Autism and family health: stress, eating behavior, and health in young children with ASD and their parents

Lubbe, A.L. van der

Chapter 6

General Discussion

6.1 General discussion

6.1.1 Aim

The aim of this dissertation was to examine associations between stress, eating behavior and physical and mental health in young children with ASD and their parents. The following questions were addressed:

1) Are there differences between parents of children with ASD and adults from the general population regarding parenting stress, eating behavior and physical health, and are these factors interrelated?
2) Is parental chronic stress related to chronic stress of their children, and to the mental and physical health of mothers and fathers of children with ASD?
3) What are obesity rates and associated child and parental factors in young, Dutch children with ASD?
4) How do chronic stress levels of young children compare to those of their peers, and how are they related to child mental and weight-related health?

Those questions were addressed in a large sample of young children with ASD and their parents.

6.1.2 Stress in parents of young children with ASD

In the study presented in Chapter 2, we addressed the question whether there are differences between mothers and fathers of children with ASD and adults from the general population regarding parenting stress, eating behavior and physical health. Also, we studied whether parenting stress was associated with eating behavior and physical health in both mothers and fathers. We studied this in families of young children with ASD, as previous studies demonstrated higher levels of perceived stress, higher incidence of reward-based eating and high levels of self-reported health problems in mothers of children with ASD compared to mothers of typically developing children. Moreover, in a study by Fairthorne and colleagues (2014) higher morbidity and mortality ratios were found in mothers of children with ASD. However, to date, most research

regarding parenting stress in parents of children with ASD is directed at mothers, while limited research has been performed on fathers. In addition, most research is performed in parents of children in a broad age range. We chose to study children in early childhood, as dynamics in early childhood may shape long-term health risks, laying the groundwork for health outcomes later in life.

The findings demonstrate that both mothers and fathers experience high levels of parenting stress. This indicates that elevated parenting stress levels are already present while their children are at an early age in both mothers and fathers. In addition, we found higher rates of obesity and metabolic syndrome in mothers of young children with ASD compared to females from the general population. This finding is noteworthy, as both conditions are known to elevate the risk of chronic illnesses, including cardiovascular disease and certain types of cancer. This finding is in line with the hypothesis proposed by Fairthorne and colleagues (2014), who observed higher mortality rates in mothers of children with ASD and suggested that this link may be mediated by increased maternal stress levels or health conditions, such as obesity.

We did not observe higher rates of obesity, hypertension, and metabolic syndrome in fathers of young children with ASD. Several factors could explain these different findings for fathers compared to mothers. One might hypothesize that there may be differences in the amount of time spent with their children, potentially resulting in less exposure to parenting stress in fathers. Variations in coping mechanisms between mothers and fathers can also explain differences. Another explanation may be that health disparities between fathers of children with ASD and the general population may emerge over time, as chronic stress can have a long-term impact on health through alterations in the immune system and microbiome imbalance (reviewed by Dijkstra–de Neijs et al., 2020).

We found a positive association between parenting stress and emotional and external eating in mothers of young children with ASD, indicating that the mothers who reported high levels of stress were also more likely to engage in disinhibited eating behavior, such as eating in response to emotions or external food cues. This finding is in line with earlier studies in the general population, that suggested chronic stress can

increase food consumption (Sominsky & Spencer, 2014). Radin and colleagues (2019) theorized that chronic stress related to taking care of a child with ASD may promote disinhibited eating behavior in the short term, which may potentially contribute to weight gain and negative changes in metabolic health, such as altered lipid profiles in the long-term. The current study supports this hypothesis, by demonstrating a positive relationship between parenting stress and disinhibited eating behavior. However, as we cannot draw causal conclusions based on our cross-sectional data, our findings point to the need for future longitudinal studies to further investigate these trajectories.

6.1.3 Hair cortisol as a biological marker of chronic stress in parents and children with ASD

In Chapter 3, we describe the findings of a study that examined physiological stress levels, using Hair Cortisol Concentrations (HCC), and the associations with mental and physical health in parents of young children with ASD. While most research on stress in these parents has focused on self-reported stress or short-term physiological stress levels, fewer studies have focused on chronic stress. Using HCC as a measure of chronic stress may provide further, objective insights into long-term stress of parents of children with ASD. To our knowledge, only one other study examined HCC in parents of children with ASD so far. This study demonstrated lower HCC levels in mothers of children with ASD compared to mothers of typically developing children, suggesting a dampening of the HPA-axis reactivity due to prolonged stress exposure (Radin et al., 2019).

