety and depression are based on self-report and were not validated by clinical assessment. The cross-sectional design does not allow us to conclude on the nature of the impact of the variables on parental burnout. Moreover, the TLS has not been validated in a French-speaking sample. The sample is only composed of mothers, and it is impossible to know to what extent we would find the same clusters in a sample composed of fathers. Finally, it might be interesting to identify clusters in a population of mothers with mental disorders and other at-risk conditions (e.g., personality disorders). In future studies, when the cut-offs on the PBA will be validated, it would also be interesting to compare our clusters with it. Likewise, it would be relevant to explore if burden and parental burnout overlap or if they are distinct concepts.

Conclusion

Five clusters of at-risk mothers were identified regarding their level on the four dimensions of parental burnout. The associated factors of the profiles significantly differ between the five clusters and present new insight for prevention and intervention strategies for parental burnout. This study explored the weight of affective factors, love in the relationship, and sociodemographic factors on parental burnout by identifying five different profiles of mothers according to their scores on the dimensions of parental burnout. Identifying such profiles provides the opportunity to promote the prevention of parental burnout and to promote intervention programs. This study is one of the first to determine clusters of mothers at risk of parental burnout, and the first to use the four dimensions of parental burnout to identify profiles. The results highlight the specificity of the dimension of emotional distancing. This dimension was high in the MED cluster, which led us to hypothesize that this profile is composed of a very specific population of mothers (e.g., those with personality disorders).

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Authorship

All authors contributed to the study design. Testing and data collection were performed by A.L.C. A.L.C. performed the data analysis and interpretation under the supervision of E.B. and G.D. A.L.C. drafted the paper, and E.B., J.W. and G.D. provided critical revisions. All authors approved the final version of the paper for submission.

Declaration of Conflicting Interests

A.L.C., J.W., E.B. and G.D. declared no conflicts of interest with respect to the authorship or the publication of this article.

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Journal Pre-proof

	1	2	3	4	5	6	7	8	9	10	11	12
1- PBA - Emotional Exhaustion	1	,883**	,808**	,735**	,959**	,499**	,640**	,630**	,559**	-,294**	-,131**	-,207**
2- PBA - Saturation	,883**	1	,841**	,764**	,947**	,430**	,565**	,625**	,558**	-,299**	-,171**	-,243**
3- PBA - Contrast	,808**	,841**	1	,766**	,923**	,458**	,607**	,477**	,569**	-,287**	-,159**	-,219**
4- PBA - Emotional Distancing	,735**	,764**	,766**	1	,837**	,389**	,554**	,458**	,478**	-,275**	-,165**	-,238**
5- PBA - Total	,959**	,947**	,923**	,837**	1	,495**	,649**	,605**	,600**	-,312**	-,162**	-,238**
6- Anxiety	,499**	,430**	,458**	,389**	,495**	1	,546**	,371**	,678**	-,254**	-,130**	-,165**
7- Depression	,640**	,565**	,607**	,554**	,649**	,546**	1	,449**	,740**	-,384**	-,226**	-,298**
8- Burden	,630**	,625**	,477**	,458**	,605**	,371**	,449**	1	0.262	-,161*	-0.034	-0.128
9- Postnatal depression	,559**	,558**	,569**	,478**	,600**	,678**	,740**	0.262	1	-,464**	-,260**	-,319**
10- TLS - Intimacy	-,294**	-,299**	-,287**	-,275**	-,312**	-,254**	-,384**	-,161*	-,464**	1	,821**	,848**
11- TLS - Engagement	-,131**	-,171**	-,159**	-,165**	-,162**	-,130**	-,226**	-0.034	-,260**	,821**	1	,809**
12- TLS - Passion	-,207**	-,243**	-,219**	-,238**	-,238**	-,165**	-,298**	-0.128	-,319**	,848**	,809**	1

** $p < .001$ * $p < .05$

Table 1: Pearson correlation between all the studied variables (N=1306)

