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A web-delivered group intervention supporting parental sensitivity and self-efficacy: an Italian pilot study

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Abstract

**Background:** Stable parent-infant relationships and adequate ordinary care significantly support children's development since the very early stages of life. Principal models of intervention sustain parental skills and foster quality of parent-infant interactions since the early infancy. Standardized programs, with a well-defined focus, of short duration, based on specific methods and techniques, represent an effective tool in supporting parental effort. The present pilot study provides a description and an initial evaluation of the brief online "Con i Genitori" (CiG) Intervention, aimed to enhance parental sensitivity, self-efficacy and reduce stress in parents of typically-developed children aging 0-6 years.

**Methods:** The intervention involved parents of typically-developed children aging 0-6 years. Four interactive group sessions, based on well-known empirically-based programs' assumptions were delivered. Participants were asked to complete questionnaires at baseline (T0) and after CiG (T1). The assessment included the Tool to measure Parenting Self-Efficacy (TOPSE; Kendall & Bloomfield, 2005), Parenting Stress Index-SF for parental distress (PSI; Abidin, 1996), Emotional Regulation Checklist for children's emotional regulation (ERC; Shields & Cicchetti et al., 1997) and Social Provision Scale for social support (SPS; Cutrona and Russell, 1987). A weekly "ad-hoc" questionnaire evaluated parental sensitivity. Moreover, a semi-structured interview measured participants' satisfaction and acceptability with the intervention one month after its end.

**Results:** Twelve parents completed all the sessions of the CiG (10 mothers, 2 fathers with mean age = 42.7; SD= 6.3). Children mean age was 3.9 (SD=1.9), 58.3% male. Our results showed statistically significant decrease in parental distress and increased social support after attending CiG. No statistically significant variations were detected considering parental self-efficacy.

**Conclusions:** Our findings confirm the potential value of online-delivered interventions targeting parenthood in infancy, supporting parent-infant relationship and positive parenting from early infancy in a public health community approach. Online delivered programs constitute an important resource for addressing unmet parent mental health needs, which may be particularly widespread following the COVID-19 pandemic, representing a valuable alternative to traditional face-to-face interventions targeting parental wellbeing in infancy.

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## 1. Introduction

Stable and significant parent-infant relationships and adequate caregiving significantly support children's development (Bowlby, 1969). Standardized interventions with a well-defined focus, of short duration, and based on specific methods are effective tools to support parenting along infancy (Bakermans-Kranenburg et al., 2003).

Since the COVID-19 pandemic in March 2020, strict policies have been in place to protect people from infection. This major health problem has impacted lives of people all around the world in a sudden and unprecedented manner (Pedrosa et al., 2020). Concerning the Italian experience, since March 2020, strict control policies were applied in order to protect people from infection, disrupting everyday life for individuals and families (Cusinato et al., 2020; Brown et al., 2020; Nicoli et al., 2022). Potential long-term adverse consequences on parenting, as well as concerns for children's mental health have been hypothesized since the very beginning of pandemic (Giordano et al., 2023; Morelli et al., 2020; Shen et al., 2020; Dillman, Sensoy & Schwarzer, 2022; Trumello et al., 2022; Frigerio et al., 2023; López-Morales et al., 2023).

During that period, the access to clinical programs has been often impeded for many families, who were not able to seek for professional help, even in spite of special needs for pre-existent health risk conditions (Gillespie-Smith et al., 2023). Dimensions of positive parenting appeared as a crucial protective factor for children emotional well-being, mediating the relationship between parental psychological distress and children's adjustment (Morelli et al., 2020).

The need of mental health prevention and intervention programs supporting parenting has been promptly pointed out (Fontanesi et al., 2020; Morelli et al., 2020), in order to sustain parents' personal strengths, effective parenting strategies and children's adjustment. Programs aiming to foster and improve parental sensitivity, responsiveness, non-harsh discipline and parenting self-efficacy are associated with an enhancement of quality of everyday interactions and infant attachment bonds and are well described in literature (Jeon et al., 2020; Borelli et al., 2021; Kohlhoff & Cibralic, 2022; Linhares et al., 2022; Havighurst et al., 2022).

