

Psychological health of mothers and siblings of children with autism spectrum disorder during COVID-19 pandemic: New evidence in Italian families

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Abstract. *Background and aim:* Psychological challenges are well recognized in families with a child with Autism Spectrum Disorder (ASD). Instead, less is known about the effects of traumatic scenarios, such as COVID-19, on the psychological health of these families. The main aim of this study was to examine the psychological health of both mothers and typically developing (TD) siblings of children with ASD during the COVID-19 pandemic. We also investigated the relationship between mothers' psychological resources and their children's psychological well-being. *Method:* The sample included 52 mothers and their children: 15 mothers with one child with ASD and at least one TD child (ASD-siblings group) and 37 mothers with one or more TD children (TD control group). The data were collected using an online platform; four standardized questionnaires (GAD-7, BDI-II, CD-RISC 25 and CBCL) were administered. *Results:* The analyses revealed more internalizing and total behavioral symptoms in the siblings of children with ASD, compared to the TD control group. Regarding the mothers, we did not find differences in depression and anxious symptoms between the two groups. However, the mothers of children with ASD showed a lower resilience than mothers of TD children. Moreover, the psychological well-being of the children was related with the mothers' anxiety in the ASD-siblings group. *Conclusions:* Overall, our data show that the COVID-19 outbreak may have been particularly challenging for siblings of children with ASD, and highlight the importance of intensifying the psychological support to these families. (www.actabiomedica.it)

Key words: autism spectrum disorder, mothers, siblings, COVID-19, psychological health

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social communication, and restricted and repetitive patterns of behavior, interests, or activities (1). These difficulties affect personal, familiar, social, educational and occupational areas of functioning (2). Approximately 1/100 children around the world are diagnosed with ASD (3), with similar percentages in Italian context (4).

As recent literature reports, the presence of a child with ASD might also have an impact on the parents' psychological health (5) and on the typically developing (TD) siblings' well-being (6).

From 2020 the Coronavirus disease (COVID-19) brought new challenges to many Italian families and, in particular, to families with children with a neurodevelopmental disorder (7). According to recent studies, the emergency measures introduced to contain the diffusion of COVID-19 (e.g. working and living in the

same environment, distance learning, quarantine, social distancing) significantly increased the distress of parents of children with ASD (8). Unexpectedly, although having a sibling with ASD may be a risk factor for mental health problems (9), no studies focused on Italian siblings during the COVID-19 pandemic.

Psychological health of parents and siblings of children with ASD before COVID-19 pandemic

Living with a child with ASD may cause problems on the health of family members (10,11). Hayes and Watson (12) found that parents of children with ASD reported higher levels of stress than parents of both TD children and children with other disabilities such as Down syndrome, cerebral palsy and Intellectual Disabilities. Some studies reported that parents of children with ASD may be more at risk for psychiatric disorders than parents of TD children (2,13,14). In particular, according to a recent meta-analysis, the percentages of depressive disorders (31%), anxiety disorders (33%) and obsessive-compulsive disorders (10%) reported in parents of ASD children were significantly higher than the estimated prevalence of these disorders in the general population (12).

Some variables seem to have a crucial role in increasing psychopathology in parents of children with ASD: poorer parental functioning (15), greater conflict with children (16), greater severity of child behavioral problems (17-20) and the application of more severe discipline regimes (21). On the contrary, resilience seems to have buffering effects on anxiety and depression in mothers of children with ASD (22). Resilience refers to the capacity to cope with stressors and to resist the harmful effects of negative events (23); it could represent a resource for mothers of children with ASD to maintain their psychological equilibrium (22). Halstead and colleagues (24) found that, in these families, the mother's resilience can moderate the relationship between the child's behavioral problems and maternal stress. Similarly, previous research showed that the parents' resilience moderated their anxiety and depression, but only in the case of a lower presence of child's behavioral problems (22).