In line with the study by Radin and colleagues (2019), we found that mothers of children with ASD who reported high levels of parenting stress demonstrated lower HCC. Previous studies that investigated short-term HPA-axis activity are in line with the findings of the current study, as these studies found an association between a higher level of perceived stress and a blunted cortisol response in mothers of children with ASD (Padden et al., 2019). Based on these findings, it could be suggested that chronic stress in mothers of children with ASD may be associated with a dampening of the HPA-axis reactivity, resulting in lower HCC, potentially as a biological adaptation to the

prolonged stress exposure. This blunted HPA-axis reactivity could reflect an adaptation of the body that is directed at protecting the body from the negative effects of sustained HPA-axis activation. However, a blunted HPA-axis response is also related to health risks, such as an impaired immune response (Tsigos et al., 2020).

Our findings reveal a positive connection between HCC of parents and HCC of their children with ASD. To our knowledge, this is the first study of these associations in families of children with ASD. This finding is significant, as it demonstrates how chronic stress may be shared within the family and may be associated with overall family well-being. We encourage future researchers to investigate whether this correlation is generalizable to older children with ASD. Moreover, it could be speculated that the connection is influenced by parenting strategies. For example, Ouellette and colleagues (2015) found a stronger association between HCC of mothers and their infants in mothers who used lower quality parenting strategies. Furthermore, genes could also play a role in this association. For example, some genes play a role in the HPA-axis regulation (Gerritsen et al., 2017). Therefore, we encourage future studies to explore the role of genetics and parenting strategies to better understand the dynamics of stress regulation within families.

While we did find a strong correlation between self-reported parenting stress and parental psychopathology symptoms, we did not find this connection between parental HCC and psychopathology symptoms. There could be different explanations for this discrepancy. For example, it is possible that variation within psychopathology symptoms could hide specific associations. It is possible that some behavioral or emotional problems are associated with a higher HCC, while others are associated with a lower HCC. For example, Staufenbiel and colleagues (2013) found increased HCC in patients with major depression, while they found lower HCC in individuals with anxiety disorders.

Our findings highlight that chronic stress may play a significant role in shaping family dynamics. This emphasizes the importance of future research to understand how these patterns emerge and whether these are generalizable to the whole ASD population and to each developmental stage. The current study also addressed a gap in knowledge

regarding the relationship between chronic stress and mental and physical health problems in parents of young children with ASD. The results reveal that self-reported parenting stress is strongly associated with increased mental health problems in parents of children with ASD, whereas the association with physical health problems is less consistent. Notably, the positive correlation between HCC and glucose levels in mothers suggests a potential link between chronic stress and physical health, but we did not find an association between chronic stress and the other physical health measures. It must be noted that the current study is cross-sectional and therefore we cannot make any causal conclusions. However, as parents of young children have higher risk for chronic stress and mental and physical health problems, preventive measures like parenting support, could improve parental care, by preventing the development of mental and physical health disorders in parents of children with ASD.

6.1.4 Obesity in children with Autism Spectrum Disorder

In Chapter 4, we evaluated obesity rates in young children (3 to 7 years) with ASD and explored possible factors associated with obesity. Given the significant health risks that are associated with obesity, examining the risk of obesity and associated factors in young children with ASD is crucial for understanding and potentially preventing health problems in this population. While obesity has been investigated before in children with ASD, most studies have focused on children across a wide age range. Early childhood may be a particularly important period to investigate obesity and related health problems, since early development may impact the risk of obesity and other health problems later in childhood, adolescence, and adulthood. Additionally, most research on obesity in children with ASD has been conducted in the United States, where obesity rates are higher than in other Western countries (Sammels et al., 2022).

In line with studies from the United States, we found higher obesity rates in Dutch children with ASD (17%) compared to same-aged children from the Dutch population (2%). Moreover, almost 9% of the children with ASD were classified as overweight, placing them at increased risk for obesity. As childhood obesity is associated

with various health risks later in life, it is important to target obesity and obesity-related factors in treatment and research of children with ASD.