According to Mary Ainsworth definition of "parenting sensitivity", "sensitive parents" appear able to focus on, interpret, and respond to their children's signals in an appropriate way, assuming their perspective when considering their needs (Ainsworth, 1972). As reported by Deneault and colleagues (2022), extensive meta-analytical work has reported the strong association between maternal sensitivity and various aspects of children's development. Specifically, studies conducted by De Wolff and Van IJzendoorn in 1997, as well as research by Verhage and colleagues in 2016, have consistently linked maternal sensitivity to children's secure attachment. Additionally, investigations led by Madigan et al. in 2019 have found that maternal sensitivity is positively correlated with language development in children and early cognitive

skills and development (Prime et al., 2023). Moreover, research conducted by Cooke and others in 2022 has revealed a significant relationship between maternal sensitivity and children's social functioning. These collective findings highlight the crucial role of maternal sensitivity in fostering positive outcomes in children's emotional, linguistic, and social growth.

In addition, parenting self-efficacy profoundly influence various aspects of children's development as well, including their psychosocial, neurodevelopmental, and overall health outcomes from an early age (Yap et al., 2019; Fang et al., 2022). It can be defined as parents' confidence in their own parenting skills, in handling parental responsibilities and in their capacity to answer adequately to their children's needs (Bandura, 1977). It plays a crucial role in shaping parenting behaviors and the quality of the parent-child relationship (Jones & Prinz, 2005). High levels of parental self-efficacy are often associated with more engaged and positive parenting skills, leading to better outcomes for both parental and children's psychological wellbeing (Fang et al., 2021; Fang et al., 2022). Moreover, parents with elevated levels of parenting self-efficacy are more inclined to adopt effective and nurturing parenting practices, fostering favorable self-regulation development in their children (Albanese et al., 2019).

Considering how COVID-19 pandemic condition affected the access to clinical measures supporting parenthood, the web-delivered nature of online interventions appeared to be a promising opportunity, due to their accessibility and sustainability (Cook et al., 2021; Novianti et al., 2023). As reported by Nieuwboer and colleagues (2013), by means of web-based interventions, parents are enabled not only to enhance their knowledge concerning parenthood, but also to actively work on behavioral aspects, systematically training their parental skills. The meta-analysis conducted by Spencer and colleagues (2020) showed that online delivered programs showed to be beneficial due to their ease of use, ability to shorten waiting lists, and reduced time and costs; they are able to enhance positive parenting, positive child behavior, and parenting satisfaction (Spencer et al., 2020); negative parent-child interactions, stress, and the use of negative discipline strategies appear reduced (Florea et al., 2020; Thongseiratch et al., 2020).

A web-delivered intervention aimed at sustaining relational aspects of the parent-child bond founded on well-known evidence-based programs appears to be a resource worth considering, in a time of strain following the COVID-19 pandemic.

This paper described a new web-delivered intervention directed at a small group of parents of typically developed children: the “Con i Genitori” (CiG) intervention. We evaluated the effect of the CiG on parental sensitivity, self-efficacy, and stress. Next, we measured the perceptions of children's emotional regulation and social support at the baseline and following the

intervention. Finally, the study framed participants' individual experiences to evaluate the satisfaction and acceptability of the program qualitatively.

## **2. Materials and Methods**

### **2.1 The theoretical foundation of the CiG intervention**

The CiG intervention promotes securely attached bonds and fosters parental "sensitivity". Bowlby's assertion that children are most likely to develop a secure attachment when they have confidence in an attachment figure whom they can turn to for comfort when distressed and then use as a secure base from which to explore confidently, represents the central theoretical foundation of the CiG (Bowlby, 1988). Here, "parental sensitivity" means the ability of the caregiver to accurately perceive the child's signals, interpret them correctly, and provide them with an appropriate and prompt response (Ainsworth et al., 1978). During early infancy, increased caregiver sensitivity may reduce the risks of insecure and disorganized attachment and foster quality parent-child attachments (Bakermans-Kranenburg et al., 2003).

Based on these premises, the CiG is built on well-known "evidence-based" intervention models from the attachment theory: the "Videofeedback Intervention to promote Positive Parenting" (VIPP; Juffer, 2008) and the "Circle of Security" (COS, Powell et al., 2014). The CiG foresees using short video sequences of stock video footage to introduce parents to the main assumptions of Attachment Theory (Powell et al., 2014). The host uses video footage to share the session themes and start the dialog with the participants. The CiG used the video-feedback VIPP technique (Juffer, 2008; 2018). Each CiG session covers a specific theme borrowed from the VIPP and VIPP-SD.