While the experience of parents of children with ASD is well studied, only recently researchers

have focused on the TD siblings' psychological well-being (6, 25, 26). Some authors observed that siblings of children and adolescents with ASD showed more depressive symptoms than their peers (27, 28). Other studies focused on the personal attributes such as empathy and reported that having a sibling with ASD may contribute to coping and feel good about helping out (10, 29-37). Moreover, TD siblings reported that the presence of a child with ASD in their family promoted (33) the achievement of higher awareness and generally increased the acceptance of people with ASD; by contrast, their underlined some difficulties, such as responsibilities toward their family (10, 29, 33, 37, 38) and concerns about their own future and of their sibling with ASD (30, 32, 35, 36, 39). Regarding the interaction with the children with ASD, TD siblings did not judge their experiences as completely positive or negative: living with children with ASD was described as "different" with both difficulties and positive aspects. Many TD siblings reported being proud of their siblings with ASD (29, 36, 40) and expressed appreciation to their sibling relationship (34). Among negative experiences, dealing every day with their siblings' problematic behaviors was cited as a major challenge (12). Concerns about the consequences having a sibling with ASD might have on friendships and social relationships have often been reported as well (6). TD siblings often felt anger, frustration, upset and hurt during the social interaction if others were less understanding and tolerant toward children with ASD (33, 36, 38, 40). They experienced difficulties in inviting friends at home or felt unable to explain their sibling's behaviors (30, 32, 33). Many TD siblings also complained of receiving less attention from their parents (10, 31, 37, 40).

Families with children with ASD during COVID-19 pandemic

On March 11th 2020, the WHO declared SARS-COV-2 (Coronavirus or COVID-19) as pandemic (41). From March 2020, the Italian Government implemented several emergency measures, including strict limitations on movement on the whole national territory, quarantine, self-isolation and social distancing, aimed to contain the spread of COVID-19 (42).

The pandemic imposed a prolonged and unexpected interruption of school routines, daily activities, and social relations with peers; thus, children and adolescents experienced fears, worry about the future and suffered from physical and social isolation (43, 44).

It is known that the children's psychological difficulties are often associated with those of their mothers, such as depression and anxiety (27, 45). During the COVID-19 pandemic, the Italian mothers were particularly affected by these symptoms, due to the unpredictable and rapid changes in family routine and childcare arrangements that the pandemic imposed on them (45, 46). In this scenario, maternal resilience may have been a protective factor not only for the mother's health (43, 47) but also for the children's psychological health. Instead, mother's difficulties in emotional regulation and emotional awareness could be associated with internalizing and externalizing problems in their children (48).

During COVID-19 pandemic, parents that had a child with neurodevelopmental disorders and that already experienced more elevated levels of stress (49), appeared more at risk of a worsening of their psychological health status than families of TD children (50). Some studies reported more parental distress and lower quality of life in parents of children with ASD relative to families with TD children (7, 51, 52). Italian parents of children with ASD described change and restrictions following the onset of the emergency as challenging and requiring more commitment than before (53). Unexpectedly, Miniarikova and colleagues (54) found that, during the pandemic period, the prevalence of depression in a sample of mothers of children with ASD was lower than in the general population. According to the authors, a first explanation may be that the parents of children with ASD have better coping strategies, acquired through their caregiver status, that they used also during the pandemic (55). Second, it may be that the containment measures have had a positive impact (at least at the moment) on families with children with ASD, avoiding the parents to stressful situations such as moving to the sites of interventions (55). Thus, we considered it crucial to deeply investigate the psychological health of mothers and siblings of children with ASD during the COVID-19 pandemic and the relationships between them.

The current study had therefore three main purposes. First, we analyzed the psychological well-being and the resilience of mothers of children with ASD during the pandemic period. We hypothesized a high level of anxiety and depression symptoms in all the mothers of our sample, in the ASD group in particular. Regarding the resilience, we did not formulate a specific hypothesis concerning potential differences between the two groups as previous research is still scant. Second, we analyzed the psychological well-being of the TD siblings during the same period. Even though COVID-19 restrictions represented risk factors for psychological problems in all children, we expected worse conditions in these siblings relative to TD children living in families without disabilities. Third, we investigated whether mothers' psychological difficulties and resilience were related to the psychological well-being of their TD children. Since an increased vulnerability to the maternal psychological characteristics has been observed in atypical developing children relative to the TD population (47), we expected closer associations in the ASD-siblings group relative to the control group.

