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Maternal mental health, mother-baby interaction and digital media use[1]

Saúde mental materna, interação mãe-bebê e o uso de mídias digitais

Salud mental materna, interacción madre-bebé y uso de medios digitales

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ABSTRACT
The relationships between mother-baby interaction and digital media use by mother-child pairs in which the mothers had symptoms of common mental disorders were investigated in a multiple-case study. Four mother-baby dyads participated. The following instruments were applied: Sociodemographic and Media Use Questionnaire, Interview on Family Interaction with the Use of Technologies, the Self-Reporting Questionnaire, and an assessment of dyadic interaction. The results showed that the use of screens provided relief from the mothers' emotional suffering. Also, the more mothers were available in the interaction, the less children sought digital media. However, all cases showed maternal hostility levels.

KEYWORDS:
Mother child relations; Mental health; Technology; Telecommunications media; Childhood

RESUMO
As relações entre a interação mãe-bebê e uso de mídia digital por pares mãe-filho, em mães apresentavam sintomas para transtornos mentais comuns, foram investigadas em um estudo de casos múltiplos, com quatro díades mãe-bebê. Aplicou-se o Questionário Sociodemográfico e de Uso de Mídia, a Entrevista sobre Interação Familiar com o Uso de Tecnologias, o *Self-Reporting Questionnaire* e avaliação da interação. Os resultados mostraram que o uso de telas proporcionou alívio do sofrimento emocional das mães. Além disso, quanto mais mães estavam disponíveis na interação, menos as crianças buscavam as telas. No entanto, todos os casos mostraram níveis de hostilidade materna.

PALAVRAS-CHAVE:
Relação mãe-criança; Saúde mental; Tecnologia; Meios de telecomunicação; Infância

RESUMEN
Este trabajo trata de un estudio de casos múltiples que investigó las relaciones entre la interacción madre-hijo y el uso de medios digitales, en madres que presentaban síntomas de trastornos mentales comunes. Se aplicaron il Cuestionario Sociodemográfico y de Uso de los Medios, Entrevista sobre Uso de Tecnologías, el *Self-Reporting Questionnaire* y evaluación de la interacción. Los resultados mostraron que el uso de medios digitales aliviaba la angustia emocional de las madres. Cuanto más disponibles estaban las madres en la interacción, menos buscaban los niños los medios digitales. Sin embargo, en todos los casos se observaron niveles de hostilidad materna.

PALABRAS CLAVE:
Relación madre-niño; Salud mental; Tecnología; Medios de telecomunicación; Infancia.

Maternal mental health is considered a determining factor of the quality of mother–baby interaction (Alvarenga et al., 2018). Maternal mental health can have an impact on child development, such as the appearance of behavioral changes and child emotional negativity (Prenoveau et al., 2017). In the context of maternal mental health problems, the arrival of the child can cause the emergence of signs that can reduce the mother's quality of life and well-being, which can make attachment and bonding with the child difficult (Carvalho & Benincasa, 2019).

Mothers with depressive and anxious symptoms tend to exhibit intrusive behaviors that can hinder their child's autonomy (Hakanen et al., 2019). Still, for Hakanen et al. (2019), maternal depression 6 months after the child's birth was a predictor of less maternal structure in the mother–child interactions. Nevertheless, a recent study highlighted that, even in the presence of anxiety and depression, the greater the mother's sensitivity and affectivity, the greater the child's engagement in the interaction (Dib et al., 2019). In addition, children of mothers with mental health problems can invite their mothers to interactive exchanges or even maintain the same level of quality of interaction as the children of mothers who do not have depressive or anxious symptoms (Dib et al., 2019).

The demands imposed by motherhood can lead mothers to resort to some means to soften this process. Currently, digital media has been increasingly used by families with young children. Recent data from a Brazilian survey indicated that 63.3% of children between 24 and 42 months spent more than an hour a day connected to some type of media (Nobre et al., 2019). This increasing use can be seen in the light of the theory that mothers find in screens an aid to their routines, whose use allows them to carry out their personal and domestic tasks (Mallmann & Frizzo, 2019). However, pediatric societies are consistent in discouraging the use of digital media until toddlerhood (American Academy of Pediatrics, 2016; Sociedade Brasileira de Pediatria, 2019) because there might be negative impacts on infant development at this critical stage.