We explored possible factors that could be associated with obesity in young children with ASD. First, we found an association between BMI and food approach behaviors in young children with ASD. While studies in neurotypical children yielded similar results, we think this is a particularly important finding, as studies demonstrate that children with ASD are more likely to engage in food approach behavior (Hess et al., 2010; Wallace et al., 2021). Secondly, we found that children with a higher BMI had mothers with a higher BMI. This is also in line with an earlier American study, identifying parental obesity as a strong predictor for obesity in children with ASD (Dempsey et al., 2017). Possible explanations for this could be genetic susceptibility, shared environment, or a combination of both. Again, this finding may be particularly important, given our previous study that demonstrated that 39.1% of the mothers of a young child with ASD had obesity and another 21.7% of the mothers were overweight. Similar to stress, the risk for obesity may not be an individual characteristic but could be significantly shaped by family dynamics. To better understand underlying mechanisms of obesity in families of children with ASD, more research is warranted.

6.1.5 Stress in children with Autism Spectrum Disorder

We evaluated differences in HCC between young children with ASD and same-aged children from the general population in the studies that are described in **Chapter 5.** To date, no studies have specifically investigated HCC in young children with ASD. Investigating HCC in this population could offer new insights into their biological susceptibility for stress. Also, we have explored associations between biological stress of children with ASD and their mental health, eating behavior and BMI. Lastly, we investigated associations between stress (self-reported and HCC) of parents of children with ASD and their children's mental health, eating behavior and BMI. A deeper understanding of these associations could provide valuable insights into the role of stress in the health of families of children with ASD. Such knowledge has the potential to enhance clinical care and support for children with ASD and their families.

We found that individuals with ASD had high HCC more often (15.3%) than same-aged children from the general population (2.5%), which could suggest a dysregulation of the HPA-axis. This finding is in line with the study by Ogawa and colleagues (2017), which was performed in a smaller sample (n = 34 versus n = 102 in our study) of older children (mean age = 11.9 years) with ASD. Further research into the trajectories and mechanisms behind HPA-axis dysregulation and its potential effects on mental and physical health could further enhance our understanding of chronic stress in children with ASD.

We found no associations between HCC of children with ASD and their mental health, eating behavior, or BMI. This suggests that while children with ASD may demonstrate higher stress levels, the relationship with these factors may be more complex and needs further investigation. Interestingly, we found associations between mental health of children with ASD and their parents' stress levels. More specifically, children who exhibited more behavioral problems had mothers and fathers who reported more parenting stress, and mothers who demonstrated lower HCC. A possible explanation for this could be that children with behavioral problems increase stress in their parents and that this stress leads to a dampening of the HPA-axis. This is in line with the study we described in **Chapter 3**, that demonstrates a negative correlation between reported parenting stress and HCC of parents. However, as the current study was cross-sectional, it is relevant to further investigate these relationships longitudinally.

6.1.6 Strengths and limitations

The key strengths of the studies described in this dissertation are the integrated approach, in which subjective self-report measures are combined with objective physiological and physical data in a large group of young children with ASD and their parents. This approach provides a more comprehensive picture of stress and its associations with mental and physical health in children with ASD and their parents. Additionally, including fathers in our sample addressed a significant gap in knowledge and enhanced our understanding of stress and health dynamics of fathers of young children with ASD. Another strength is the focus on young children (aged 3-7 years)