Method

Participants

The sample comprised 52 mothers and their children: 15 mothers with one child or adolescent with ASD and at least one TD child (ASD-siblings group) and 37 mothers with one or more TD children without disabilities (TD control group).

The decision to involve mothers rather than the fathers was based on the existing literature that observes a higher participation rate of mothers than fathers and suggests that mothers are more accurate in reporting psychological problems in their children (56, 57).

All children with ASD had a diagnosis provided before the enrollment by a neuropsychiatrist or a psychologist with high expertise in ASD and according to ICD-10 criteria (58). Seven children had a Borderline Intellectual Functioning (Intellectual Quotient between 70 and 85), eight children had an Intellectual

disability associated with the ASD (Intellectual Quotient < 70).

The mean age of the children and adolescents with ASD was 8 (SD = 3.8). They all received specific interventions (11 of them Applied Behavior Analysis -ABA-, 3 of them Psychomotor education, and 1 child Early Start Denver Model Intervention).

The mean age of the mothers of the ASD-siblings group was 41 (SD = 6.7); the mean age of the mothers of the TD control group was 40 (SD = 4.7).

The mean age of the siblings of the ASD-siblings group was 7 (SD = 3) and the group included 9 males and 6 females. The mean age of the children of the TD control group was 6 (SD = 1.9) and the group included 14 males and 23 females.

We excluded mothers with psychiatric or physical disorders, mothers with a history of recent traumatic events and with more than one child with ASD or other neurodevelopmental disorders. Among the mothers of ASD group, 8 of them participated in mutual help parent groups or family associations.

Procedure

In Italy, the COVID-19 epidemic broke out in March 2020 (first wave). On March 9, the government imposed the lockdown which lasted until May 2020 (9 March 2020 - 18 May 2020). In September 2020, there was a new wave of COVID-19 infection (second wave; 28 September 2020 - 27 December 2020). A third wave of COVID-19 lasted from January 2021 to May 2021. During the second and third wave, restrictive measures were again imposed by the government. From May 2021, a gradual easing of the restrictive measures and a return to normality started.

The data were collected in Northern Italy from March to May 2021, during the third wave of COVID-19. In that period in Italy the emergency measures were different according to the diffusion of COVID-19, even so less restrictive than those adopted during the lockdown period of 2020. In the regions with high incidence of COVID-19 (as in Northern Italy where the data were collected), teaching sometimes moved to online learning platforms; after-school educational, indoor recreational activities

and sports were forbidden, and the use of face masks was mandatory.

The mothers included in the ASD-siblings group were recruited in private and public centers for the diagnosis and rehabilitation of ASD. The mothers of TD children were recruited from schools. An online survey was administered to all mothers. The survey was anonymous, and data confidentiality was assured. In the first section of the survey, participants responded to some general questions concerning socio-demographic characteristics including age, education, and employment, as well as some questions investigating psychological and health-related variables (presence of psychological disorder/physical disease, psychological supports). In the second section, the questions focused on children with both ASD and TD and concerned age, education, presence of psychological disorders and supports.

In the last section, mothers were asked to respond to the Italian version of the following scales: 7-item Generalized Anxiety Disorder Scale (GAD-7; 59), Beck Depression Inventory II (BDI-II; 60, 61) and Connor-Davidson Resilience Scale (CD-RISC 25; 62), thinking about themselves; thinking about their TD child, the mothers filled in the Child Behavior Checklist (CBCL; 63, 64, 65). The survey took about 30 min to be completed. All participants provided electronic informed consent that contained information about the purpose of the study, procedure, benefits of participating, voluntary participation, and contact information of the researchers.