### **2.2 Participants**

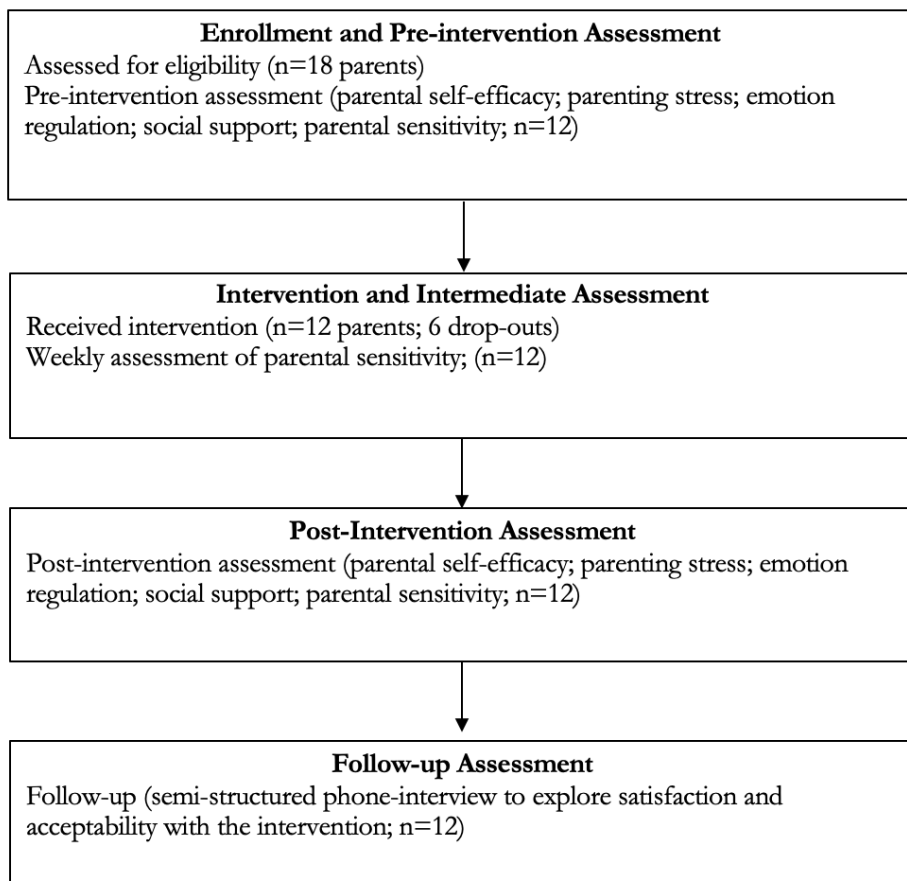
The Intervention was offered between May and November 2021. Eighteen parents of typically developed children aged 0 to 6 years in a community setting were involved.

The exclusion criteria include other ongoing psychological interventions/ therapies that support parents or parents of children with atypical developmental pathways (e.g., diagnosis of chronic disease, major neurological/neurosensory deficits). We produced an informative brochure describing the main intervention characteristics, distributed in local kindergartens, pediatricians, healthcare centers, and on social media and offered to parents free of charge. The parents were free to decide whether to join the initiative or not. A brief video-call interview with those parents wishing to join the CiG assessed their inclusion suitability, and their informed consent to take part was obtained.

The assessment included a weekly "ad-hoc" parental sensitivity questionnaire. At the baseline (T0) and after the intervention (T1), parents were asked to complete self-reporting measures to

evaluate the CiG’s effects on variables such as parental self-efficacy, stress, offspring’s emotional regulation, and levels of social support. A semi-structured phone interview was conducted one month after the intervention to explore the participants’ experiences, satisfaction, and acceptability.

Figure 1. depicts parents’ flow through the study. Twelve parents completed all the sessions of the CiG (10 mothers, 2 fathers), only one mother completed three out of four sessions. Six drop-outs were recorded.



**Figure 1.** Parents’ flow through the study

Table 1 contains summary data for the participants regarding demographic characteristics. Parents’ age ranged from 32 to 55 years (mean = 42.7; SD= 6.3). The 42% of mothers and 67% of fathers had diploma, while respectively the 58.3% and the 33.33% of them were graduated. All of them were employed (100%). For 92% of the families, parents themselves took ordinary care of their children, while just a small percentage (8%) was supported by people other than the family (kindergarten). The 50% had an only-child. Children mean age was 3.9 (SD=1.9), 58.3% male. See Table 1.

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board of LUMSA University (protocol code CERS07052020 approved on 14 May 2020).