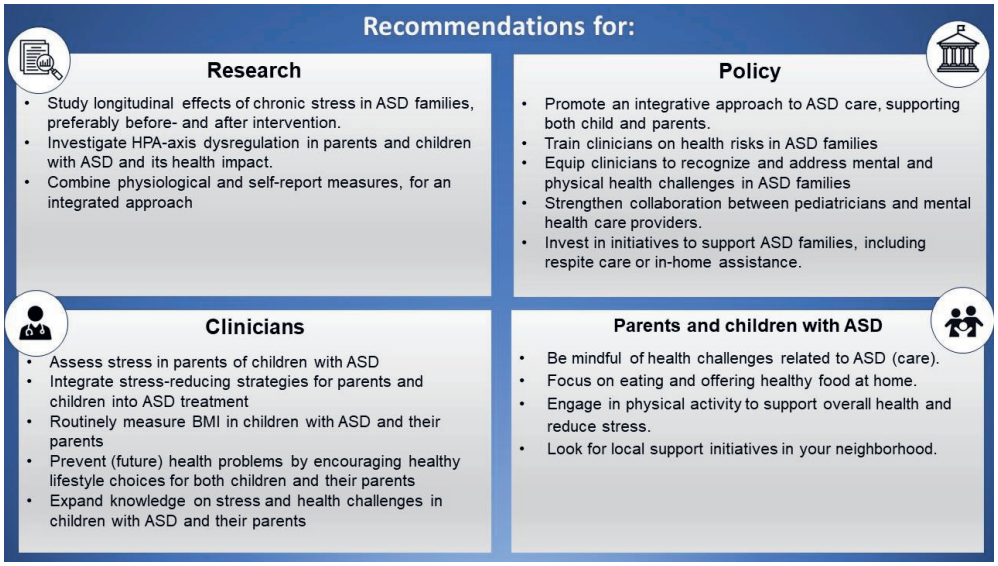
specifically, which allowed us to examine early developmental stages and gain insights into the early experiences of parenting a child with ASD. Having a better understanding of early processes can shape longitudinal studies and provide further understanding of the relevance of prevention and early intervention. Additionally, the associations between stress and health may be relevant for a broader group beyond children with ASD and their parents, extending to families facing other parenting challenges, such as raising a child with an atypical (neuro)developmental condition.

The current study has some limitations too. First, due to the cross-sectional design of the study, we cannot make any causal conclusions based on our data. However, our findings offer a valuable starting point for future longitudinal research, which is crucial for exploring how these associations evolve over time, particularly before and after interventions. For example, it may be relevant to study whether reducing parental stress through intervention has lasting effects on parental health in the years that follow. Furthermore, as we did not have a control group, we relied on normative data from the general population for comparison, which had some limitations. For example, some reference groups, such as those used for the Parenting Stress Questionnaire (OBVL) norms, consisted only of mothers. Future research could strengthen these findings by incorporating longitudinal designs and control groups to further validate the results.

6.1.7 Implications

The findings of this dissertation may have important implications for four domains: research, healthcare policy, prevention and intervention designed by clinicians that work with children with ASD and their parents and for daily family life. These implications are aimed to improve the lives of children with ASD and their parents, offering insights that could guide research, policy, clinical care, and families. The recommendations for each domain are summarized in Figure 1.

Figure 1. Recommendations for research, policy, clinicians, and families.



6.1.7.1 Future research

We encourage future studies to explore the longitudinal effects of chronic stress in children with ASD and their parents. Understanding how associations between stress, mental and physical health may develop over time, could help us to form more targeted and effective treatments for both parents and children. Furthermore, further research into HPA-axis dysregulation in parents and children with ASD can offer more insights into the stress regulation. Future studies could focus on possible factors that may play a role in stress dysregulation, such as coping strategies, chronicity of stress and glucocorticoid sensitivity. Lastly, parental stress should be considered as an outcome variable when evaluating the effectivity of interventions. As parental stress is linked to stress in the children and overall family health, reducing parental stress may improve well-being of the whole family.

6.1.7.2 Policy and clinical implications

The findings of this dissertation demonstrate the interrelated nature of stress and health in families of children with ASD. Therefore, there is a need for policy initiatives from

various stakeholders, including governments and health care institutions to promote an integrative approach to ASD care, focusing on both the child and their parents. Healthcare policies should encourage comprehensive screening for stress, mental health and physical health in both parents and children with ASD. Additionally, health professionals, such as psychologists, general practitioners, pediatricians, and psychiatrists, should be trained to recognize and address the mental and physical health challenges faced by parents of children with ASD. This could improve overall family health and contribute to a more holistic approach for children with ASD and their families. Moreover, the collaboration between health care professionals should be strengthened. For example, a consultation possibility where professionals from different fields (e.g. psychiatrist and pediatrician) see clients together, integrating their knowledge and combining their expertise to help individuals with ASD and their parents. Lastly, to alleviate stress in parents of children with ASD, the government should invest in local initiatives to support ASD families, such as respite care or in-home assistance.