The study met ethical guidelines for human subject protections, including adherence to the legal requirements of the country (Declaration of Helsinki), and it received formal approval by the local research Ethical Committee of the University of Modena and Reggio Emilia.

Standardized measures

Generalized Anxiety Disorder Scale (GAD-7; 59). The GAD-7 is one of the most widely used measures of Generalized Anxiety Disorder (GAD) symptoms, in both clinical practice and research due to its diagnostic reliability and efficiency (66). GAD-7 can be

applied for screening and assessment of anxiety disorders, as well as for social phobia, Post-Traumatic Stress Disorder (PTSD) and panic disorders. The GAD-7 includes seven items based on seven core symptoms and inquires the frequency with which respondents suffered from these symptoms within the last two weeks. Respondents report their symptoms using a 4-item Likert rating scale ranging from 0 (not at all) to 3 (almost every day), such that the total score ranges from 0 to 21. The total score may be categorized into four anxiety degrees: normal (0-4), mild (5-9), moderate (10-14) and severe (15-21) anxiety. The GAD-7 is a well-validated screening instrument, and it has demonstrated excellent internal consistency (Cronbach's alpha = 0.911)

Beck Depression Inventory II (BDI-II; 60, 61). The BDI-II is a widely used self-report inventory that evaluates the symptoms of depression in adolescents and adults. It consists of 21 items that investigate the presence and the severity of depression. Individuals are asked to respond to each question based on a two-week time. The total score ranges from 0 to 63 and may be divided into four degrees: normal (0-13), mild (14-19), moderate (20-29) and severe (30-63) depression. The Italian version of the BDI-II is comparable to the original edition with a Cronbach Alpha of 0.86 for the mental factors and a Cronbach alpha of 0.65 for the somatic factors.

Connor-Davidson Resilience Scale (CD-RISC 25; 62). The CD-RISC 25 is a self-report scale used to quantify resilience in both general population and clinical samples. The CD-RISC 25 contains 25 items, all of which carries a 5-point range of responses, as follows: not true at all (0), rarely true (1), sometimes true (2), often true (3), and true nearly all of the time (4). In line with the "3 Cs" theoretical model of psychological resilience (e.g., Reich, 2006), the items concern control (e.g., "I believe I can achieve my goals, even if there are obstacles"), coherence (e.g., "Good or bad, I believe that most things happen for a reason") and connectedness (e.g., "I have at least one close and secure relationship that helps me when I am stressed"). The scale is rated based on how the subject has felt over the past month. The total score ranges from 0-100, with higher scores reflecting greater resilience. The CD-RISC 25 has been tested in the general population, as well as in

clinical samples, and demonstrates sound psychometric properties, with good internal consistency (0.90).

Child Behavior Checklist (CBCL; 63, 64, 65). The CBCL is a standardized measure of emotional, social and behavioral problems in children and adolescents. It includes: the Parent Report Form (PRF); the Teacher Report Form (TRF); and the Youth Self-Report (YSR). In the present study we only used the PRF. This consists of 113 items that describe whether the child/adolescent is currently exhibiting, or has exhibited within the past 6 months, specific emotional and behavioral problems. It is completed by the parents using a 3-item Likert rating scale ranging from 0 (not true) to 2 (very or often true). Eight sub-scales can be derived here, as: anxious/depressed, withdrawn/depression, somatic complaints, social problems, thought problems, attention problems, rule-breaking behavior, and aggressive behavior. The CBCL provides three summary scores: Total Score, Internalizing score (anxious/depressed + withdrawal/depression + somatic complaint subscale scores) and Externalizing score (rule-breaking behavior + aggressive behavior subscale scores). The CBCL demonstrates good psychometric properties; test-retest reliability was reported to range from .80 to .94, and internal consistency was generally reported to be high given that scales were derived via factor analysis techniques (63).

Data analysis

All statistical analyses were carried out using SPSS 23.0 for Windows, with an alpha level of 0.05. Prior to conducting analyses, the data were checked for violation of assumptions of normality and homogeneity of variance using Kolmogorov-Smirnov and Levene tests, respectively.