**Table 1.** Participants' characteristics

Sample Size, <i>n</i>	12
Female, <i>n</i> (%)	10 (83)
Male, <i>n</i> (%)	2 (17)
Age, mean ( <i>SD</i> )	43 (6.2)
<i>Level of Education</i>	
- High School <i>n</i> (%)	5 (42)
- University <i>n</i> (%)	7 (58)
<i>Marital Status</i>	
- Single/Unmarried <i>n</i> (%)	2 (17)
- Married <i>n</i> (%)	10 (83)
<i>Employment status</i>	
- Unemployed <i>n</i> (%)	0 (0)
- Employed <i>n</i> (%)	12 (100)
<i>Children characteristics</i>	
Age, mean ( <i>SD</i> )	3.9 (1.9)
- Only child <i>n</i> (%)	6 (50)
- Siblings <i>n</i> (%)	6 (50)
<i>Ordinary care</i>	
- By parents <i>n</i> (%)	11 (92)
- By others <i>n</i> (%)	1 (8)

Abbreviations: SD= Standard Deviation

### 2.3 Delivery procedures

The CiG intervention comprised four 60 minutes-online sessions, once every two weeks via an online platform. It included small groups (5–7) of parents. In each session, the host shared a specific theme concerning “positive” parenting in line with the VIPP contents, using stock video

footage of daily infant-caregiver interactions. The host selected recording fragments to illustrate specific themes and provided some comments. The comments were generally focused on positive and successful interactions and showed effective positive parenting, in line with the VIPP guidelines (Juffer et al., 2008).

*SESSION 1* - The “Exploration *vs.* Attachment Behavior” session theme is introduced by a 3-minute video model of mother-infant free-play, and comments are made via the video-feedback technique. In the video model, a mother-infant dyad is invited to play in a familiar home environment in a free-play session. The theme borrowed from the VIPP shows parents the differences between a child’s contact-seeking behavior and play/exploration, and the need for different parental responses is underlined.

*SESSION 2* - The host acts as a moderator, facilitating participants’ shared experiences after the first session. The theme of the second session, borrowed from the VIPP model, concerns sensitive caregiving and shows a 3-minute video model. Like other behavior-oriented programs, the video focuses on interactive behavior and helps parents to highlight interactive issues (McDonough, 2005). The session also introduces the need to respond adequately and promptly to a child’s signal.

*SESSION 3* – Core aspects of sensitive discipline, promoting empathy for the child during discipline strategies, and clear limit-setting are introduced, according to attachment and coercion theories (Juffer & Bakermans-Kranenburg, 2018). We used the video feedback of a 4-minute video model showing a parent-infant dyad in a specific structured task.

*SESSION 4* - The fourth session is a booster session in which previous themes are integrated.

## **2.4 Instruments**

*Parental sensitivity.* Assessment included a weekly “ad-hoc” parental sensitivity questionnaire (3 items) built on a 6-point Likert Scale (“Completely agree/disagree”). The items have been conceived from the theoretical definition of “sensitivity” by Mary Ainsworth (1972), namely: #1) *Do you think you have recognized the signals your child sent to you today?* #2) *Do you think that you have given adequate answer to the signals that your child/ daughter sent you today?* #3) *Have you had a pleasant time with your child/ daughter today?*

*Parental self-efficacy.* Parenting self-efficacy was measured through the Tool to Measure Parenting Self-Efficacy questionnaire (TOPSE; Kendall & Bloomfield, 2005; Panza et al., 2020). TOPSE is a self-report measure, formed by six domains (emotion and affection, play and enjoyment, empathy and understanding, pressures of parenting, self-acceptance, learning and knowledge). Each domain is formed by 6 items asking parents to rate their agreement on a 10-point Likert

scale, summarized in a 0 to 60 score, with higher scores showing higher parental self-efficacy. For the current study Cronbach's alpha was .90 in the pre-intervention assessment and .89 in the post-intervention assessment.

*Parenting stress.* The Italian version of the Parenting Stress Index-Short Form (PSI-SF) (Abidin 1995; Guarino et al., 2006) was used to assess parental stress at T0 and T1. The PSI-SF is a 36-item self-administered questionnaire that asks parents to rate their agreement on a 5-point scale, ranging from 1 to 5 (strongly disagree-strongly agree). It yields a Total Stress Score (TSS) from three subscales, each consisting of 12 items: Parental Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), and Difficult Child (DC). High scores on the subscales and high PSI-SF total score indicate more considerable levels of stress. The PD subscale reflects the distress that a parent experiences due to personal factors associated to parental role. The P-CDI subscale measures a parent's perception that the child does not meet expectations and that parent-child interactions are not strengthening. The DC subscale assesses a parent's view of the child's behavioral characteristics that make him/her either easy or difficult to manage. For the current study Cronbach's alpha was .91 in the pre-intervention assessment and .88 in the post-intervention assessment.

