

The impact of COVID-19 on families: Children's mental  
health and the role of stress parents experience  
Thesis

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### Abstract

**Background.** At the start of 2020 COVID-19 has spread all over the world. In the Netherlands, societal measurements were taken to stop the disease from spreading. Previous research showed that the impact of pandemics can influence the mental health of children. There are also indications that the experienced stress of parents elevates during this pandemic. Moreover, this stress can influence the mental health of children. The current study focuses on the question ‘Is the impact of the COVID-19 pandemic related to the mental health (i.e., internalizing and externalizing behaviours) of 1-to-6-year-old children, and does the stress parents experience play a role?’ **Method.** An online questionnaire was distributed to collect data. A total of 1328 parents participated. Two did not complete the questionnaire. Therefore, data of 1326 parents were analysed. **Results.** Results showed that the experienced negative impact of the COVID-19 pandemic was positively associated with the internalizing and externalizing behaviours of 1-to-6-year-old children. In addition, higher levels of experienced negative impact were associated with higher levels of stress in parents. Moreover, the experienced stress of parents was positively associated with the internalizing and externalizing behaviours of children. Results showed an indirect effect between the experienced negative impact and the internalizing and externalizing behaviours of children, with the experienced stress of parents as mediator. **Discussion.** This study showed that there is an association between the impact of the COVID-19 pandemic and the mental health of 1-to-6-year-old children. Moreover, the stress parents experience plays a mediating role in this association. Limitations and implications are discussed.

*Keywords:* COVID-19 pandemic, young children, internalizing behaviours, externalizing behaviours, experienced stress of parents

## **The impact of COVID-19 on families: Children's mental health and the role of stress parents experience**

In December 2019, the first patients with the Coronavirus (COVID-19) were identified in Wuhan, China. In a short period of time, individuals all over the world were diagnosed with COVID-19 and it became a global pandemic. All over the world, including in the Netherlands, societal measurements, like quarantines and lockdowns, are taken to prevent the virus from spreading (Meier et al., 2020). These measurements have an impact on family lives due to disruptions in social, cultural, and religious areas, and financial hardship (Griffith, 2021). Research during and after previous pandemic outbreaks can provide information about the impact of a pandemic. For example, studies into the SARS-CoV outbreak in 2003 and the MERS outbreak in 2015 show that posttraumatic stress and depressive behaviour were elevated among Chinese adults (Lui et al., 2012; Lee et al., 2018).

There are also some first indications that during the COVID-19 pandemic, the mental health of people is declining. The meta-analysis of Salari et al. (2020) showed that the prevalence of stress, anxiety, and depression among the general population in Asia, the UK, Spain, Italy, and Nigeria has increased due to the pandemic. In addition, there are first indications that the pandemic has an impact on children's mental health from studies conducted in China and the United States. In China, results from two studies showed that the COVID-19 pandemic has had a significant impact on the psychosocial wellbeing (Duan et al., 2020). Boys and girls aged 3-18 years old showed elevated levels of clinginess, distraction, irritability, and fear (Jiao et al., 2020). Similarly, parents in the US reported that the mental health of one out of seven children under the age of 18 has worsened since the start of the pandemic (Patrick et al., 2020).

Most research regarding COVID-19 has been done in Asia or the US. Little is known about the Dutch population. Moreover, populations samples included mostly adults and children under 18 years old. There are no studies specifically about the mental health of 1-to-6-year old children. The current study is the first to investigate the impact of the COVID-19 pandemic on the mental health of these young children in the Dutch context. It is also the first study to investigate the role of stress experienced by parents during the COVID-19 pandemic. Understanding the reactions of the children and factors that influence these reactions is essential to address the needs of these children during and after the pandemic.

### **The impact of COVID-19 on children's mental health**

The first aim of this study is to investigate the impact of the COVID-19 pandemic on the mental health of 1-to-6-year-old children. In the current study, the impact of the COVID-

19 pandemic is indicated by the experiences of parents due to the pandemic. For example, isolation and quarantine, financial hardship, stigmatization, and discrimination, working from home, tension between parents and/or children, less social support, disruption of routines, but also more quality time, stronger religious beliefs and more contact with family and friends. In addition, two indicators of children's mental health will be studied. First, internalizing behaviours, which concerns the extent to which children experience anxiety and depression. Second, externalizing behaviours, which concerns the extent to which children experience irritability and anger (Wicks-Nelson & Isreal, 2016).