Given that half of the mothers and one third of the fathers in our sample experienced parenting stress levels in the clinical range, it is crucial to draw attention to the well-being of both mothers and fathers of children with ASD in clinical settings, such as in mental health care institutions. Incorporating stress-reducing strategies in clinical practice, such as mindfulness-based interventions, could significantly benefit parents and may even positively impact their children's outcomes. Furthermore, addressing obesity risk factors and promoting healthy lifestyle choices for both parents and children with ASD should be a focus in clinical care of individuals with ASD. For example, it may be helpful to routinely measure BMI in children with ASD and their parents during intake. Early interventions, including psychoeducation on the risk of obesity and behavioral strategies for promoting healthy eating behavior and other healthy coping mechanisms may have long-term benefits for both children with ASD and their parents.

We encourage children with ASD and their parents to focus on providing healthy food at home. While this may be challenging, due to factors such as selective eating, or limited time for meal preparation, offering healthy options more frequently

and limiting unhealthy snacks may be beneficial. Seeking guidance from a dietitian with expertise in children with ASD could also be helpful. Additionally, engaging in physical activity to support both mental and physical health may reduce stress and improve family well-being. For the families that may find it difficult to make time for physical activity, small adjustments in daily routines, such as taking the stairs more often, or cycling or walking short distances – can still have a positive impact.

6.1.8 General conclusion

The findings of the current study reveal differences between children with ASD and their peers regarding biological stress and obesity. In addition, we observed elevated stress levels in both their mothers and fathers and found high rates of obesity and metabolic syndrome among mothers. It is important to recognize that the chronic stress and health risks that children with ASD and their parents experience may be interconnected. Considering these findings, it is crucial for preventive support and clinical care to address stress and health within families adopting a family-centered approach rather than focusing on individuals. This could involve promoting a health promoting lifestyle that benefit both parents and their children with ASD. To further understand the long-term effects of chronic stress on family health, future research is needed.

6.1.9 References

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6.2 Summary

In this dissertation, the question is addressed if stress, eating behavior and health are interrelated in young children with ASD and their parents. To gain a comprehensive understanding, an integrated approach is used, including children with autism and their parents in other to shed light on family dynamics on stress, eating behavior and somatic and mental health risk by use of self-reflection (questionnaires), physical assessments (Body Mass Index, blood pressure, waist circumference) and physiological measures (blood tests and hair cortisol).

In **Chapter** 1, the importance of studying stress, eating behavior, and health in young children with ASD and their parents is discussed. Children with autism and their parents face substantial daily challenges, and early stress may shape long-term mental and physical health. Although research demonstrates elevated stress levels in mothers, research regarding fathers, early childhood and long-term physiological stress markers is limited. Including fathers is essential, as they also play a unique role in their child's development. Early childhood is a particularly important period, as the behavioral and emotional patterns that are formed during this stage can have lasting effects throughout the individual's life. Research on how stress relates to eating behavior and health in individuals with autism and their parents may increase our understanding of associated factors and dynamics within the family, which may guide future research, strengthen clinical care and support the families in the long term.

In **Chapter 2**, it is addressed whether mothers and fathers of young children with ASD differ from adults from the general population regarding parenting stress, eating behavior and physical health. Both mothers and fathers of young children with ASD report high levels of parenting stress. Mothers of young children with ASD also demonstrate higher rates of obesity and metabolic syndrome compared to females from the general population, indicating an elevated risk for chronic illnesses. Parenting stress in mothers is positively associated with disinhibited eating behavior. Fathers do not demonstrate higher rates of obesity or metabolic syndrome.

In **Chapter 3**, both self-reported and physiological stress levels, as indicated by hair cortisol concentrations (HCC), in parents of children with ASD are examined. It is found that mothers of children with ASD who report high levels of stress, demonstrate lower HCC. Furthermore, a positive connection is found between HCC of parents and HCC of their children, suggesting that stress may be shared within the family. Parents of children with autism also show higher levels of psychopathology symptoms, such as depression and hostility, compared to same-aged males and females from the Dutch population. Moreover, a strong correlation between self-reported parenting stress and parental psychopathology symptoms is found. These findings indicate that stress levels of parents and their children are interrelated and demonstrates a link between parental stress and mental health, which emphasizes the importance of a family-focused approach in research and clinical care, as well as the need to monitor parental mental health.