Some studies have devoted themselves to investigating such impacts on the mother–baby relationship from this growing use of media in early childhood. McDaniel and Radesky (2018a) found that parents' use of mobile devices during daily routines with their children may reflect difficulties in the relationship. In addition, their involvement with the child tends to be less responsive after a moment of using digital media (Hiniker et al., 2015). In the same

direction, Wolfers et al. (2020) suggested that the duration of mothers' use of screens can impact their sensitivity to interaction with their children.

In the context of maternal mental health problems, the use of digital media seems to take on different shapes. The maternal use of a smartphone makes the depressed mother less responsive to her child and, as a result, further weakens the already fragile dyadic relationship (McDaniel & Coyne, 2016). In this sense, McDaniel and Radesky (2018a) evaluated depressive symptoms in mothers and fathers and the phenomenon known as *technointerference*, which concerns the interference of technology in interpersonal interactions. Although the problematic use of technologies and the parents' depression did not correlate, the interference of technology in parenting was related to both. Coyne et al. (2020) investigated the use of technologies and prenatal depression, which was linked to greater technointerference. Finally, a study investigated some protective factors for delayed child development at 2 years of age in the presence of maternal mental health risks. According to the results, limiting the use of screens to less than an hour a day could decrease possible delays in children's development (McDonald et al., 2016).

Despite acknowledging that mothers are fundamental agents in toddlers' exposure to digital media, there is still no consensus on the mechanisms of its use in mother–baby relationships by mothers who manifest mental health problems. Therefore, this study aimed to investigate the relationship between mother-baby interaction and digital media use in infants of mothers with symptoms of common mental disorders.

Method

Participants

Participants were integrants of a major project that aimed to investigate how digital media have been used in families with children up to 3 years old and how this has influenced child development (Frizzo et al., 2017). The project started following 465 mothers all over Brazil through an online survey. Mothers from this sample living in Porto Alegre or metropolitan region were invited to go to the university for the next data collection phase, which involved a qualitative interview and to be filmed interacting with their child. Thirty-four of them agreed to go to the university's lab for the next phase.

Table 1

Participants' Sociodemographic Data

	Participants			
Mother and Child (Case)	Adriana & Alice (Case 1)	Bruna & Bernardo (Case 2)	Cláudia & Camila (Case 3)	Débora & Daniel (Case 4)
Age	34	37	23	29
Maternal Education	Postgraduation	Postgraduation	College	Graduation
Mother's Marital Status	Married	Married	Lived Together	Single
SRQ-20 Ratings	13	10	19	16
Toddler's Gender	Female	Male	Female	Male
Toddler's Age	22 months	24 months	14 months	22 months

The inclusion criteria for participation in the project were being the biological mother and, for the toddler, being healthy and up to 36 months old. As exclusion criteria, the following were considered: (1) regarding *the toddlers*: malformations, neurological problems, genetic syndromes, and/or other severe clinical issues detected upon parental report; (2) regarding *the mothers*: the presence of intellectual disability and/or other identified severe psychopathological issues according to the observation from the contact with the mother.

For the selection of the cases, maternal ratings were evaluated with the Self-Reporting Questionnaire (SRQ-20) instrument, considering 8 as a cutoff point for symptoms of common mental disorders (CMD) (Mari & Williams, 1986). Although seven out of the 34 mothers met the inclusion criteria (cutoff point greater than 8), the four mothers with the highest scores were selected based on the exhaust sampling criteria (Fontanella et al., 2008). This study also follows the recommendation that case studies should be dedicated to four cases to allow depth of analysis (Creswell, 2014).