In a review of Hamiel et al. (2017) it becomes clear that exposure to traumatic events can have great impact on the mental health of preschool children. Emotion regulation plays an important role in dealing with these events and the mental health of children (Haselgruber et al., 2020). Emotion regulation is defined as the process of influencing and expressing the experienced emotion (Gross, 1998). However, children start to develop adaptive emotion regulation around the age of six (Spanjaard & Slot, 2015). Due to underdeveloped emotion regulation, children under the age of six are not equipped to handle negative experiences adequately (De Young et al., 2011). This makes them more emotionally vulnerable than older children (Cohen et al., 2006; Wolmer et al., 2017).

The degree of impact of a disaster seems to influence the mental health of children. Research into the mental health of children during the SARS-CoV pandemic in 2003 and the Swine Flu pandemic in 2009 indicated that children who were isolated and quarantined experienced more PTSD and mental health issues than other children (Sprang & Silman, 2013). Moreover, children who lost a loved one during a pandemic experienced more severe mental health issues than children who did not lose someone (Earls et al., 2008). There is also some preliminary evidence of the impact of the COVID-19 pandemic on the mental health of young children. Jiao et al. (2020) state that during the COVID-19 pandemic, children between the three- and six-years old show more clinginess and fear than older children. They also state that children living in higher infected areas in China experience more anxiety and irritability than children living in less infected areas. Moreover, in a cross-sectional study among parents in Bangladesh, factors that influenced the mental health of children were relatives infected with COVID-19, parents who still need to go to the workplace during the pandemic, and the worry that parents can lose their jobs because of the pandemic (Yeasmin et al., 2020).

### **The role of stress of parents**

The second aim of the study is to investigate role of the experienced stress of parents, which has been defined as the by parents perceived inability of handling the challenges

experienced in a situation (Straus, 1980). During the COVID-19 pandemic, parents experience bigger challenges and perceive lower ability of handling these challenges due to a variety of factors, for example unemployment, financial hardship, low social support, and a lack of leisure time (Griffith, 2021). In addition, Fontanesi et al. (2020) state that parents can worry about financial difficulties, their own physical health and that of their children, their children's well-being, social isolations, home schooling, and more. Another study conducted in the US shows a relationship between COVID-19-related stressors and the stress levels of parents (Brown et al., 2020). These stressors included parents' physical health, children's physical health, maintaining relationships, and children's academic performances.

Past studies have also shown the influence of various factors on stress among parents (Lindström et al., 2011; Parkes et al., 2015; Sorkkila & Aunola, 2020). In a study among Swedish parents with children with Type 1 diabetes, parents perceived more stress when they had low social support, financial distress, and lack of leisure time (Lindström et al., 2011). Moreover, in a study among Finnish parents, risk factors for stress among parents were unemployment and a poor financial situation (Sorkkila & Aunola, 2020). Finally, in a Scottish study, mothers experienced high levels of stress when they experienced low social support (Parkes et al., 2015).

In short, it can be expected that the mental health issues of both children and parents are higher in families that experiences a relatively larger impact of the COVID-19 pandemic. In addition, an indirect can be expected, in which the stress experienced by the parents has an influence on the mental health of children. Carpenter & Stacks (2009) state that toddlers and pre-schoolers depend greatly on their parents in regulating their emotions. The regulation systems of young children are not fully developed yet and therefore they need their parents to guide them in regulating their emotions and behaviours. According to the Window of Tolerance Theory, the stress parents experience affects their ability to be (emotional) available as a buffer for their children (Siegel, 1999). The Window of Tolerance refers to a zone of arousal within which a person can function effectively. In other words, the parent can help the child regulate their emotions. However, when a parent experiences too much stress, they can cross the boundaries of their window, in which case the parents cannot support their child in their emotion regulation.

