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Within-couple comparison of maternal and paternal distress in an Italian birth cohort

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Abstract

Objective This study compared parental distress in 166 couples, using the Parenting Stress Index–Short Form (PSI-SF), in the Italian NASCITA cohort at the two-year well-child visits. The study explored the concordance of distress levels within couples (aim 1) and their correlation with child-related stressors (aim 2).

Background Previous studies focused on maternal distress or considered maternal and paternal experiences separately, without addressing differences within couples.

Method Data on parental distress were collected from the PSI-SF completed separately by parents. The total score was derived from three subscales, with high distress defined by a score above 85. The Wilcoxon signed-rank test compared the total PSI-SF scores of mothers and fathers. The prevalence of high distress was assessed using chi-square tests, and concordance between parents within the same couple was estimated using Cohen's K statistic. Chi-square tests were also used to compare distress levels in parents exposed to potential child-related stressors versus those not exposed.

Results A slightly higher total score ($z = -2.45$; $p = 0.01$) was observed in mothers versus fathers, although the prevalence of distress was similar (15.1% vs. 13.9%, respectively; $p = 0.76$). Nine children (5.4%) had both parents distressed. Agreement in the high level of distress was observed for 81.9% of the couples, with a fair agreement on the total score (Cohen's $K = 0.27$). The percentage of children with both distressed parents was slightly higher in the group exposed to potential stressors (6.6% vs. 4%, $p = 0.49$).

Conclusions It is essential to evaluate distress in parents exposed to potential stressors related to child characteristics early. This assessment should be part of the pediatric family practice to prevent adverse outcomes in both child and parental wellbeing.

Keywords Parental distress, Within-couple distress agreement, Child risk factors, PSI-SF

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Introduction

Transition to parenthood is a psychological and developmental complex process characterized by several personal and family changes. These changes require adjustment, as the birth of a baby often profoundly impacts lifestyle, sleep patterns, couple relationships, and personal identity [1].

Becoming a parent involves various dimensions, not limited to caregiving activities; other fundamental aspects are the infant's characteristics, family dynamics, and the individual personalities and psychological resources of the parents [2]. Abidin (1995) conceptualized parenting stress as the difficulty adjusting to the parenting role. This stress is influenced by perceptions of parental competence, the child's behavior, and the parent-child relationship [3–6]. Psychological distress may arise when parents perceive a discrepancy between parenting needs and their parental resources. High parent distress levels may compromise daily childcare and be associated with parental and children's psychopathology [7, 8].

Research suggests that parents who experience moderate amounts of parenting stress may engage in less optimal parenting [9, 10], which can affect children's skills development and behavioral outcomes [11]. McBride et al. (2002) found that fathers perceive more sociable children as less stressful, while mothers report lower stress with less active children [12]. These findings underscore the importance of examining the distinct roles of both parents in understanding how stress affects child development. Additionally, given that parenting requires effort from both parents, parenting stress may also result from the interaction between maternal and paternal parenting stress [12, 13]. Other parental characteristics, such as sensitivity, dyadic pleasure, and quality of caregiving, have also been linked to parental distress [14, 15].

Lastly, consistent with ecological theory [16], there are likely bidirectional influences between all these levels, increasing the complexity of the possible outcomes of distress in the parental couple. For instance, a recent review [17] which analyzed parental, child and situational factors related to parenting stress in both mothers and fathers, found that maternal depression, child overall problems, social support and maternal education level were associated with maternal parenting stress.

Numerous studies have employed the Parenting Stress Index–Short Form (PSI-SF) [3] to explore the role of parenting stress in the development of a dysfunctional parent-child relationship [18–20]. However, despite the call for including both parents' perspectives, research has predominantly focused on mothers or treated maternal and paternal stress as separate entities [21]. Considering the lack of data from fathers in family research [22–24], it is fundamental to consider both maternal and paternal distress when exploring potential risk

factors that may affect parental wellbeing and children's neurodevelopment.

Starting from these premises, the present study aims to compare parental distress among 166 couples of mothers and fathers participating in an Italian birth cohort study (NASCITA). Specifically, the degree of concordance in high distress levels within parental couples will be analyzed (**aim 1**), and if the distress levels can be associated with specific stressors related to child characteristics at two years of age will be explored (**aim 2**).