In **Chapter 4**, obesity rates of young children with ASD are compared to those of their peers and it is explored which child- and parental factors are associated with obesity in these children. Compared to same-aged children from the Dutch population, children with ASD demonstrate higher obesity rates. Child Body Mass Index (BMI) is associated with food approach behavior and maternal BMI, suggesting that, in young children with ASD, shared environment, genetics, and family dynamics, may contribute to obesity risk. These findings highlight that early childhood may be an important period for identifying and supporting children with ASD at risk for obesity and for guiding families toward health lifestyle habits. making early childhood an important period for intervention and support.

In **Chapter 5**, HCC of young children with ASD and same-aged children from the general population is compared. In addition, associations between HCC of children with ASD and their mental health (autism symptoms, internalizing problem behavior, externalizing problem behavior), eating behavior and BMI are explored. Also, associations between stress (self-report and HCC) of parents of children with autism and their child's health, eating behavior and BMI are described. It was found that young children with autism more often show high HCC than same-aged children from the

general population. Child HCC is not directly associated with their mental health or BMI, indicating that biological stress of the child may not directly reflect these outcomes at this early age. However, maternal HCC is associated with behavioral problems in their children with autism. Additionally, self-reported stress of mothers and fathers is correlated with autism symptoms, behavior problems and eating behavior of their children with autism. This underscores how stress of parents are linked to specific aspects of child functioning in families of children with ASD, highlighting the relevance of assessing both parent and child factors in research and clinical context.

In **Chapter 6,** the implications of our findings and the strengths and limitations of the reported studies are addressed. The main strength is the family approach, combining self-reflection questionnaires, physical assessment and physiological measures in children, mothers and fathers. In addition, the focus on early childhood, offers insights into family dynamics during this specific developmental period in children with ASD. A limitation is the cross-sectional design, which prevents causal conclusions, leaving the direction of the associations unknown. Nevertheless, the observed associations provide valuable information for future studies that can further examine the relation between stress and health in families of children with ASD.

Implications of these findings are relevant for further research, clinical care, policy and daily family life. In future studies it might be important to further evaluate the dynamics of stress and health in children with ASD and their parents using longitudinal design, while also evaluating the impact of interventions that address stress regulation in parents on family well-being. The findings in this dissertation support a family-centered approach in clinical support that combines mental and physical care, monitors BMI, promotes a healthy lifestyle, and addresses parental stress, next to evaluation of psychological and social emotional impact. Policy initiatives could stimulate multidisciplinary interventions, targeted at reducing parental stress and supporting parental mental and physical health outcomes. For families, it is important to recognize the mental and physical health risks associated with (raising children) with autism. While our study did not examine causal effects, supporting healthy lifestyle habits, such as balanced nutrition and frequent physical activity, may promote mental

and physical health and could positively impact well-being of both children with ASD and their parents.

Taken together, the findings of the studies highlight the mental and physical vulnerabilities of young children with ASD and their parents, including an increased risk for chronic stress and obesity. Importantly, differences between mothers and fathers were observed, suggesting that parental stress may relate to child and parent health in distinct ways for mothers and fathers, highlighting the need to consider both parents in research and clinical practice. The findings emphasize the importance of addressing stress within the family system to promote health and well-being of both children with autism and their parents.

6.3 Nederlandse samenvatting

In dit proefschrift wordt onderzoek beschreven naar de vraag of stress, eetgedrag en gezondheid samenhangen bij jonge kinderen met autisme en hun ouders. Deze vraagstelling werd gemotiveerd vanuit de veronderstelling dat er samenhang kan bestaan tussen ouderlijke stress en mentale gezondheid van kinderen met autisme en hun ouders. Er is een geïntegreerde aanpak gebruikt, waarbij zowel kinderen met autisme als hun ouders zijn betrokken om zicht te krijgen op de familiedynamiek rond stress, eetgedrag en mentale en fysieke gezondheidsrisico's. Hiervoor zijn zelfrapportages (vragenlijsten), lichamelijke metingen (Body Mass Index, bloeddruk, middelomtrek) en fysiologische maten (bloedonderzoek en haarcortisol) gebruikt.