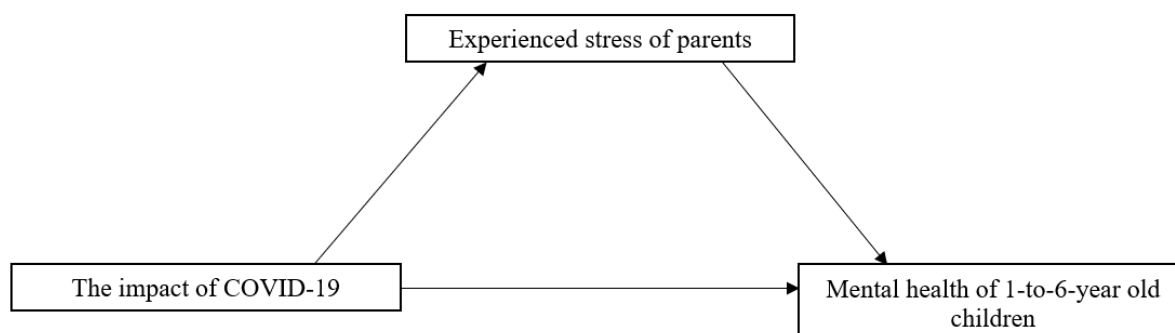
Different studies have investigated the role of stress experienced by parents on the mental health of children (Davis & Carter, 2008; Zerk et al., 2009; Crum & Moreland, 2017). In a study among parents of autistic toddlers, the stress parents experience was related with internalizing and externalizing behaviour of toddlers (Davis & Carter, 2008). Moreover, in the

study of Zerk et al. (2009), stress among parents was a strong predictor for internalizing and externalizing behaviour of pre-schoolers. In addition, in a study among children between the two- and six-year-old stress among parents was a predictor for anxiety, withdrawal, anger, and aggression in children (Crum & Moreland, 2017).

The role of stress that parents experience has also been investigated during pandemic outbreaks. During the SARS-CoV outbreak of 2003 parents that experienced emotional difficulties and stress showed lower levels of emotional availability toward their children (Koller et al., 2010). Moreover, a first study examining the role of stress among parents during the COVID-19 pandemic, showed that the children with parents who experiences relatively higher levels of stress showed more mental health issues, like aggression and anxiety, than children with parents who experienced lower levels of stress (Russel et al., 2020).

### **The current study**

To summarize, previous research shows first indications of the impact of the COVID-19 pandemic on the mental health of children and on the stress parents experience. Moreover, although an often-overlooked age-group, there are reasons to believe 1-to-6-year-old children might be especially vulnerable, because they rely greatly on their parents. However, the stress a parent can experience hinders in the emotional availability of the parent, which can have an effect on the mental health of their children. Therefore, the current study will focus on the mental health of 1-to-6-year-old children in the Netherlands. The overall purpose is to provide insight into mental health of young children during the COVID-19 pandemic and the role of stress parents experience. The first aim is to examine whether the impact of the COVID-19 pandemic is associated with mental health problems of 1-to-6-year-old children. Mental health will be conceptualized in two ways: internalizing behaviours (i.e., anxiety and depression) and externalizing behaviours (i.e., irritability and anger). The second aim is to examine the role of stress parents experience (See Figure 1 for an overview of the research question). Based on the literature four hypotheses were formulated: (1) children will show relatively higher levels of internalizing and externalizing behaviours when the reported impact of the COVID-19 pandemic is higher; (2) parents will show relatively higher levels of stress when the reported impact of the COVID-19 pandemic is higher; (3) children will show relatively higher levels of internalizing and externalizing behaviours when parents experience more stress; and (4) the stress parents experience will mediate between the impact of the COVID-19 pandemic and the mental health of children.



**Figure 1.** Schematic Representation of the Current Study

## Method

### Participants

Participants in this study were parents living in the Netherlands with at least one child between the age of one and six years old. Parents were recruited via social media (Facebook, Instagram, LinkedIn) and different institutions like primary schools, day-care centres, magazines, and organizations specifically for parents (e.g., *Nederlands Jeugd Instituut*). A link to the online survey was distributed through these channels as well.