As highlighted in Table 1, the participating mothers were aged between 23 and 37 and declared themselves to be White. Moreover, all of them declared themselves to be heterosexual and lived in the capital of a state in Rio Grande do Sul. Toddlers' age ranged from 14 to 24 months; two were male, and two were female.

Procedures and Measures

This is qualitative research with an exploratory character, in which a multiple-case study design was used (Yin, 2015). This design allows the researcher to thoroughly investigate a phenomenon, considering the similarities and distinctions within a specific group of people (Stake, 2006).

About the procedures, an online survey with the "Questionnaire on Sociodemographic Data" (NUFABE, 2017a) and the "Questionnaire on the Use of Media" (NUFABE, 2017b) was carried out in the bigger project, which invited mothers of children up to 36 months to answer questions about the use of digital media with their toddlers, their own mental health, and their child's development. At the end of that survey, there was an invitation for mothers from Porto Alegre or its metropolitan region who were interested in continuing their participation to attend together with their children a research laboratory of the Psychology Institute of the university. When they arrived, they signed the Informed Consent Form upon agreement. Afterward, mothers were asked to participate in a parent–child interaction session, which was filmed. In the end, we carried out the "Interview on Family Interaction with the Use of Technologies" (NUFABE, 2017c).

Instruments and Measures

Sociodemographic Data Questionnaire (NUFABE, 2017a)

This instrument collects sociodemographic data from the participants and their families, such as age, schooling, marital status, housing, income, and other conditions.

Questionnaire on the Use of Media (NUFABE, 2017b)

Adapted version to Brazilian Portuguese and authorized by the North American team of the questionnaire used in the survey*: "Zero to Eight: Children's Media Use in America 2013*" (Rideout, 2017). This questionnaire collects information about digital items that families have at home, which media are used by children and their parents, as well as the time and frequency of this use.

Interview on Family Interaction with the Use of Technologies (NUFABE, 2017c)

It aims to explore what adults think about digital media, how and in what context they use them with their children, and what they classify as the advantages and disadvantages of using those gadgets with children.

Maternal Mental Health

We used the Self-Reporting Questionnaire (SRQ-20) to assess mothers' mental health. The SRQ-20 is a psychiatric screening instrument for non-psychotic mental disorders, mainly for symptoms of depression and anxiety, that is, common mental disorders (Beusenberg et al., 1994). The questionnaire consists of 20 yes/no questions. Each affirmative answer is classified as "1," and the result is given by a total score, with 8 being the cutoff point that is widely used (Barreto do Carmo et al., 2017; Mari & Williams, 1986). The Brazilian version was validated by Mari and Williams (1986) and reassessed by Gonçalves et al. (2008). The internal consistency of the Brazilian version was 0.86 (Gonçalves et al., 2008). The instrument was used in this research to obtain a measure of maternal mental health.

Mother-Child Interaction

We included two different instruments to analyze the mother–child interaction. The tasks of mother–infant interaction were based on the Kia-Profil (Stern et al., 1989), and the coding of the mother–child behavior was based on the *Dyadic Interaction Assessment Protocol* (Piccinini, et al., 2007, which is based on Ainsworth et al., 1978; Cox, 1998). A quantitative and qualitative evaluation of the interaction between adult and child was carried out, lasting approximately 25 minutes. The dyad performed the following interactive sequence: (1) playing without objects; (2) playing with toys; (3) playing with smartphone—mother–child pair is asked to play with the device; (4) teaching; (5) ignoring—task in which the mother was asked to ignore the child while using the smartphone; (6) separation—the mother leaves the room for