*Emotion Regulation.* The Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997; Molina et al., 2014) is a 24-item parent-report measure of children's self-regulation. Items are rated on a 4-point Likert scale and it is composed by two subscales. The Lability/Negativity subscale represent a lack of flexibility, mood lability, and dysregulated negative affect. The Emotion Regulation subscale includes items describing situationally appropriate affective displays, empathy, and emotional self-awareness. The composite ERC score indicated the total emotion regulation level including both regulation and dysregulation. Internal consistencies, assessed through Cronbach's alpha, were .96 for Lability/Negativity and .83 for Emotion Regulation. The internal consistency of this composite ERC score was .89 (Shields & Cicchetti, 1997). For the current study Cronbach's alpha was .67 (Lability) and .60 (Emotional Regulation).

*Social support.* The Social Provisions Scale (SPS, Cutrona and Russell, 1987; De Stasio et al., 2020) is a 24-item self-report questionnaire that aims to assess individual perception of received social support. Parents are asked to rate their agreement on a 4-point Likert scale with items describing the social support available to them. Good test-retest reliability and convergent validity have been shown. In the current study, the "Reliable Alliance" and "Guidance" subscales were used. The Reliable Alliance subscale describes the assurance that others can be counted upon for tangible assistance. The Guidance subscales represent the possibility to ask others for advice or



support. For the current study Cronbach’s alpha was .82 in the pre-intervention assessment and .85 in the post-intervention assessment.

*Parental experience, satisfaction and acceptability with the CiG.* After the intervention, a semi-structured phone-interview was performed in order to explore participants’ experiences with the group, satisfaction and acceptability with the intervention. The semi-structured interview asked parents to refer emotions and feelings related to the CiG (*How did you feel, taking part to the CiG?*), and to consider main strengths and weaknesses of the online mode of intervention (*What would you say were the strengths/ weaknesses of the “online delivered” mode of intervention?*).

## 2.5 Data analysis

Data were analyzed using PASW Statistic version 24.0 (SPSS, Chicago, IL). Descriptive statistics (maternal, paternal and familial socio-demographic variables) are reported with categorical variables, such as number and percentage, and continuous variables such as mean (M) and standard deviation (SD). The Wilcoxon signed-rank test was conducted to examine the statistical significance of possible variations in parental self-efficacy, offspring’s emotion regulation, levels of social support, distress, anxiety and depression perceived by parents at T1.

## 3. Results

*Parental sensitivity.* Concerning the ad-hoc parental sensitivity questionnaire, some relevant improvements were observed after the intervention. Parents reporting to be “really often” able to catch their child’s signals increased from 62 to 100% while from 37 to 75% reported to give them “really often” adequate responses. The percentage of parents reporting to spend “really often” pleasant time with their children increased from 50 to 83%.

*Self-report measures.* Mean baseline levels of parental self-efficacy were not significantly different compared to T1, considering all the subscale of the measure. Parental distress significantly decreased at T1. Our data show in particular statistically significant variations in P-CDI-PSI subscale and in PSI Total score, with mean values decreasing respectively from 2.3 (SD=0.4) to 1.9 (SD=0.4) ( $p = .028$ ) and from 2.7 (SD=0.4) to 2.3 (SD=0.3) ( $p = .028$ ). By contrast, parental perception of offspring’s emotional regulation didn’t show a significant variation from T0 to T1, considering both Lability/Negativity and Emotion Regulation subscales. Social support reported by parents statistically increased at T1 ( $p = .042$ ), with mean values changing from T0 (mean= 2.9; SD=0.6) to T1 (mean= 3.5; SD=0.4). See Table 2.

**Table 2.** Wilcoxon Signed Rank Test

	Pre		Post		Z	Wilcoxon Signed Rank Test Probability
	M	SD	M	SD		
<i>Sensitivity</i>						
SENS #1	2.2	.70	1.4	.51	-1.7	.08
SENS #2	2.5	.75	2	.73	-.96	.33
SENS #3	2.6	.74	1.5	.79	-1.8	.06
<i>Self-efficacy</i>						
TOPSE – Play/enjoyment	7	1.4	7.9	.95	1.0	.27
TOPSE – Empathy/understanding	6.9	1	7.4	.65	.42	.67
TOPSE – Pressure/expectations	5.8	1.5	6.3	1.2	1.3	.17
TOPSE – Self-acceptance	6.9	1.1	7.2	1.1	.67	.49
TOPSE – Learning/knowledge	7.5	1.1	7.6	.50	.08	.93
TOPSE – Total Score	7.0	.8	7.4	.70	1.3	.17
<i>Distress</i>						
PSI – PD	2.9	.75	2.5	.63	-1.8	.6
PSI – P-CDI	2.6	.6	1.9	.41	-2.2	.02*
PSI – DC	2.8	.51	2.5	.43	-.84	.39
PSI – Total Score	2.7	.49	2.3	.38	-2.2	.02*
<i>Children's emotional regulation</i>						
ERC – Lability	2	.34	1.8	.45	-.84	.40
ERC – Emotional Regulation	3.0	.41	2.7	.34	-1.1	.23
<i>Social support</i>						
SPS – Total Score	2.9	.6	3.5	.4	2	.04*