In total of 1328 parents ( $M_{age} = 34.5$ ,  $SD_{age} = 4.01$ ) have completed the questionnaire. Of these parents, 1290 participants were mothers (97.1%  $M_{age} = 34.39$ ,  $SD_{age} = 3.97$ ), 35 participants were fathers (2.6%,  $M_{age} = 37.54$ ,  $SD_{age} = 4.35$ ), and three participants (0.2%) did not state their gender. The children of these participants had an age-mean of  $M = 4.07$ . Of these children, 639 were girls (48.1%), 685 were boys (51.6%), and four parents (0.3%) did not state the gender of their child.

Two participants did not have the complete data relevant for this study. Therefore, those two participants were excluded. A total of 1326 participants were included in the study.

### Procedure

The current study was part of a larger international study on the impact of the COVID-19 pandemic on 1-to-6-year-old children and their families. The study was approved by the ethical committee of the University of Utrecht (study code 20-0498). Data was collected by distributing an online questionnaire. The questionnaire was developed in Australia and translated in Dutch, by a team of three researchers. The translated questionnaire was constructed in Qualtrics by four master students. One parent per family could participate. At the start of the questionnaire, participants were informed about the purpose of the study and their privacy. They were informed that their participation was voluntarily and that they could stop at any moment during the questionnaire if they did not want to participate anymore. Finally, informed consent was asked. The questionnaire consisted of eight parts. For the

current study, part of the data was used (e.g., ‘impact of the COVID-19 pandemic on family life’, DASS-21, and PROMIS-EC).

### **Measuring instruments**

**The impact of the COVID-19 pandemic.** To measure the impact of the COVID-19 pandemic a new questionnaire was developed for the current project. The questionnaire consisted of 24 items about possibly experienced consequences of the pandemic on family life. The items represented consequences in basic needs, relations, life events (i.e., birthdays), domestic violence and social support, and financial, cultural and religious consequences. Participants reported to what extent they had experienced the different consequences, using a 5-point Likert scale (1 = *not at all* and 5 = *very much*). Sixteen items asked about experienced negative consequences of the pandemic (e.g., “Our family has experienced financial hardship from the COVID-19 pandemic”). Eight items were about experienced positive consequences (e.g., “Increased closeness amongst family members”). The scores on the positive items were recoded and all 24 items were used to calculate an average score ranging between one and five. A relatively low score indicated that parents did not experience any impact of the pandemic on family life, and relatively high score indicated that parents experienced great impact of the pandemic on family life. The scale score is on interval level.

Because this is a newly developed instrument, no information on the validity and reliability is available yet. In the current study, the reliability is high,  $\alpha = .82$ .

**Experienced stress of parents.** To measure the stress parents experience, participants completed the Dutch version of the Depression Anxiety Stress Scale – 21 (DASS-21) (Henry & Crawford, 2005). This questionnaire is divided in three subscales: depression, anxiety, and stress. In the current study, the stress-subscale was used, which assessed the extent to which parents experienced stress during the last seven days. The stress-scale consisted of seven items (e.g., “I found it hard to wind down”, “I found it difficult to relax”). Participants could answer on a 4-point Likert scale (1 = *does not apply to me at all* and 4 = *applied to me very much, or most of the time*). The mean score of the seven items was used to measure the experienced level of stress of parents. The range was between one and four, with a relatively low score indicating that the parent experienced low levels of stress, and a relatively high score indicating that the parent experienced high levels of stress. The scale score was on an interval level.

Prior research has shown a good validity for the DASS-21 among Dutch adults (Wardenaar et al., 2018). In the current study, the reliability was high,  $\alpha = .90$ .



**Mental health of 1-to-6-year-old children.** Participants reported on their child's mental health using the Patient-Reported Outcomes Measurement Information System-Early Childhood (PROMIS-EC) (Blackwell et al., 2020). For the current study, two scales were created; an (a) internalizing behaviours scale, averaging 24 items combining the depression (9 items, e.g., "My child seemed sad") and anxiety scales (15 items, e.g., "My child seemed nervous") and an (b) externalizing behaviours scale, averaging 16 items that assess irritability/anger (e.g., "My child had a tantrum in public"). Participants had to answer about their child's behaviour over the past seven days on a 5-point Likert scale (1 = *never* and 5 = *always*). The mean score for both scales ranged between one and five, with a relatively low score indicating that the child showed low levels of internalizing/externalizing behaviours, and a relatively high score indicating that the child showed high levels of internalizing/externalizing behaviours. The scale scores are on interval level.