With regard to the first and second goal, as some variables were not normally distributed, Mann Whitney tests were conducted to assess potential differences between the mothers and the children of the ASD-siblings group and TD control group.

Spearman's correlations were performed to analyze the relationships between mothers' psychological difficulties and resilience and mental health of their children.

Results

Psychological well-being and resilience in mothers of children with ASD

No significant differences emerged between the two groups in the GAD-7 total score (see Table 1). In order to test the presence of Generalized Anxiety Disorders in the mothers, a descriptive analysis of the number of mothers with normal, mild, moderate and severe anxiety was conducted. The percentages are presented in Table 2.

The Mann Whitney test brought out no significant differences between the two groups of mothers in the BDI-II questionnaire (see Table 1). The percentages of mothers with normal, mild, moderate and severe depression were reported in Table 2.

With regard to resilience, significant differences emerged between the two groups of mothers, with a lower level of resilience in the mothers of children with ASD, compared to mothers of the control group (see Table 1).

Behavioral problems in the ASD-siblings group compared with TD control group

The Mann Whitney test revealed significant differences in the CBCL total score and in the CBCL Internalizing score. Specifically, compared to the TD control group, the siblings of children with ASD showed more behavioral problems and internalizing symptoms (see Table 3). There was no significant difference between the two groups in the CBCL Externalizing score (Table 3).

Relationships between mothers' psychological problems and resilience and children's mental health

In the ASD-siblings group, we found that CBCL total score was significantly related to GAD-7 total score and to BDI-II total score (see Table 4). Significant correlations between CBCL Internalizing score and GAD-7 total score were also found (Table 4).

In the TD control group, no significant correlations were found between children's behavioral problems (CBCL) and mothers' psychological well-being (GAD-7 and BDI-II).

In both groups, the mothers' resilience (CD-RISC 25) did not significantly correlate with the children's psychological symptoms (CBCL) (see Table 4).

Discussion

The current study examined the psychological condition of Italian mothers and TD siblings of children with ASD during the COVID-19 pandemic period. We conducted the study more than a year after the start of the pandemic to understand whether the long pandemic period negatively impacted on the mental health of these families. A focus on siblings was important, as the literature appeared still scarce and inconclusive. Furthermore, for the first time in this study, the relationship between mothers' psychological condition and siblings' mental health was investigated.

Concerning the mothers, we found no difference between the ASD group and mothers of the control group in anxiety and depression symptoms. However, it is important to notice that many mothers with and

Table 1. Descriptive data for the Generalized Anxiety Disorder Scale (GAD-7), Beck Depression Inventory II (BDI-II), and Connor-Davidson Resilience Scale (CD-RISC 25), and results of the statistical comparisons (Mann-Whitney tests).

Variables	ASD-siblings group (n=15)	TD control group (n=37)	Mann-Whitney	
	Mean (SD)	Mean (SD)	U	p
GAD-7	8.80 (4.04)	6.86 (5.18)	187.00	.067
BDI-II	8.47 (5.28)	7.81 (5.39)	256.50	.670
CD-RISC 25	50.6 (16.73)	64.65 (10.02)	152.00	.011

Significant results are in bold.

Table 2. Percentages of mothers for degree of anxiety (GAD-7) and depression (BDI-II).

	GAD-7 (%)				BDI-II (%)			
	Normal (0-4)	Mild (5-9)	Moderate (10-14)	Severe (15-21)	Normal (0-13)	Mild (14-19)	Moderate (21-29)	Severe (30-63)
ASD-siblings group (n=15)	13.33	46.66	26.66	13.33	80	20	0	0
TD control group (n=37)	45.94	27.02	16.21	10.81	81.08	16.22	2.7	0

Table 3. Descriptive data for the Child Behavioral Checklist scores (CBCL) and results of the statistical comparisons (Mann–Whitney tests).