a few moments; (7) meeting again—the mother returns to the room. Maternal behavior during each task was coded in the following categories: (a) sensitivity— ability to perceive and infer the meaning behind the child''s behavioral signals, and to respond to them promptly and appropriately, (b) structuring— ability to structure the situation and the child's behavior, aiming for a successful interaction, (c) level of intrusiveness— ability to interact with the child in their space, pace, rhythm and level of involvement, and (d) level of hostility— ability to interact with the child revealing positive emotions in the interaction without showing hostility or aggression towards the child. The following categories were analyzed in the child's behavior: (a) responsiveness— the level of satisfaction of the child in the interaction with the adult, and (b) involvement— the child's level of participation in the interaction with the caregiver. Two judges (the first and second authors of this paper) watched all the episodes independently and coded the behaviors separately on a 5-point Likert scale. This scale ranges from 1 (nonexistent) to 5 (excellent). Scores of 2 and 4 always indicate poor and good, respectively. Score 3, in the maternal categories of sensitivity and structuring, refers to inconsistent, in intrusiveness refers to slightly intrusive, and in hostility refers to implicitly hostile. In all other categories, a 3 indicates moderate. After the coding, the judges discussed eventual discrepancies between scores, seeking consensus. Then, the average of each category in all episodes was calculated to assess the quality of the global interaction of the dyad in each category. In quantitative analysis, the higher the score, the better the performance in the evaluated aspect.

Ethical Considerations

The project from which this study is derived follows human research recommendations. It was approved by the University's Ethics Committee under opinion nº. 69947117.6.0000.5334. To reinforce confidentiality, data protection, and identity, this research used pseudonyms and omitted some information that could facilitate the identification of participants, such as their names (Creswell & Poth, 2018).

Data Analysis

For data analysis, the *SRQ-20*, the *Sociodemographic Data Questionnaire*, and the *Questionnaire on the Use of Media* were used descriptively to characterize the participants. Then, the *Interview on Family Interaction with the Use of Technologies* was transcribed, read thoroughly, and analyzed with the aid of NVivo Qualitative Data Analysis Software (NVIVO) version 12 (QSR, 2018).

The mother–child interaction was assessed quantitatively and qualitatively, according to the scores obtained in the coding (Piccinini et al., 2007). It was used to enable triangulation between the two sources (interview and video recording), considered one of the main validity strategies in qualitative research (Creswell & Poth, 2018).

After collecting the data, two thematic axes were constructed: (1) Ways of Using Digital Media and (2) Digital Media as a Resource. Afterward, the crossed cases were synthesized to compare them in terms of their similarities (Yin, 2015).

Results and Discussion

In this part, the four cases will be presented individually. After that, the synthesis of cross cases will be performed.

Case 1 — Adriana and Alice

Adriana was 34 years old, considered herself White, and was Alice's mother. She had an administration degree and wasn't working at the time of the study. She was married and lived with her daughter's father, and the family's annual income was approximately $26,400. Alice was 22 months old and wasn't attending a daycare center in the data collection period.

Regarding the use of digital media, the mother felt the need to offer them to Alice when she was studying. She offered TV for her daughter to watch, especially in the morning when she was more energetic: "I use TV more in the early morning, which is when she has a lot of energy."

To diminish motherhood's distresses, the mother reported that technology served to provide moments of self-care. She stated that in this way, she remembered who she was before Alice was born:

> I, a recent mother, know that it is very hard, a lot to do, there is a whole adaptation. When … you can deliver the baby to someone, in quotes—that would be the tablet—it is the moment that you are back as if you were alone; then you can take a bath, have a coffee, eat, in a little while read a book, call someone. So, it's that moment when you can do other activities than just the baby, so for the mother, it's a relief, so I have this feeling that for the one hour I hand her over to the tablet or DVD, I can get back to being who I am.

In this dyad, the media also contributed to the toddler's engagement with her mother. Adriana pointed out that Alice would try to get her attention by making verbal sounds when the video she was watching had finished: "She can already tell me when the DVD ends, so she picks up the letters, and she says 'han, han,' like, and then, will it continue now, or what will happen?" This aspect was also transposed to the interaction. In the "ignoring" episode of the

interaction evaluation, Alice constantly tried to attract her mother's attention through physical and verbal contact. Adriana, on the other hand, ignored her daughter's attempts. In contrast, it is intriguing that the girl scored low on levels of involvement and responsiveness in the mother–child interaction evaluation, as shown in Table 2. Thus, one hypothesis is that the use of maternal media enabled Alice to attempt to get closer to her mother. Another plausible aspect is that the mother's relative intrusiveness, combined with the suffering shown above, could hinder the daughter's initiative through contact and the tuning of the dyad. Because of this, the appearance of another object, such as the smartphone, would be necessary for the child to find space to seek maternal care.