Prior research has shown a good validity for the PROMIS-EC (Blackwell et al., 2020), but there is no research done yet in a Dutch population. In the current study, the reliability of the internalizing and externalizing behaviours scales was high, respectively  $\alpha = .93$  and  $\alpha = .94$ .

### **Plan of analyses**

To examine whether the impact of the COVID-19 pandemic was related to the mental health of 1-to-6-year-old children, and whether stress experienced by parents mediated this association, two regression models were conducted. The first model had internalizing behaviour of 1-to-6-year-old children as outcome measure and the second model had externalizing behaviour of 1-to-6-year-old children as outcome measure. Both models had 'the impact of the COVID-19 pandemic' as independent variable and 'experienced stress by parents' as mediator.

Before the regression analyses were performed, the assumptions were checked. First, to check the data for outliers, boxplots were created. Second, to check if the relationships between the independent variable, the mediator and the outcome measures were linear, scatterplots were created. Third, to check if the residues of the variables were normally distributed, histograms were created. Fourth, for the multicollinearity-assumption, VIF-values were used. Fifth, for the homoscedasticity-assumption, scatterplots of the variables' residues were created. Sixth, to check if the variables were normally distributed, the Shapiro-Wilk test was used and histograms were created. After checking the assumptions, descriptive statistics and correlations were analysed. Finally, the regression analyses were performed. To perform all the different analyses, the IBM SPSS Statistics software, version 26 (SPSS) was used. To

perform the regression analyses, with the experienced stress by parents as mediator, the PROCESS tool (Preacher & Hayes, 2008) within SPSS was used.

## Results

### Assumptions, descriptive statistics, and correlations

Before conducting the regression analyses, relevant assumptions were checked (Field, 2013). The results showed that most assumptions, but not all, were not violated. First, for the assumption of linearity between the variables, scatterplots were created. Results showed that all variables had a linear relationship with one another. Second, for the assumption of normally distributed residues, histograms were created. Results showed normally distributed residues. Third, for the assumption of multicollinearity, the VIF-values of the variables ‘impact of COVID-19 pandemic’ and ‘experienced stress of parents’ were calculated. Both VIF-values were 1.44. Finally, for the assumption of homoscedasticity, scatterplots of het variables residues were created. Results showed no violations.

Some assumptions were violated. First, the participants were not selected at random. A convenient sample was used (Neuman, 2014). In addition, there were a total of 59 outliers on all variables ( $SD > 1.5$ ). Of these 59, six were identified as outliers on multiple variables. The variable ‘impact of COVID-19 pandemic’ had 14 outliers, ‘experienced stress by parents’ had 15 outliers, ‘internalizing behaviours’ had 19 outliers, and ‘externalizing behaviours’ had 11 outliers. The outliers were kept in the data. Finally, not all variables were normally distributed. Results of the Shapiro-Wilk test not one variable was normally distributed; ‘Impact of COVID-19 pandemic’,  $W = .98, p < .01$ , ‘internalizing behaviours’,  $W = .82, p < .01$ , ‘externalizing behaviours’,  $W = .95, p < .01$ , and ‘experienced stress of parents’,  $W = .92, p < .01$ . However, the Shapiro-Wilk test can be oversensitive for relatively large sample sizes (Tabachnick & Fidell, 2007). Therefore, histograms were also created. The histograms showed that the variable ‘Impact of COVID-19 pandemic’ was normally distributed, but the other three variables were not. The results showed right-skewness for ‘internalizing behaviours’, ‘externalizing behaviours’, and ‘experienced stress of parents’, which means that parents reported relatively more low levels of experienced stress issues and low levels of behavioural issues in their children.

To summarize, some assumptions were violated, but there were enough participants to overlook these violations (Neuman, 2014).