		ASD-siblings group (n=15)	TD control group (n=37)	Mann–Whitney	
Variables		Mean (SD)	Mean (SD)	U	p
CBCL	Internalizing score	8.33 (7.33)	2.94 (2.99)	161.00	.018
	Externalizing score	7.27 (5.57)	5.21 (3.69)	224.5	.282
	Total score	29.9 (24.32)	13.2 (8.4)	151.00	.011

Significant results are in bold.

Table 4. Spearman's correlations (rs) between mothers' and siblings' variables in ASD-siblings group and TD control group.

		ASD-siblings group (n=15)			TD control group (n=37)		
		GAD-7	BDI-II	CD-RISC 25	GAD-7	BDI-II	CD-RISC 25
		rs	rs	Rs	rs	rs	rs
CBCL	Internalizing score	.795**	.304	.342	.128	.137	-.017
	Externalizing score	.293	.160	.297	.144	.087	-.103
	Total score	.812**	.527*	.203	.097	.107	-.188

*p < .05; **p < .01. Abbreviations: GAD-7: Generalized Anxiety Disorder Scale; BDI-II: Beck Depression Inventory; CD-RISC 25: Connor-Davidson Resilience Scale; CBCL: Child Behavior Checklist).

without a child with ASD reported anxious symptoms that fall in a clinical range (mild to severe), with higher percentages in the group of mothers of children with ASD. Thus, our findings partially contrast with data collected during the lockdown (first wave of the year 2020) in Italian families of children with neurodevelopmental disorders (7, 67). These studies indicated a stronger impact of COVID-19 pandemic on the attitude, anxiety and mental status of parents of children with ASD. In particular, the anxiety in parents of children with ASD during COVID-19 lockdown was described as significantly higher as compared to the status of anxiety before COVID-19 (68).

Unexpectedly, we also found no differences between the two groups of mothers in the level of depression. These results differ from other studies that found a higher association between anxiety and depression in mothers of children with ASD compared to mothers of TD children (69). A possible explanation of these conflicting findings may depend on the period in which data were collected. We conducted this study during the third wave of COVID-19; thus, it is possible to suppose that the prolongation of the pandemic may have worsened the psychological health of the mothers in general, also of those of the control group. As some authors reported (7, 46, 70), already during the COVID-19

lockdown mothers of TD children experienced an increase of internalizing symptoms and a high level of stress and concerns, caused by the reduced social and educational support, disruption of regular routines, and by difficulties to balance work and children caring (7). It should also be considered that most previous studies investigated the psychological condition of mothers and fathers together, and this could have strongly influenced the results. Added value of our study was focusing only on the mothers of these children and adolescents.

With regard to maternal resilience, we found that the mothers of children with ASD reported lower scores at the CD-RISC 25 than the mothers of TD children. This result is partially in line with the study conducted in the pre-COVID period by Bitsika and colleagues (22) on mothers of children with ASD; however, the mean resilience value of those mothers (i.e., mean score = 67.04) appears much higher than the mean value found in our sample. Moreover, the CD-RISC 25 scores of our mothers of the ASD group appear lower than those reported, during COVID-19 lockdown, by mothers of children with other neurodevelopmental disorders, such as Specific Learning Disabilities - SLD (47). In addition, going to compare the mean CD-RISC 25 score of our mothers of the ASD group with that of the study of Wang and colleagues (68) conducted during COVID-19 pandemic, our mean score was much lower. The mean CD-RISC 25 score reported by Wang and colleagues (68) in the ASD group was similar to the mean value that we found in our control group. Instead, the mothers of our ASD group reported a mean CD-RISC 25 score very close to the score reported by patients with PTSD (62). Thus, our findings appear relevant if considering resilience as a protective factor for both the maternal mental health and psychological well-being of the entire family (24, 46). Previous research found that resilience is influenced by several circumstances including social and economic factors and family stress (5,70). Thus, we can speculate that during this pandemic the Italian mothers of children with ASD experienced prolonged levels of distress that heavily affected coping strategies. It is also possible that the resilience of these mothers was already highly "stressed" before the COVID-19

pandemic and that, as the situation continued, this psychological resource "run out".