Case 2 — Bruna and Bernardo

Bruna was 37 years old, declared herself White, and was Bernardo's mother. She worked as a health professional, had a graduate degree, and was on work leave. She was married to her son's father, and the family's annual income was approximately $26,400. At the time of research, Bernardo was 24 months old and wasn't attending a daycare center.

Bruna reported that she used digital media to distract Bernardo, especially in everyday moments such as at mealtimes: "At dinnertime, he is already in a sleepy time, it is a critical hour, and it's a time in which I have more difficulty in entertaining him with the things he saw during the whole day". Still, the use of technologies softened the demands of the process of becoming a mother:

> It's much easier for us to get and give the tablet: "it's here, take it, my problem is over." I think it's very easy for parents to do that. It's not easy taking care of him for 24 hours. It's very hard.

Nonetheless, she said she felt guilty for offering a digital resource to her son: “I had nothing on the trip, no space for him, and I had to use the TV … because I didn’t have anything else to entertain him. Without having an extra resource like that, I felt quite guilty”.

Bruna’s narrative also showed that when she was talking on her smartphone, her son imitated her as a way of interacting: “Someone calls me, sometimes I put the phone on speaker, and I talk to the person, and he is ‘papapa’ a way for him to interact too.” Meantime, another report suggested that the maternal use of the screens created a reaction of displeasure in the child. In response to that, the child tried to win back his mother’s attention through physical contact: “He doesn’t like [social networks], he comes after me and keeps poking me … he is like, ‘Mom, I’m here, Mom, I want attention’.”

In this case, it was intriguing that the mother had the highest score for hostility, yet the son scored well on involvement and responsiveness. In the transition from the episode “playing with toys” to “playing with a smartphone” in the interaction evaluation, Bernardo cried copiously. He was furious at the removal of the toys and the insertion of the smartphone. At the same time, Bruna laughed at her son’s lack of control and just said, “you should be angry against her [the researcher], it wasn’t me who took your toys.” In the continuation of the scene, the boy tried to approach his mother, leaning his arms on her leg to hold him, and in response, Bruna took Bernardo’s arm away from her in a negative way without any eye contact. The toddler only managed to calm down when the mother put a video with music on the smartphone. At that moment, lowering his head towards the screen, Bernardo fixed his gaze on his smartphone and watched the video with full concentration.

Case 3 — Cláudia and Camila

Cláudia was 23 years old, considered herself White, and was Camila's mother. She worked as an administrative assistant and was studying to complete higher education. She lived with her daughter's father and with their two other children aged 11 and 14. The family's annual income was approximately $5,280. At the time of data collection, Camila was 14 months old and attended a daycare center.

Cláudia felt a greater need to offer digital media to Camila when working or studying at home and receiving visitors. However, she used these digital media to provide an interaction between the pair, as she realized that Camila liked to take selfies with her smartphone and used this moment to communicate with her: "She really likes to take pictures, so we take pictures and show her. The baby takes a selfie, she presses there, takes it, then we ask her "who is this baby here?" and she claps her hands".

Despite this, for Cláudia, the use of digital media with her daughter helped her to face the demands imposed by raising a child: "[The use of technologies] is comfortable for the parents, quite comfortable … she [the daughter] stays amused with that thing."

Camila also resorted to using the media as her own resource. In the "ignoring" episode of the interaction evaluation, she exhibited behaviors of exploring objects, moved around the room, expressed positive attitudes such as by smiling, and made verbal sounds. Still, it is noteworthy that although Camila had moderate responsiveness and involvement ratings in the interaction evaluation, Cláudia scored the highest on intrusiveness.