Methods

In the NASCITA study [25–27], Italian children were recruited and monitored by the pediatricians during the two and three years old well-child visits. Some questionnaires on infants' neurodevelopment and parental psychological well-being were added [27]. In particular, data on parental distress was collected through the PSI-SF, completed separately by mothers and fathers. The PSI-SF consists of 36 items measuring stress levels within the parent-child relationship. The respondent is asked to answer each item on a five-point Likert scale, ranging from 1 (strongly agree) to 5 (strongly disagree). The questionnaire yields a total stress score from three subscales (Parental Distress subscale "PD"; Parent-Child Dysfunctional Interaction subscale "P-CDI"; Difficult Child subscale "DC"). High distress levels were considered in parents with a total stress score above the 85th percentile or a raw score above 85 [28]. The Italian version of the PSI has been previously validated for use with an Italian population [29]. The analyses focused on mothers and fathers belonging to the same couple. First, the percentage of mothers/fathers with high distress level was estimated. Second, the agreement between parents (negative-negative+positive-positive couples) was calculated, and the concordance in the occurrence of high distress levels between parents was estimated using κ statistics (Cohen's κ).

Univariate analyses (Chi-square tests) compared the above indicators in parents exposed vs. not exposed to potential stressors related to child characteristics. The potential stressors considered were having children with warning signs for a neurodevelopmental disorder (as described elsewhere [27]), sleep disorders, congenital malformations, or born preterm or with low birth weight [17, 27]. The Wilcoxon signed-rank test compared the means of the total score of mothers and fathers in the overall sample and those exposed vs. not exposed to stressors.

The study was approved by the Fondazione IRCCS Istituto Neurologico Carlo Besta's Ethics Committee (February 6th, 2019, protocol n. 59). Informed consent to participate in the study was obtained from the parents.

Results

In the NASCITA cohort study, for 397 children at least one parent accepted to fill the PSI-SF at the two years well-child visit ($n=368$ mothers and $n=195$ fathers). For 166 children the PSI questionnaire was available for both parents. The mean maternal age at delivery was 32.3 years (median 33), and the mean paternal age was 36 years (median 35.5). A total of 25 mothers and 23 fathers presented high distress levels.

The prevalence of distress was assessed (**aim 1**). A slightly higher distress **prevalence** was observed among mothers than fathers (15.1% vs. 13.9%, respectively), although this difference did not reach statistical significance ($p=0.76$). Nine children (5.4%) had both parents distressed. The most relevant symptoms were found in the DC subscale for mothers (28.9%) and fathers (22.8%). A higher **total score** ($z=-2.45$; $p=0.01$) and **PD subscale score** ($z=-3.36$; $p=0.0008$) were observed in mothers vs. fathers, while no statistically significant differences emerged for DC and P-CDI scores (Table 1).

Looking at the PSI **agreement** between maternal and paternal outcomes, 81.9% of the involved parents were both positive or negative to high distress in the total score, ranging from 77.2% (in the DC subscale) to 86.1% (in the P-CDI subscale). Cohen's K revealed a moderate agreement in the DC subscale (0.41) and a fair agreement (0.22) in the P-CDI, while in the PD subscale, the agreement was none to slight (0.17). Cohen's K for the total score scale was fair (0.27).

The same analysis was then conducted by clustering all the risk variables to compare the agreement between parents exposed to potential stressors and parents not exposed (**aim 2**). The **prevalence** of distress among exposed and not exposed parents differed slightly: in the exposed couples it was 19.8% in mothers and 15.4% in fathers ($p=0.43$), while in the not exposed couples it was 9.3% and 12%, respectively ($p=0.60$). The agreement between parents was marginally higher among not exposed parents (86.7% vs. 78.0%; $p=0.16$) (Table 2). The prevalence of distress had a more pronounced tendency to differ in exposed and not exposed mothers ($p=0.06$) rather than fathers ($p=0.53$). No significant differences were reported in the comparison between **total stress scores** of exposed and not exposed mothers ($p>0.3$) and fathers ($p>0.1$). The total score was slightly higher in mothers than in fathers in the not exposed group

($z=-2.32$; $p=0.02$), and not in the couples exposed to potential stressors ($z=-1.17$; $p=0.17$).