The descriptive statistics of and correlations between the study variables are displayed in Table 1. Correlations between the study variables were all significant and in the expected direction. Parents who reported relatively higher impact of the COVID-19 pandemic also

reported higher levels of internalizing and externalizing behaviours of their children, and higher levels of experienced stress. In addition, parents reported higher levels of internalizing and externalizing behaviours of their children when they reported higher levels of experienced stress. Finally, when parents reported relatively high levels of internalizing behaviours of their children, they reported also high levels of externalizing behaviours.

**Table 1.** *Correlations between and Descriptive Statistics of all Study Variables (N = 1326).*

	1	2	3	4	M	SD	Range
1. Impact of COVID-19 on family life	1	.55*	.45*	.44*	2.49	0.48	1.29 - 4.29
2. Experienced stress by parents		1	.42*	.44*	1.73	0.60	1.00 – 4.00
3. Internalizing behaviours			1	.62*	1.44	0.46	1.00 - 4.29
4. Externalizing behaviours				1	1.95	0.63	1.00 - 4.88

\* $p < .01$

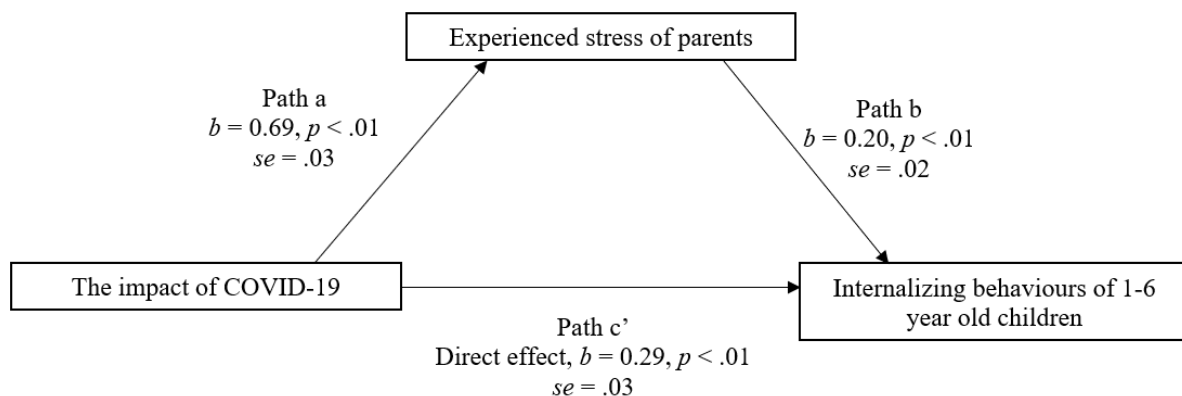
### **The impact of COVID-19 and internalizing and externalizing behaviours**

The first aim of this study was to investigate the association between the impact of the COVID-19 pandemic and the mental health of 1-to-6-year-old children. Results of two regression analyses showed that the impact of the COVID-19 pandemic, reported by parents, was significantly related to internalizing behaviours ( $b = 0.43$ ,  $SE = .02$ ,  $p < .01$ ) as well as externalizing behaviours of children ( $b = 0.58$ ,  $SE = .03$ ,  $p < 0.1$ ). The overall fit of both models was  $R^2 = .20$ ,  $p < .01$ . These results indicate that when parents reported a higher level of experienced impact, children showed relatively higher levels of internalizing and externalizing behaviours.

### **The impact of COVID-19, experienced stress of parents, and internalizing behaviours**

The second aim of the current study was to investigate the role of the stress parents experience in the association between the impact of the pandemic and the mental health of 1-to-6-year-old children. Mental health was conceptualized in two ways: internalizing behaviours and externalizing behaviours. Figure 2 shows the results of the regression analysis

with internalizing behaviours as outcome variable. The overall fit of the model was  $R^2 = .24$ ,  $p < .01$ . First, the results showed that parents experienced relatively higher levels of stress when they reported a relatively higher impact of the pandemic. Second, results showed that parents who experienced relatively higher levels of stress, reported higher levels of internalizing behaviours of their children. Third, parents reported relatively higher levels of internalizing behaviours of their children when they experienced a higher impact of the pandemic. Finally, there was a significant indirect effect,  $b = 0.13$ , CI [0.10, 0.17], indicating that the stress parents experience plays a mediating role within the association between the impact of the COVID-19 pandemic and internalizing behaviours of 1-to-6-year-old children. This means that when the reported impact of COVID-19 on family life is higher, parents experience higher levels of stress, which in turn is associated with higher levels of internalizing behaviours of children.