Clearer data seemed to emerge with regard to the siblings of children with ASD. In fact, they clearly showed greater emotional and behavioral problems than the control group. These results appear in line with some studies conducted in the pre-COVID period (28). Even though the total number of symptoms did not fall within the clinical range, compared to the TD control group, the siblings of the children with ASD showed more difficulties in the domain of internalizing symptoms. Recently, Koukouriki and colleagues (27) examined depressive symptoms in a sample of Greek siblings of children with ASD. The authors found that the siblings scored higher in a test evaluating depression symptoms, relative to the control group. According to our data, it seems that being a sibling of a child with ASD could represent an important risk factor for the sibling's psychological well-being, probably even more during stressful times such as the COVID-19 pandemic. Certainly, the pandemic period has impacted on all children, as previous research has reported (44), suggesting a worsening of both internalizing and externalizing symptoms. However, the Italian siblings of children with ASD seem to have greatly suffered from the pandemic period that has just ended.

The present study has also highlighted very close relationships between mothers' anxiety and depression symptoms and siblings' psychological problems in the ASD-siblings group. The association between parental anxiety and child's psychopathological symptoms, such as anxiety and depression, has been widely demonstrated in the general population (71). Recently, a study by Koukouriki and Soulis (27) on Greek families found similar associations also in families of children with ASD. Thus, our findings provide new evidence of these important relationships. Interestingly, in our study these relationships concern only the ASD group. In line with what shown in other clinical populations (46), this finding seems to suggest an increased susceptibility to the maternal characteristics and resources in children living in "atypical" conditions, such as siblings of children with ASD. For many vulnerable children that already live difficult situations, there is the

possibility of further psychological problems wherever parents are very stressed and unsupportive from an emotional point of view.

Limitations

Although the present research offers interesting evidence, some limitations need to be mentioned. First, the sample size is small, therefore the generalizability of our findings should be carefully considered. Although the specific focus on Italian mothers and siblings of children with ASD during COVID-19 pandemic represents an added value to our work, further studies need to be conducted with larger samples to generalize our results. The limited sample size may also have impacted the ability to detect some differences between the two groups and relationships between mothers' resilience and children's psychological well-being. More in-depth analyses should be conducted to understand, for example, whether maternal resilience has an indirect relationship, mediated by other psychological variables, with children's mental health. Second, data from this study are limited to a single time point. Interesting goal could be to replicate this study in the present period, after three years of pandemic, to understand how the psychological condition of mothers and children has changed. Finally, we did not consider in the analyses some socio-demographic and personal characteristics that could have influenced the results (e.g., economic status, perceived social support, levels of severity of the ASD). From the literature, mixed results concerning the relationship between socio-economic status (SES) and psychological problems in mothers of children with ASD emerge. Some authors reported that lower-income and low educational background seem to be predictors of maternal emotional problems in families with a child with ASD (72); other studies found that high education and income decreased the stress in the whole family (73). By contrast, Zhou and colleagues (74) reported that only one component of the SES, the junior high school education level, was a protective factor for depressive symptoms in mothers of children with ASD. Future research should therefore

include socio-demographic and economic variables for controlling their potential effect on results.

Implications

Our data reveal that the psychological harm resulting from the pandemic to Italian families with children or adolescents with ASD is important. These results expand the research concerning the psychological difficulties of families of children with ASD, especially of the TD siblings, and highlight the importance of intensifying the psychological support during traumatic events such as COVID-19 pandemic. For the siblings, welfare system, educational services and psychologists should take particular care of them proposing specific interventions. Welfare systems and psychologists should also assist the mothers of children with ASD, promoting resilience in intervention programs. Improving their psychological status and supporting them in their coping with mental health issues might prevent negative effects on the psychological well-being of their children, being the siblings' mental health closely related to that of the mothers.

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