Cohen's K was lower in exposed parents (0.24 vs. 0.30), but the differences were not statistically significant.

Overall, the percentage of children with both parents distressed was slightly higher in exposed versus not exposed parents (6.6% vs. 4.0%). A significantly greater prevalence of parents positive-positive to distress was observed in the PCDI subscale: 18.7% in exposed vs. 0 in not exposed ($\chi^2=16.45$; $p<0.01$). A similar trend was observed for the DC subscale, even if not significant. These percentages are described in Table 2.

Discussion

This study is one of the few that analyze parenting stress in mothers and fathers of typically developing children while considering possible risk factors related to child characteristics. The **first aim** was to evaluate the degree of concordance in high distress levels within parental couples. The findings highlighted that high distress levels affected nearly 1 out of 7 parents, with no relevant differences between mothers and fathers. However, when considering the DC subscale, this proportion increased to 1 out of 4. Additionally, 82% of parental couples shared the same distress level, and 5% of the children had both parents reporting high distress.

In general, although most parents (80%) demonstrated an agreement in the absence/presence of distress, the overall concordance between maternal and paternal distress was relatively low, except for the DC subscale.

Interestingly, higher overall PSI scores were observed in mothers, particularly among couples not exposed to potential stressors (although the mother/father prevalence of high distress levels did not differ). These findings are consistent with a recent Italian study [30] which analyzed parenting stress and emotional-behavioral difficulties in pre-school children, supporting that even if mothers and fathers have similar levels of stress in interacting with their children, mothers experience higher levels of stress in assuming their parental role.

The **second aim** was to evaluate whether parental distress levels can be associated with specific stressors related to child characteristics. A higher agreement was observed among parents not exposed to potential child-related stressors. In contrast, the group exposed to such stressors showed a higher percentage of children with

Table 1 Comparison of maternal and paternal scores at PSI-SF (Wilcoxon signed-ranks test)

Subscale	Mothers*	Fathers*	Median difference (95%CI)	z-score	p-value
DC	24 (19–30)	23 (18–28)	-1.00 (-2.00 to 0)	-1.97	0.05
PCDI	17 (15–20)	18 (15–21)	0 (-0.50 to +0.50)	-0.08	0.94
PD	24 (20–30)	23 (19–28)	-2.00 (-3.00 to -0.50)	-3.36	0.0008
Total	68 (58–77)	64 (55–76)	-2.50 (-4.5 to -0.50)	-2.45	0.01

*Median and interquartile range. PD: Parental distress; P-CDI: Parent-Child Dysfunctional Interaction; DC: Difficult child

Table 2 Distribution for high level of stress at PSI total score and subscales of parents (number and percentage) exposed/not exposed to potential stressor; parents were classified into those who both had a negative outcome, both a positive outcome, and those who had different outcomes according to the PSI. The bottom row reports the concordance between maternal and paternal outcome calculated with Cohen's K

	Total score			PD			P-CDI			DC		
	Exposed	Not exposed	TOT	Exposed	Not exposed	TOT	Exposed	Not exposed	TOT	Exposed	Not exposed	TOT
Negative-Negative	65 (71.4)	62 (82.7)	127 (76.5)	73 (80.2)	61 (81.3)	134 (80.7)	51 (56.0)*	65 (86.7)*	116 (69.9)	51 (56.0)	53 (70.7)	104 (62.7)
Positive-Positive	6 (6.6)	3 (4.0)	9 (5.4)	5 (5.5)	2 (2.7)	7 (4.2)	17 (18.7)*	0 (0.0)*	17 (10.2)	17 (18.7)	7 (9.3)	24 (14.5)
Negative-Positive	20 (22.0)	10 (13.3)	30 (18.1)	13 (14.3)	12 (16.0)	25 (15.1)	23 (25.3)	10 (13.3)	33 (19.9)	23 (25.3)	15 (20.0)	38 (22.9)
Total	91 (100.0)	75 (100.0)	166 (100.0)	91 (100.0)	75 (100.0)	166 (100.0)	91 (100.0)	75 (100.0)	166 (100.00)	91 (100.0)	75 (100.0)	166 (100.00)
K (Estimate, SE)	0.24 (0.13)	0.30 (0.17)	0.27 (0.10)	0.16 (0.14)	0.17 (0.15)	0.17 (0.10)	0.35 (0.14)	-0.06 (0.02)	0.23 (0.11)	0.41 (0.11)	0.37 (0.13)	0.41 (0.08)