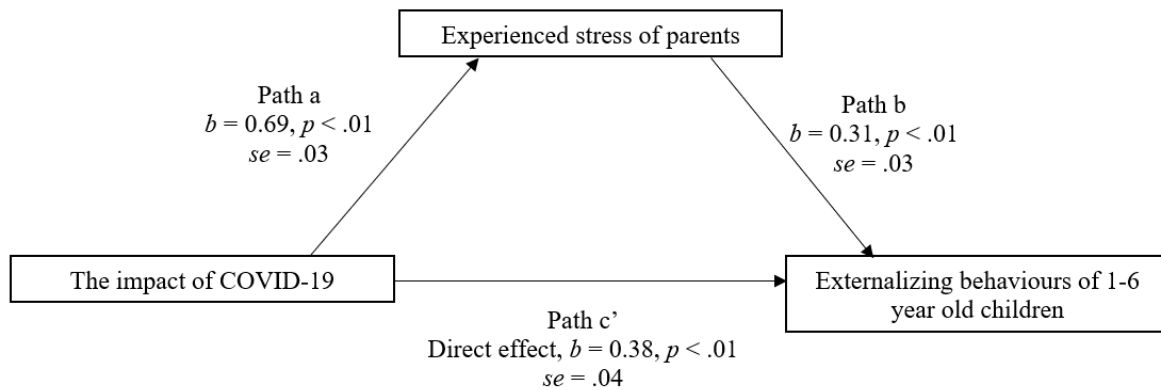


**Figure 2.** Results Regression Analysis with Internalizing Behaviours as Dependent Variable.

### The impact of COVID-19, experienced stress of parents, and externalizing behaviours

Figure 3 shows the results of the regression analysis with externalizing behaviours as outcome variable. The overall fit of this model was  $R^2 = .25$ ,  $p < .01$ . First, the results showed that parents experienced relatively higher levels of stress when they reported a relatively higher impact of the pandemic. Second, results showed that parents who experienced relatively higher levels of stress, reported higher levels of externalizing behaviours of their children. Third, parents reported relatively higher levels of externalizing behaviours of their children when they experienced a higher impact of the pandemic. Finally, there was a significant indirect effect,  $b = 0.21$ , CI [0.16, 0.26], indicating that the stress parents experience plays a mediating role within the association between the impact of the COVID-19 pandemic and externalizing behaviours of 1-to-6-year-old children. This means that when the

reported impact of COVID-19 on family life is higher, parents experience higher levels of stress, which in turn is associated with higher levels of externalizing behaviours of children.



**Figure 3.** Results Regression Analysis with Externalizing Behaviours as Dependent Variable.

### Discussion

There were first indications of the impact of the pandemic on the mental health of children and on the stress parents experience (Brown et al., 2020; Duan et al., 2020; Fontanesi et al., 2020; Jiao et al., 2020; Patrick et al., 2020; Salari et al., 2020; Griffith, 2021). Most research has been done in Asia and the US among adults and children under the age of 18. Little was known about the impact of the COVID-19 pandemic on the Dutch populations and on 1-to-6-year-old children specifically. Therefore, the overall purpose of the current study was to investigate the experienced impact of the COVID-19 pandemic by Dutch parents on the mental health of their 1-to-6-year-old children (i.e., internalizing behaviours and externalizing behaviours) and the role of the stress parents experience.