In **Hoofdstuk 1** wordt het belang van onderzoek naar stress, eetgedrag en gezondheid in jonge kinderen met autisme en hun ouders besproken. Kinderen met autisme en hun ouders ervaren dagelijkse uitdagingen, en vroege stress kan een effect hebben op hun mentale en fysieke gezondheid op de lange termijn. Hoewel er uit onderzoek blijkt dat moeders verhoogde stressniveaus hebben, is er beperkt onderzoek beschikbaar naar vaders, de vroege kindertijd en lange termijn fysiologische stressmarkers. Het betrekken van vaders is belangrijk, omdat zij ook een unieke rol spelen in de ontwikkeling van hun kind. De vroege kindertijd is daarnaast een belangrijke periode, omdat de patronen in die fase ontstaan, de basis kunnen leggen voor later. Onderzoek naar hoe stress samenhangt met eetgedrag en gezondheid bij jonge kinderen met autisme en hun ouders kan ons begrip van relevante factoren en dynamieken binnen het gezin vergroten, wat toekomstig onderzoek kan sturen, de klinische zorg kan versterken en gezinnen op de lange termijn kan ondersteunen.

In **Hoofdstuk 2** wordt onderzocht of moeders en vaders van jonge kinderen met autisme verschillen van volwassenen uit de algemene populatie op het gebied van ouderlijke stress, eetgedrag en lichamelijke gezondheid. Zowel moeders als vaders van jonge kinderen met autisme rapporteren hoge niveaus van ouderlijke stress. Deze moeders laten daarnaast een hogere percentages obesitas en metabool syndroom zien vergeleken met vrouwen uit de algemene populatie, wat kan wijzen op een verhoogd

risico op chronische ziekten op latere leeftijd. Ouderlijke stress bij moeders is positief geassocieerd met ongeremd eetgerag. Vaders laten geen verhoogde percentages obesitas of metabool syndroom zien.

In **Hoofdstuk 3** worden de resultaten beschreven van het onderzoek naar stress bij ouders van kinderen met autisme, met behulp van vragenlijsten en haar cortisol concentraties (HCC) en de relatie met de mentale gezondheid bij ouders en kinderen met autisme. Moeders met een hoog niveau aan zelfgerapporteerde stress, hadden lagere HCC. Daarnaast is er een positief verband gevonden tussen HCC van ouders en HCC van hun kinderen, wat suggereert dat stress wordt gedeeld binnen het gezin. Daarnaast rapporteren ouders van kinderen met autisme hogere niveaus van psychopathologische symptomen, zoals depressie, vergeleken met mannen en vrouwen van dezelfde leeftijd uit de Nederlandse populatie. Ook wordt er een sterke correlatie gevonden tussen zelfgerapporteerde ouderlijke stress en psychopathologische symptomen bij ouders. Deze resultaten laten zien dat stressniveaus van ouders en hun kinderen met elkaar samenhangen en dat er een verband is tussen ouderlijke stress en hun mentale gezondheid, wat het belang onderstreept van een familie gerichte aanpak in onderzoek en klinische zorg, en daarnaast de noodzaak laat zien om de mentale gezondheid van ouders te monitoren.

In **Hoofdstuk 4** worden de obesitas percentages van jonge kinderen met autisme vergeleken die van hun leeftijdsgenoten, en wordt er onderzocht welke kind- en ouderfactoren samenhangen met obesitas bij deze kinderen. Vergeleken met leeftijdsgenoten uit de Nederlandse populatie, laten kinderen met autisme hogere obesitaspercentages zien. Het Body Mass Index (BMI) van kinderen met autisme is gerelateerd aan voedseltoenaderingsgedrag en het BMI van moeder, wat wijst op een mogelijke bijdrage van de gedeelde omgeving, genetica en gezinsdynamiek aan het risico op obesitas. Deze bevindingen benadrukken dat de vroege kindertijd een belangrijke periode kan zijn om kinderen met autisme die risico lopen op obesitas te identificeren en te ondersteunen en om gezinnen te begeleiden naar gezonde leefgewoonten.