Abbreviations: M= Mean; SD= Standard Deviation; SENS= Sensitivity; TOPSE = Tool to measure parenting self-efficacy questionnaire; PSI = Parenting stress index; PD =Parental distress; P-CDI=Parent-child difficult interaction; DC=difficult child; ERC=Emotional regulation checklist; SPS=Social provision scale. Note: N=12

*Semi structured phone interview.* All parents accepted to take part to the semi structured phone interview. Interviews were recorded verbatim and qualitatively analyzed by two independent judges to examine the experience of participants and the underlying themes. Concerning the first item “How did you feel, taking part to the CiG?”, it was possible to identify the following macro categories of content: (1) positive affects, (2) experiencing social support, (3) negative affects, (4) improving learning and knowledge. The 55% of participants pointed out positive feelings related to their experience with the group (i.e., “I felt very confident about sharing my experiences”). Around 30% of parents referred that they experienced effective support from other participants of the group (i.e., “I realized that other parents have similar experiences too!”, “I felt supported”). A small percentage of parents (9%) reported negative issues related to taking part of the group (i.e., “There should be more sessions to deepen other themes related to childhood”) and describe the group as an opportunity to wide their knowledge concerning

childhood. When parents were asked to point-out the strengths of the “online-delivered” mode of intervention, several macro categories of content were enlightened: (1) its easiness of use (2) good management of time (3) being in contact with other parents (4) safety from COVID-19. Most of participants (50%) describe that the online mode of intervention was convenient and easy to approach. The 21% of parents reported that it allowed a better management of time, avoiding moving by public or private means of transport and reducing related costs and being immediately ready to participate despite working/other family issues (i.e., “I have three young kids and I probably wouldn't have been able to participate without internet”). A modest percentage of participants (17%) believed that the online group was an opportunity to be in contact with other people, in spite of COVID-19 health condition; the online mode permit to reach people right in their daily lives, feeling free to be yourself (i.e., “(...) Be more relaxed. Feel you can speak freely”). Not meeting physically allowed participants to experience a greater sense of safety from COVID-19, according to the 8% of them. By contrast, (1) physical distance from the other participants, (2) technical problems and (3) interferences from home environment were highlighted as main weaknesses of the online-delivered sessions. In particular, 60% of parents declared to have experienced the lack of direct contact with the other participants during the sessions and before/after the meetings, with significant effects in the communicational processes (i.e., “being online doesn't always allowed us to respect "timing" of dialogue”, “being behind the screen loses some of the effectiveness of what is being said”). For a considerable percentage of parents (30%) participation has been affected by technical malfunctions, while just for a small percentage of them (10%) by difficulties in finding a quiet and reserved place at home to join the group.

#### **4. Discussions**

This paper describes a new web-delivered intervention directed at a small group of parents of typically developed children: the “Con i Genitori” (CiG) intervention. Parental sensitivity, self-efficacy, stress, perception of their children's emotional regulation, and social support were monitored at the baseline and following the intervention. The study framed participants' individual experiences to evaluate their satisfaction with and the acceptability of the program on a qualitative level.

In the last few years, much of the literature explored online interventions supporting parenting and investigated their efficacy (Spencer et al., 2020). A wide variety of context of applications have been considered, among which we can mention: prenatal or perinatal parenthood, parenting children with typical and atypical developmental pathways, parenting with specific sociodemographic risk-conditions as low socioeconomic status, single or young parenthood, sustaining children's and adolescents' mental health (Wong & Chien, 2023; Chae & Kim, 2021;

McAloon et al., 2023; MacKinnon et al., 2022; Harris et al., 2020; Broomfield et al., 2021; Connor et al., 2022).

The effectiveness of web-delivered interventions is clearly defined for both self-directed learning and remote therapist contact-type programs (Hansen et al., 2019). The association between a professional guide and peer support, as in the CiG, was described as the most effective regarding parenting attitudinal outcomes (Nieuwboer et al., 2013).