Case 4 — Débora and Daniel

Débora was 29 years old, declared herself White, and was Daniel's mother. She had higher education, worked as a chemist, and earned about $5,280 per year. Débora was single, lived only with her son, and did not mention anything about Daniel's contact with his father. At the time of the research, Daniel was 22 months old and was attending a daycare center.

Débora felt a greater need to offer digital media to Daniel when she was working at home, and when she received visits. However, she reported that she perceived that digital media did not catch Daniel's attention very much: "[the smartphone] is not something that captures him for a long time". She also perceived her son as more relaxed without using any digital media, so she avoided using them: "I don't need to use anything [digital media], he stays fine. Sometimes he doesn't ask, sometimes he asks [to use digital media], but it's not necessary. During meals is actually the other way round, if I don't have anything connected, he [his behavior] even stays better that way". Also, she was the only one who mentioned using the radio because she noticed that Daniel liked to dance and used the moment to dance together: "I use the radio for him to listen to music, he likes to dance, I dance with him, he likes it". In line with these data, in the interaction assessment, Débora was the only one who showed good levels of structuring, which means she encouraged and supported Daniel`s autonomy during the activities. And Daniel, in turn, showed good responsiveness and involvement, demonstrating he was happy and well engaged to his mother during the interaction.

Synthesis of Cross Cases

Given the cases presented above, similar aspects were noted among them concerning the relationship between maternal mental health, the quality of mother–baby interaction, and the use of digital media between the dyads. In Table 2, it is possible to see the general evaluation of the mother–baby interaction in the four cases. Then, the cases will be detailed

according to the analyzed axes: (1) Ways of Using Digital Media and (2) Digital Media as a Resource.

Table 2

Mother–Child Interaction Evaluation

		Case 1	Case 2	Case 3	Case 4
Mother	Sensitivity	Weak	Inconsistent	Inconsistent	Inconsistent
	Structuring	Weak	Inconsistent	Inconsistent	Good
	Intrusiveness	Relatively Intrusive	Slightly Intrusive	Intrusive	Slightly Intrusive
	Hostility	Eventually Hostile	Hostile	Implicitly Hostile	Implicitly Hostile
Child	Responsiveness	Weak	Good	Moderate	Good
	Involvement	Weak	Good	Moderate	Good

Axis 1 — Ways of Using Digital Media

Axis 1, Ways of Using Digital Media, details how the mothers reported using technologies with their children. Although all four mothers reported using digital resources with their children in their daily routine, there was a similarity in the use in Cases 1, 2, and 3. These mothers stated that they offered the media to their Toddlers to calm them down, distract them, or entertain them. This use of technologies does not seem to encourage interaction, which can negatively impact the mother–baby relationship (Radesky et al., 2015) and the child's development (Antar, 2019).

It was noted that Cláudia and Débora, the mothers in Cases 3 and 4, mentioned that they used digital media to promote interactive exchanges with their children, for example, when taking selfies and dancing together, respectively. Accordingly, it is interesting that these same mothers had the two highest SRQ-20 scores for maternal mental health problems. Both

showed inconsistent sensitivity and implicit hostility throughout the interaction evaluation. Despite this, in general, Camila scored moderately on responsiveness and involvement, while Daniel scored well on responsiveness and involvement. Dib et al. (2019) pointed out that mothers who assume a more affective and stimulating behavior also had children with greater involvement in the interaction. One might think that for Cláudia (Case 3) and Débora (Case 4), the use of digital media would support them to demonstrate more creative behaviors, which would potentially encourage their children to engage in interactions.