* $p < 0.001$ exposed vs. not exposed; SE: standardized error; PD: Parental distress; P-CDI: Parent-Child Dysfunctional Interaction; DC: Difficult child

both parents reporting distress, particularly in the Parent-Child Dysfunctional Interaction and Difficult Child subscales.

Previous studies have suggested an association between children's characteristics (e.g., overall problems, externalizing and internalizing behaviors, neurodevelopmental disorders) and higher levels of parenting stress, with mixed results concerning a greater influence on mothers or fathers [17, 31]. However, the results of the present study did not find significant differences in maternal and paternal scores between those in the exposed vs. in the not exposed group. These results should be interpreted considering that the evaluation was performed at 24 months of age, when neurodevelopmental disorders may still not be recognized, while other studies were performed at a later age or involved clinical populations (e.g., parents or children suffering from a specific disease or impairment). For example, one study [32] specifically focused on parenting stress and child behavior problems in different clinical groups (i.e., ASD/DD, chronic illness, with or at-risk for behavioral and/or mood disorders). It was demonstrated that the association between parenting stress and behavior problems was stronger among studies which had mostly male and clinic-recruited samples (such as ASD and developmental delay). This study's findings showed a slightly higher prevalence of distress was observed in parents exposed to potential stressors, but the differences were not statistically significant.

Our results also highlighted differences in parental concordance across PSI subscales. While the DC subscale seemed to be a good marker of general distress (both for higher prevalence and higher agreement), higher percentages of distressed couples emerged in the P-CDI subscale when looking at the parents exposed to potential stressors. This could be due to the fact that this subscale is the one most related to "dyadic interactive aspects" of the parent-child relationship. Thus, if the child presents potential stressors, this may disrupt the interaction with the caregiver more than quantitative estimates of parental stress.

The study has some limitations, particularly the small sample size, which may have impacted the statistical power. The lack of significant differences in parental distress between the exposed and not exposed groups may also be due to the limited sample size. Additionally, the sample consisted of volunteer families recruited by pediatricians, which could introduce selection bias, limiting the generalizability of the findings.

Nonetheless, the observed trends suggest an important relationship between child vulnerability and parental distress. It may be that parents of children with early adverse factors experience increased levels of stress [33] or that when parents are distressed, children are more likely to develop behavioral or emotional difficulties. Pediatricians

should be aware of these dynamics, as several parenting interventions have proven effective in reducing parenting stress and improving child outcomes through scaffolding parenting support, increasing knowledge, and promoting self-regulation [34, 35].

In conclusion, this study emphasizes the importance of considering both maternal and paternal stress when evaluating parental well-being and potential stressors related to child characteristics. Future research should continue to explore the interaction between parental distress and child development, especially in larger, more diverse samples, to further elucidate these complex relationships.

Abbreviations

DC	Difficult Child subscale
P-CDI	Parent-Child Dysfunctional Interaction subscale
PD	Parental Distress subscale
PSI-SF	Parenting Stress Index–Short Form

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Author contributions

MB and GS conceptualized and designed the study, directed the study's implementation, and drafted the initial manuscript. AC drafted the initial manuscript, helped to interpret the findings and supervised the study's implementation. ER participated in the conceptualization and design of the study, critically reviewed the manuscript for important intellectual content, and provided input into data analysis. RC participated in the conceptualization and design of the study and carried out the statistical analyses. All authors reviewed and revised the manuscript, approved the final manuscript as submitted, and agreed to be accountable for all aspects of the work.

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Data availability

Data available from the corresponding author upon request.

Declarations

Ethics approval and consent to participate

The study was approved by the Fondazione IRCCS Istituto Neurologico Carlo Besta's Ethics Committee (February 6th, 2019, protocol n. 59). All participating parents gave their informed written consent. Parents provided consent also for their children's participation.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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