This assumption is recently confirmed by Day et al (2021) that underline the crucial role of professional support in increasing in particular parental sense of confidence in everyday childcare.

A multilevel approach is therefore required to enhance the effectiveness of online parenting programs (Harris et al., 2020).

*Parental sensitivity.* Concerning our sample, many parents reported on a percentage level increased parental sensitivity after attending the CiG. They reported to feel be more able to pick up on their child's signals, give adequate responses, and enjoy the time spent with them. The face-to-face home visiting program "Attachment and Biobehavioral Catch-up" (ABC) was recently adapted for online dissemination by Schein et al., 2023. Authors reported its positive effects on parental sensitivity and in reducing parental intrusive behaviors, referring these effects to the correct transposition of the intervention from "in person" to the online setting.

Accordingly, considering our sample, the increased parental sensitivity referred by the participants could be attributed to the nature and structure of the CiG intervention itself. Using limited and clearly defined content shared interactively can help parents understand the subject matter better. In addition, the presence of other participants and comparing their own experiences with others can support parents to reflect on their behaviors and make it easier to transfer new practices into everyday life. The changes observed in the parents' sensitivity and behaviors are attributable to the use of stock footage and video feedback techniques, which agrees with the evidence described in other studies (Juffer, 2008; Woodhouse et al., 2018). Moreover, the parents' perception of their increased ability to catch children's signals and to interpret their needs correctly, could be the referred to the online delivered nature of the program itself. In line with literature, online delivered programs are associated with increased knowledge of parenting role and children's developmental needs, affecting parenting cognition and practice of parental role, growing parent resources in child-rearing competencies (Novianti et al., 2023).

*Parental self-efficacy and stress.* Contrary to our expectations, we observed no statistically significant variations in parental self-efficacy. This finding is inconsistent with the available literature, targeting different age ranges (Holtrop et al., 2023; Lotto et al., 2022; Khor et al., 2022).

In particular, Holtrop and colleagues described an original online the evidence-based parenting program “GenerationPMTO”. The intervention foresees the use of videos to introduce contents, discuss individual experiences and to show how to use parental skills with children. Increased levels of parental self-efficacy from baseline to four weekd after program completion were reported by the authors (Holtrop et al., 2022).

The online version of the ACT-Raising Safe Kids Parenting Program described by Lotto et al (2022) shows positive effects on levels of parental sense of competence in the post-intervention period, compared to baseline. Authors detected a significant decrease of coercive parenting practices reported by participants (Lotto et al., 2022).

Furthermore, the “Therapist-assisted Online Parenting Strategies Intervention” by Khor et al. (2022) reported after the intervention enhanced parental behaviors, self-efficacy and reduced levels of distress, considering a group of parents of adolescents affected by anxiety and depression. The value of a therapist-supported online parenting program is highlighted and recommended.

The lack of statistically significant variations from baseline to post-CiG Intervention in our sample could be referred to the fact that changes in parental behaviors and attitudes may require some time to be established and are, therefore, not immediately detectable. Tuntipuchitanon et al. (2022) described the effects of an online program promoting parenting competencies during which the parental sense of competence decreased minimally during the intervention but improved later. Longer-term follow-up may be useful to evaluate the extent to which effects are sustained over time. The assumption is in line with the considerations recently reported in literature. In their systematic review, Hansen and colleagues (2019) underline the need for future research to deeply evaluate online interventions’ longer-term effects in particular on parent efficacy, considering its crucial role for parenting. Accordingly, other web-delivered intervention studies related to parenting suggest to use a four-week follow-up period in order to be able to observe possible post-intervention changes (Holtrop et al., 2023; Shorey et al., 2017; O’Dea et al., 2020).

Parental distress significantly decreased after the intervention, especially in the PSI-total score and the P-CDI subscale. Our data agree with the existing literature described by Spencer and colleagues (2020). Perdomo and colleagues (2022) reported differences in parenting stress management after a web-based program to promote positive parenting in Spain. Considering

our results, the support provided by the host and received by the group members could have positively impacted the participants' distress levels. Experiencing shared emotions and understanding from others facing the same parenting challenges could have contributed considerably to reducing the amount of stress perceived. The host's invitation to pay more attention to positive and enjoyable times with their children may have played a role in encouraging more harmonious everyday interactions. Identifying other program-level moderators involved in the treatment process can improve the future development and delivery of online-delivered programs. More recently, Xie and colleagues reported decreased levels of maternal distress after attending online group therapy and app-based mental health and parenting program (BEAM) for mothers of infants aging from 6 to 17 months (Xie et al., 2023); ease of use, satisfaction and usefulness of the intervention were pointed out by participants, overcoming potential barriers to accessing care.