In this sense, in these two pairs, the use of media aimed to contribute to the mother–child interaction, seeming to favor their bond when carrying out an activity together with this resource and not using it centrally. This is in line with the American Academy of Pediatrics (Council on Communications and Media et al., 2016), which proposes that the adult's interaction with the child while using media is essential. Besides, it can also enrich the parent-child bond (Nikken, 2017). However, according to McDonald et al. (2016), in the context of postpartum depression, paying attention to the decrease in screen time can protect the child from possible developmental delays. In such a way, one may think that the moderate and good ratings of responsiveness and involvement of the two children in the mother–child interaction in this study were able to contribute to the more interactive mode of media use. Different studies corroborate this hypothesis by showing that children of mothers with symptoms of depression and anxiety invite their mothers to interact or maintain the same level of quality of interaction compared to children of mothers who do not have these symptoms (Dib et al., 2019). Nevertheless, the severity and chronicity of maternal symptoms were not evaluated in the present study.

Adriana (Case 1) and Bruna (Case 2) were the mothers who reported allowing their toddlers to use media alone. However, it is intriguing that, among the participants, these mothers were the ones who scored lowest on the SRQ-20. Furthermore, they registered, respectively, weak, and inconsistent sensitivity and structuring. Compared to the other two mothers, they both scored the highest on hostility, and this was also observed qualitatively during the mother–child interaction. It is known that hostility can be present in mothers who have emotional disorders, causing negative impacts on child development (Janßen et al., 2019). It is necessary to consider whether these mothers tend to leave their children alone with screens more to minimize hostile behaviors, echoing other difficulties in the relationship. Despite this, it is noted that all cases in this research revealed some level of hostility throughout the interaction, unlike other previous studies that evaluated the dyad interaction in different contexts, such as in the manifestation of child psychofunctional symptoms in children and marital adjustment (Peruchi et al., 2016) and maternal depression and child psychofunctional symptoms (Silva et al., 2018).

Thus, in this axis, it was identified that even in the presence of maternal mental health problems, two mothers made more creative use of media, which means that they provided greater interaction with their children. This might be due to the good maternal structure. The other two mothers did not report using media to provide a moment of interaction with their children. In this sense, higher hostility seems to be an essential component among these cases. The question is if maternal mental health problems would increase this hostility, or if not being able to play with the children would potentiate hostile behaviors in the interaction.

Axis 2 — Digital Media as a Resource

Axis 2, Digital Media as a Resource, shows the reasons the mothers reported the use of digital media and their crossings in dyadic interaction. Among the cases, all interviewees mentioned that they could carry out domestic chores or other pending activities while their children were using digital media. This result has already been found in mothers without mental health problems, pointing out that the use of digital media with children allow caregivers to accomplish their chores more easily (Mallmann & Frizzo, 2019).

In the presence of maternal mental health symptoms, the arrival of a child can be even more challenging for the mother, impacting her mental, physiological, and social health (Carvalho & Benincasa, 2019). Thus, it is possible to conjecture that digital media use would support mothers and compensate for the demands of the child-rearing process for the participants in this research. Nevertheless, research has revealed that mothers who experience numerous stressors related to raising children tend to resort to using their digital devices to escape stress (McDaniel & Radesky, 2018b). Regarding motherhood and psychological factors, Dau et al. (2019) found that parental stress and maternal chronic depressive symptoms resulted in lower sensitivity levels. In view of the evidence, it is worth thinking that digital media are used as a resource against stress, however, they can also negatively impact the quality of interaction, distancing mothers and children, forming a cycle of mutual influences.

The data analysis showed that in addition to technologies being a resource for mothers, the toddlers also used digital media as their own resource. In the episode of "ignoring," Bernardo (Case 2) and Camila (Case 3) more freely explored the environment with positive gestures and facial expressions, smiles, and vocalizations as a reaction to that moment. It is known that intrusiveness is characteristic of interactions with mothers who show symptoms of mental disorders (Hakanen et al., 2019). There are also associations between hostile mothers

and children's worse mental health (Janßen et al., 2019). So, one may think that in the cases where there was greater intrusiveness (Case 3) and hostility (Case 1 and 2), the maternal use of the smartphone could have reduced these behaviors, because as much of the mothers' attention was focusing on the smartphone. This, in turn, favored greater child involvement (Case 1) and child autonomy (Cases 2 and 3). Meanwhile, it is noteworthy that another qualitative study observed that when fathers and mothers used smartphones, the level of parental disengagement increased in relation to other distractors and could lead to problems, such as child endangerment (Lemish et al., 2019).