In **Hoofdstuk 5** wordt HCC van jonge kinderen met autisme vergeleken met HCC van leeftijdsgenoten uit de algemene populatie. Daarnaast wordt onderzocht

welke verbanden bestaan tussen HCC van kinderen met autisme en hun mentale gezondheid (autisme symptomen, internaliserende gedragsproblemen, externaliserende gedragsproblemen), eetgedrag en BMI. Ook worden de associaties tussen stress van ouders van kinderen met autisme (zelfgerapporteerde en HCC) en mentale gezondheid, het eetgedrag en BMI van hun kind beschreven. Uit de resultaten blijkt dat jonge kinderen met autisme vaker een hoog HCC laten zien dan leeftijdsgenoten uit de algemene populatie. Het HCC van kinderen met autisme is niet geassocieerd met hun mentale gezondheid, eetgedrag of BMI. Het HCC van moeders is echter wel gerelateerd aan gedragsproblemen bij hun kinderen met autisme. Daarnaast correleert de door moeders en vaders zelfgerapporteerde stress met autisme symptomen, gedragsproblemen en eetgedrag van hun kinderen met autisme. Dit benadrukt dat ouderlijke stress gekoppeld is aan het functioneren van het kind met autisme, en onderstreept het belang van het meenemen van zowel ouder- als kind factoren in onderzoek en de klinische praktijk.

In **Hoofdstuk 6** worden de implicaties en de sterke en zwakke punten van de gerapporteerde onderzoeken besproken. De belangrijkste sterkte van het onderzoek is de familiegerichte benadering, waarbij zelfrapportage vragenlijsten, lichamelijke metingen en fysiologische metingen bij kinderen, moeders en vaders werden gecombineerd. Daarnaast biedt de focus op de vroege kindertijd inzicht in de familiedynamiek tijdens deze specifieke ontwikkelingsfase bij kinderen met autisme. Een beperking is het cross-sectionele onderzoeksopzet, waardoor er geen causale conclusies kunnen worden getrokken en de richting van de geobserveerde associaties onbekend blijft. Desondanks bieden deze bevindingen waardevolle informatie voor toekomstig onderzoek naar de relatie tussen stress en gezondheid in gezinnen van kinderen met autisme.

Implicaties van deze bevindingen zijn relevant voor verder onderzoek, de klinische praktijk, beleid en het dagelijkse gezinsleven. In toekomstige studies is het belangrijk om de dynamiek tussen stress en gezondheid bij kinderen met autisme en hun ouders longitudinaal te onderzoeken, terwijl ook de impact van interventies gericht op stressregulatie bij ouders op het gezinswelzijn wordt onderzocht. De bevindingen in

dit proefschrift ondersteunen een gezinsgerichte benadering in de klinische praktijk, waarbij mentale en fysieke gezondheidszorg wordt gecombineerd, BMI wordt gemonitord, een gezonde leefstijl wordt bevorderd en ouderlijke stress wordt meegenomen, naast de evaluatie van de psychologische en sociaal-emotionele effecten. Beleidsinitiatieven kunnen multidisciplinaire interventies stimuleren, gericht op het verminderen van ouderlijke stress en het ondersteunen van ouderlijke mentale en lichamelijke gezondheid. Voor gezinnen is het belangrijk om zich bewust te zijn van de mentale en fysieke gezondheidsrisico's die gerelateerd zijn aan (het opvoeden van een kind met) autisme. Hoewel ons onderzoek geen causale verbanden heeft onderzocht, kan het stimuleren van een gezonde leefstijl, zoals een evenwichtige voeding en regelmatige fysieke activiteit, de mentale en fysieke gezondheid bevorderen en mogelijk het welzijn van zowel kinderen als hun ouders positief beïnvloeden.

Samenvattend tonen de onderzoeken de mentale en fysieke kwetsbaarheden van jonge kinderen met autisme en hun ouders, waaronder een verhoogd risico op stress en obesitas. Belangrijk is dat er verschillen tussen moeders en vaders werden gevonden, wat suggereert dat de manier waarop ouderlijke stress samenhangt met de gezondheid van het kind en van de ouder zelf verschilt tussen moeders en vaders. Dit onderstreept de noodzaak om beide ouders mee te nemen in onderzoek en de klinische praktijk. De resultaten benadrukken het belang van het aanpakken van stress binnen het gezinssysteem om gezondheid en het welzijn van zowel kinderen met autisme als hun ouders te bevorderen.