	Absence of Parental Burnout APB n= 644	Middle Manifestations of Parental Burnout MMPB n=234	Moderate Emotional Distancing MED n=142	High Manifestations of Parental Burnout HMPB n=162	Very High Manifestations of Parental Burnout VHMPB n=124	ANOVA			
	Mean (SD)					F	df	p	Post-hoc (d-cohen)
Affective variables									
Anxiety	8.64 (3.58)	11.09 (3.55)	11.57 (3.65)	12.60 (3.41)	14.12 (4.11)	92.04	4 ; 1305	<.001	1<2 (0.69) ; 1<3 (0.82) ; 1<4 (1.12) ; 1<5 (1.49) ; 2<4 (0.43) ; 2<5 (0.81) ; 3<5 (0.66) ; 4 <5 (0.41)
Depression	4.63 (3.03)	7.21 (3.33)	7.84 (3.44)	9.62 (3.31)	12.35 (3.71)	199.20	4 ; 1305	<.001	1<2 (0.83) ; 1<3 (1.03) ; 1<4 (1.62) ; 1<5 (2.45) ; 2<4 (0.73) ; 2<5 (1.48) ; 3<4 (0.53) ; 3<5 (1.26) ; 4 <5 (0.78)
Burden (n=228)	12.89 (8.81) n=83	19.17 (7.20) n=41	20.26 (10.69) n=22	25.73 (10.28) n=43	28.51 (11.21) n=35	23.15	4 ; 227	<.001	1<2 (0.76) ; 1<3 (0.80) ; 1<4 (1.38) ; 1<5 (1.63) ; 2<4 (0.74) ; 2<5 (1.01) ; 3<5 (0.75)
Postnatal depression (n=275)	7.62 (5.53) n=143	11.76 (5.88) n=55	11.74 (5.21) n=31	15.04 (6.00) n=26	20.80 (4.03) n=20	32.66	4 ; 274	<.001	1<2 (0.74) ; 1<3 (0.75) ; 1<4 (1.32) ; 1<5 (2.45) ; 2<5 (1.66) ; 3<5 (1.89) ; 4 <5 (1.10)
Love in relationship (n=1144)	n=567	n=206	n=127	n=141	n=103				
Intimacy	91.09 (19.12)	82.38 (22.23)	85.98 (18.48)	78.77 (22.67)	71.87 (20.83)	27.56	4 ; 1143	<.001	1>2 (0.44) ; 1>4 (0.62) ; 1>5 (0.99) ; 2>5 (0.48) ; 3>4 (0.35) ; 3>5 (0.72)
Commitment	87.82 (19.55)	83.67 (21.71)	85.99 (19.28)	82.63 (20.23)	76.42 (22.06)	8.12	4 ; 1143	<.001	1>5 (0.57) ; 2>5 (0.33) ; 3>5 (0.47)
Passion	74.53 (21.98)	67.60 (23.87)	68.85 (22.08)	64.77 (23.04)	57.63 (24.07)	15.88	4 ; 1143	<.001	1>2 (0.31) ; 1>4 (0.44) ; 1>5 (0.76) ; 2>5 (0.42) ; 3>5 (0.49)
Sociodemographic									
Age of the mother	36.73 (7.31)	34.97 (6.26)	35.92 (5.93)	35.22 (6.37)	35.47 (6.14)	3.96	4 ; 1305	<.001	1>2 (0.25)
Work satisfaction (n=787)	7.19 (1.66) n=412	6.77 (2.02) n=145	6.54 (1.73) n=89	6.34 (1.82) n=83	5.55 (2.30) n=58	13.53	4 ; 786	<.001	1>3 (0.39) ; 1>4 (0.50) ; 1>5 (0.94) ; 2>5 (0.58) ; 3>5 (0.50)
Accommodation satisfaction	6.04 (1.45)	5.68 (1.53)	5.72 (1.51)	5.37 (1.65)	5.17 (1.55)	13.06	4 ; 1305	<.001	1>2 (0.24) ; 1>4 (0.45) ; 1>5 (0.59) ; 2>5 (0.33) ; 3>5 (0.03)
Number of children	1.92 (.89)	1.96 (.91)	2.21 (1.14)	2.20 (.95)	2.27 (.88)	7.40	4 ; 1305	<.001	1<3 (0.31) ; 1<4 (0.31) ; 1<5 (0.39) ; 2<5 (0.34)
Number of children under 5	.75 (.73)	1 (.70)	.86 (.76)	1.01 (.74)	1.05 (.90)	9.28	4 ; 1305	<.001	1<2 (0.35) ; 1<4 (0.36) ; 1<5 (0.39) ;

Table 2: Between-cluster differences for affective variables, love in relationship and sociodemographic variables (ANOVA) (N=1306)

	APB N= 644 N (%)	MMPB N=234 N (%)	MED N= 142 N (%)	HMPB N=162 N (%)	VHMPB N=124 N (%)	χ^2	df	p
Mothers having child with special needs (N=228)	85 (37.28%)	41 (17.98%)	23 (10.09%)	44 (19.10%)	35 (15.35%)	257.38	1 ; 176	p<.001
Mothers having severe burden (N=118)	20 (16.95%)	22 (18.64%)	13 (11.02%)	35 (29.66%)	28 (23.73%)	52.18	1 ; 4	p<.001
Mothers in postpartum (N=275)	143 (52%)	55 (20%)	31 (11.27%)	26 (9.45%)	20 (7.27%)	221.33	1 ; 116	p<.001
Mothers in postpartum depression (N=107)	28 (26.17%)	25 (23.36%)	15 (14.02%)	19 (17.76%)	20 (18.69%)	68.81	1 ; 4	p<.001

Table 3: Comparison of the number of mothers having children with special needs, severe burden, in postpartum and in postpartum depression according to clusters (N=1306)

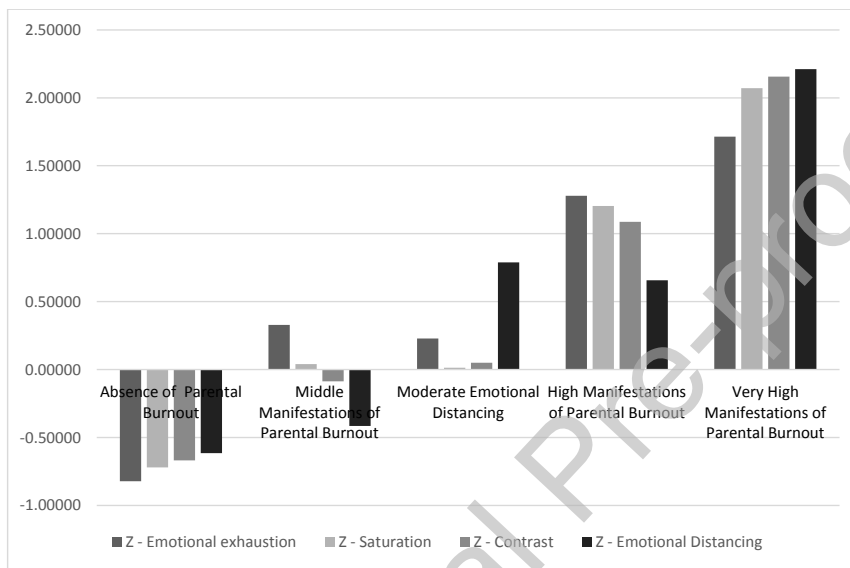


Figure 1: Clusters solution regarding the z-scores of emotional exhaustion, emotional distancing, contrast and saturation