Evidence from the present study indicates that digital media has become a resource for mothers to vent the challenges of motherhood, and to facilitate their needs and daily routines. On the other hand, it was identified that there was less need for media use when there was higher maternal structuring and good child involvement, so the interaction happened satisfactorily. About digital media as a resource for children, it was possible to understand that maternal smartphone use helped to reduce maternal intrusiveness and hostility, which seemed to boost children's autonomy and their closeness to their mothers.

It is also necessary to highlight that the mothers in this present study have a high level of educational attainment, which may influence how the mothers use media with their children. Most studies found that lower maternal education was associated with greater infant screen exposure and use (Cárdenas-Fuentes, 2022; Krogh et al., 2021; Wiltshire et al, 2021). In this sense, a study from the United States showed that maternal graduate school education compared with college was a strong correlate of children's media exposure (Trihn et al., 2020). Still, the most recent census from Common Sense Media also presents a difference between screen use considering parents' education (Rideout & Robb, 2020). These differences can be explained by several factors, such as access to health professionals and services that may

provide scientifically based information (Sousa et al., 2021). In addition, there is a well-known positive relationship between maternal education and mental health (Wickham et al., 2017), as evidenced in this study, in which Claudia (case 3), who had lower education, had more symptoms of common mental disorders.

Implications

This study aimed to investigate the relationship between mother-baby interaction and digital media use in infants of mothers with symptoms of common mental disorders, which was revealed to be a complex phenomenon, where it is hard to set only one pathway relating digital media use, maternal mental health, and mother–baby interaction. Surprisingly, the mothers with the highest scores on the SRQ-20 for mental health problems were those who used digital media most creatively with their children. Some characteristics, such as the greater maternal structure and levels of responsiveness and child involvement from good to moderate, may facilitate a more interactive use of digital media.

With respect to the other mothers, there was a greater hostility present in the interaction, which, cyclically, could hinder a closer approach to the child and consequently impair the dyadic interaction. Another important point was that even in the presence of digital media, toddlers summoned their mothers, remaining active to establish an interactive exchange. This brought evidence to be better explored in new studies, that when mothers are consistently present and available in the interaction, children seek digital media less.

Additionally, mothers in this study have high educational attainment. Therefore, results should be read carefully, considering that this is not representative of the majority of the Brazilian population. However, this study follows all methodological guidelines for conducting qualitative research. Based on the assumptions of this approach, rather than aiming to generalize the results, the cases are selected in order to provide an in-depth exploration of the

phenomenon, considering the interconnection of its elements and its complexity in real life. Future studies may include participants with lower educational attainment to verify patterns, beliefs, and particularities regarding the digital media use by her and their children, and how those can be related to maternal mental health symptoms.

Lastly, it is worth mentioning some limitations. As the study had a cross-sectional design, it was not enable to infer causality relations in the studied phenomenon. In light of this, new studies could explore the relationships between maternal mental health, mother-baby interaction and digital media use longitudinally. Also, they could look into other factors that can be associated with the research topic, such as the onset, severity, and chronicity of maternal mental health problems and more subjective aspects of the mother's life history, that were not explored in the present investigation.

On the other hand, this research advances the literature by jointly investigating maternal mental health, mother–baby interaction, and the use of digital media in the dyad in a profound qualitative way, showing shades of how these factors interact. Furthermore, the authors employed two different data collection strategies (interview and observation of the mother–child interaction) to triangulate the data, enhancing methodological rigor. In addition, the different tasks during the mother–child interaction highlighted several interactive aspects of the dyad, which perhaps could not be observed in a situation of free play interaction. This study highlights the importance of thinking about the uniqueness of mother–child pairs in the context of maternal mental health problems and considering their digital media use. In sum, maternal mental health, and the quality of mother–baby interaction are important aspects to be addressed in interventions focused on promoting high-quality digital media use in families with young children.

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