The first aim was to investigate the association between the impact of the COVID-19 pandemic and the mental health of 1-to-6-year-old children. As expected, the results showed that Dutch children between the ages of one and six showed relatively higher levels of internalizing and externalizing behaviours when parents experienced a relatively high level of impact of the pandemic. These results are in line with previous research which indicated higher levels of mental health issues in children who experienced higher impact of previous pandemics (e.g., SARS-CoV pandemic in 2003 and Swine Flu pandemic in 2009) (Earls et al., 2008; Sprang & Silman, 2013). The results are also in line with previous research about the COVID-19 pandemic in Asia and the US indicating mental health issues in children (Jiao et al., 2020; Patrick et al., 2020). These results increase the knowledge about the experienced impact of parents of the COVID-19 pandemic and the mental health of 1-to-6-year-old children. The emotion regulation of these young children is still underdeveloped and they are

not equipped to handle negative experiences adequately (De Young et al., 2011; Spanjaard & Slot, 2015). Therefore, the impact parents experience due to the COVID-19 pandemic, like unemployment, financial hardship, home-schooling and low social support, is associated with the mental health of these young children.

The second aim of the study was to investigate the role of stress parents experience. The results confirmed the hypotheses and showed that stress experienced by parents partially mediated the association between the impact of the COVID-19 pandemic and both internalizing and externalizing behaviours of children. Results showed that parents experienced higher levels of stress when they experienced relatively more impact of the COVID-19 pandemic. Parents perceive that they are not able to cope with the challenges they face during the pandemic. As a result, they experience relatively more stress. Next, results showed that parents reported higher levels of internalizing and externalizing behaviours of their children when they experienced higher levels of stress. One possible explanation is that, as a consequence of the experienced stress, parents feel that they cannot meet the needs of their children in regulating their emotions, as the Window of Tolerance Theory states (Siegel, 1999). The results are in line with previous research indicating that the experienced stress by parents is associated with children's mental health (Davis & Carter, 2008; Zerk et al., 2009; Crum & Moreland, 2017). This study adds to the empirical research indicating that during the COVID-19 pandemic children experience more mental health issues when parents experience more stress (Russel et al., 2020).

There are several strengths and limitations in this study. A strength of the study is the big sample of 1326 participants. This means that results can be generalized. However, the sample population consisted mostly out of mothers born in the Netherlands. Therefore, the results can only be applied to 1-to-6-year-old Dutch children and their native Dutch mothers. It is important for future research to include fathers and immigrant families. The role of fathers in parent-child interactions often differs from mothers (Lamb, 2010). Fathers are often a playmate for their children, while mothers have a more nurturing role. Consequently, fathers can have different views towards their child's behaviour. This can affect the results of the current study. Regarding immigrant families, several studies suggest that there are cultural differences between Dutch native families and migrant families (Vollebergh et al., 2005; Yaman et al., 2010). Not only parenting characteristics are different (Yaman et al., 2010), but immigrant children also show more problem behaviour than native Dutch children (Vollebergh et al., 2005). Another limitation is the cross-sectional nature of the study. Therefore, it is difficult to indicate causal relationships. It is possible that children already had

behavioural issues before the pandemic and not because of the pandemic. It is also difficult to determine long-term trends. Following the parents for a longer time can determine long-term trends.

This study has important practical implications. Results showed that the experienced impact of the COVID-19 pandemic has a direct and indirect association with the mental health of 1-to-6-year-old children, with stress experienced by parents as mediating factor. It is important that these children and their parents are supported during the COVID-19 pandemic. The *Nederlands Jeugdinstituut* already has a site, where parents and childcare professionals can find helpful information (NJI, n.d.).

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### **Appendix A: Data-collection**

To fulfill the data collection hours, I have performed several activities. I have created a flyer to distribute on social media to recruit participants and together with fellow students, we created a recruitment pitch that went with the flyer. Moreover, Facebook and Instagram accounts were created for the study. We also put the translated questionnaire in Qualtrics so it could be distributed. In addition, we put the English version in Qualtrics as well. This way people living in the Netherlands who do not master the Dutch language yet could also fill out the questionnaire. Once this preparation work was done, many different institutions (e.g., GGD's, day-care centers, primary schools, libraries, institutions like the NJI) were contacted with the question if they wanted to share our questionnaire on social media, in newsletters, and other resources. I also contacted my own social network to recruit participants and asked if they wanted to share the questionnaire with their social network.