*Children's emotional regulation.* Contrary to our expectations, we detected no significant variations in parental perceptions of their offspring's emotional regulation after the CiG. Studies on online programs targeting children's emotional regulation are scarce, despite the widely recognized evidence that parents' early emotional socialization experiences are related to toddlers' social-emotional competencies. Our intervention actively supports parents' observational skills and ability to connect to children's emotional experiences to better understand their behaviors. However, our data does not align with that already available (Brophy-Herb et al., 2021). Future studies should focus on integrating innovative tools to improve emotion-regulation strategies in parents using online programs (David, Capris & Jarda, 2017).

*Social support and semi-structured phone interviews.* The levels of social support appeared to have significantly increased following the CiG, evident from the self-report questionnaires and the semi-structured phone interviews. The ability of group-based parenting to reach many families at once and its built-in social support make it an interesting resource for use during early childhood (Sampaio et al., 2018). As reported by participants, the online setting presented an opportunity to be in touch with other parents, despite the COVID-19 pandemic. The group setting was crucial to allow parents to meet with peers and broaden their awareness and parenting knowledge. This is critical considering the recent COVID-19 pandemic; several studies in Italy evaluated parents' stress levels, showing how parental mental health was severely and adversely affected (Montirosso et al., 2021). There is an urgent need to develop interventions for parents and children and to adapt services to emergency conditions using new technologies, such as online meetings and videos (Fontanesi et al., 2020).

When the intervention was finalized, and after the start of the COVID-19 pandemic, access to mental health centers was limited, representing a significant concern for parents. The CiG could

be an alternative method to access health services that is feasible and easy to use. Most of the programs delivered online described in the literature in Italy are aimed at parents of children with special needs or supporting parenting in challenging circumstances related to clinical health concerns (Rathore et al., 2022; Kenworthy et al., 2022). More research is needed to evaluate international online resources aimed at public health (Nguyen et al., 2021). Web-based parenting programs may embrace a community approach to support everyday parenting (Sanders & Kirby, 2012). As with other interventions, the online nature of the intervention encouraged participants' involvement (Cook et al., 2021; Lotto et al., 2022). Online delivery of interventions can increase participation rates, decrease barriers, and encourage participation, as shown by the parents in the post-CiG intervention interviews.

## 5. Limits and conclusions

Research on programs delivered online in a community setting remains limited. Clinical services would benefit from evidence-based guidelines about delivering them effectively (Payne et al., 2020) and overcoming well-known limitations (Hansen et al., 2019). Limitations that characterize the programs delivered online at the intervention-specific level include their suitability and accessibility, and at the level of the individuals (Liverpool et al., 2020), these can be a reluctance to share personal experiences, being too busy to engage, or unfavorable environmental conditions. Inconsistent participation is a significant limitation that must be considered. More work is needed to frame engagement strategies that support parental participation during early childhood.

Furthermore, even if CiG intervention grounded in Bowlby's Attachment Theory, potential changes in participants' attachment style and their children have not been taken into account. Considering future assessment, it would be of interest to monitor possible changes in attachment bonds before and after attending CiG, through the use of specific measures.

In conclusion, the CiG intervention constitutes a promising tool that aims to support parent-infant relationships and parental sensitivity from early infancy from a public health community approach. However, the limited group size cannot support definitive conclusions from our observations. A larger sample size and the introduction of a paired control group could overcome these limitations and help to specify more definitive conclusions. Our findings confirm the potential value of online-delivered interventions targeting parenting during infancy, as outlined previously (MacKinnon et al., 2022). Online programs are important resources to address unmet parental mental health needs, which may be particularly widespread following the COVID-19 pandemic. They represent a valuable and accessible alternative to traditional face-to-face interventions that target parental well-being.

**Ethical approval**

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board of LUMSA University (protocol code CERS07052020 approved on 14 May 2020).

**Informed Consent Statement**

Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement**

The datasets generated and analysed during the current study are original and available from the corresponding author

**Conflict of interest statement**

The authors report there are no competing interests to declare.

**Author Contributions**

FB: Conceptualization, Investigation, Writing - Original Draft; BR: Formal analysis, Writing - Original Draft; DB: Methodology, Writing - Review & Editing; TGC: Writing - Review & Editing; RG: Writing - Review & Editing; VM: Investigation, Writing - Original Draft; SDS: Conceptualization, Methodology, Supervision; Writing - Review & Editing.



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