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Nutritional and Growth Issues Related to Child Neglect

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Abstract

Child neglect and obesity are major public health problems that undermine children's health and contribute to lifelong disparities. Most of the past research has focused on relations between child neglect and failure to thrive. This article finds that evidence linking child neglect with obesity is mixed. In a recent meta-analysis, five of the eight studies reviewed did not find an increased risk of obesity among neglected children. The case study and three longitudinal studies that reported a relationship between neglect and obesity were conducted among young children, and used caregiver or teacher/clinician definitions of neglect, rather than referrals to state protective service agencies. Dysregulation of the neuroendocrine system associated with neglect has been implicated, but further research is needed to understand the mechanisms that may increase children's risk for obesity. Findings suggest that under some conditions neglect may increase the risk for excessive weight gain, and that high body mass index may be an indicator of possible neglect. By exploring both possibilities, clinicians can promote children's healthy growth and development and prevent subsequent health disparities.



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Child neglect and pediatric obesity are major public health problems affecting millions of children in the US. The National Child Abuse and Neglect Data System reported that in 2011, 75% of the 3.4 million child abuse and neglect referrals, representing 6.2 million children, were classified as neglect, with the majority under 3 years of age.¹ Rates of pediatric overweight (body mass index [BMI] >85th percentile) have increased significantly over the past three decades, reaching 23% among preschoolers (ages 2–5), 34% among elementary school-age children (ages 6–11), and 34% among adolescents (ages 12–19).² Past research on child neglect and failure-to-thrive has identified common aspects of social and environmental dysfunction,^{3,4} with increasing evidence that similar psychosocial problems can manifest in obesity.⁵

NUTRITIONAL AND GROWTH ISSUES RELATED TO CHILD NEGLECT

The recently released Institute of Medicine/National Research Council report “New Directions in Child Abuse and Neglect” reaffirms that neglect (and other forms of maltreatment) can impact children throughout life, often depending on the timing, chronicity, and severity of the neglect.¹ Although the report documents declines in the rates of sexual abuse and physical abuse over the past two decades, there is no evidence that neglect is declining. In addition, the report points to new findings in neuroscience and genomics regarding the biological and social consequences of neglect.

Pediatric obesity (BMI >95th percentile), a defining health care problem of this century,² contributes to health disparities by increasing the risk for hypertension, asthma, musculoskeletal problems, obstructive sleep disorders, type 2 diabetes, depression, and social stigmatization.^{6,7} Recent evidence has shown that the incidence of obesity frequently occurs during the preschool years, setting children onto a trajectory of obesity throughout childhood and into adulthood.⁸ The early origins of obesity emphasize the importance of helping young children build healthy habits that form the basis of long-term lifestyle habits and reduce disparities.^{9,10}

The consequences of both neglect and obesity can be far-reaching, impacting not only children, but also their families and society. Both problems are more common in families of lower socioeconomic class, with origins early in life, often during the preschool years. However, until recently the two public health problems have been considered independently, with little attention to common features or how they might be related. This article reviews the evidence linking neglect to physical growth among children, adolescents, and adults (both underweight and obesity); examines the mechanisms that may underlie the associations between neglect and growth; and makes recommendations for subsequent research and clinical practice regarding neglect and deviations in growth.

Neglect and Underweight

Neglect has a long association with underweight, often attributed to caregiver lack of knowledge, depression, or inability to meet children’s nutritional and developmental needs, resulting in children not receiving adequate calories.^{3,4} However, systematic investigations have not supported associations between neglect and underweight, suggesting that they may vary by the definition of neglect and the surrounding context.^{11,12}

Neglect and Obesity

The evidence regarding neglect and obesity is mixed. A recent meta-analysis that examined the association between types of maltreatment (including neglect) and health outcomes (including obesity) identified 124 articles.¹³ Overall, neglect was not associated with an increased risk for obesity. However, in a subgroup, neglect was associated with a higher risk of obesity when weight and height were self-reported, rather than measured. Both physical abuse and emotional abuse were associated with an increased risk for obesity. The findings are particularly difficult to interpret given the methodological variability in the studies. Most studies used a cross-sectional, retrospective design (only 16 of 124 were prospective) with self-reported data, raising concerns about recall bias, single-source reporting, and correlational findings. Other concerns were the frequent skewing toward low-income families, with possible confounds with poverty; varying age at the time neglect was documented; varying length of follow-up; and varying definitions of neglect. Relying exclusively on child protective service (CPS) records may introduce at least two sources of bias.¹⁴ First, neglect is frequently under-reported to CPS, suggesting that only the most severe cases of neglect are reported and substantiated, increasing the possibility that children in the comparison group may have experienced neglect. Second, children identified through CPS may have received services and therefore have fewer associated problems than children who were neglected, but unknown by a CPS agency.

From a systematic search, we identified eight studies and a case report that examine whether neglect alters the likelihood of obesity. An early description of an association between neglect and childhood obesity was a case report of 12 children living in families with severe dysfunction.⁵ Family dysfunction was characterized by separation of the child from mother, failure to seek appropriate medical care, and/or maternal mental instability, which limited the ability to effectively set limits. These issues are comparable to those seen in families of children with severely impaired growth. An early study to examine the association between neglect and obesity was conducted among more than 800 nine to 10-year-old children in Denmark who were followed prospectively over 10 years.¹⁵ Neglect was defined through teacher reports of poor hygiene and low parental support. Although neglect was not related to obesity when the children were enrolled at age 9–10 years, as young adults, the odds of obesity among neglected children were 7–10 times higher than among the non-neglected children, even after adjusting for body size at the initial assessment, parental BMI, and multiple environmental factors.¹⁵ These findings also point to the recommendation that obesity prevention programs should begin early in life and include family caregiving factors.

Three studies were conducted among children who ranged in age from 3–9 years. One involved over 2,400 pre-schoolers participating in the Fragile Families and Child Wellbeing Study, a birth cohort of children recruited from 75 hospitals in 15 states that oversampled children of single mothers.¹⁶ Three-year-old children were weighed and measured and their parents reported on their child-rearing practices on the Conflict Tactics Scale, which included subscales for neglect, minor violence (corporal punishment), and psychological aggression. Rates of neglect were relatively low (11%), but generally consistent with rates of corporal punishment (14%) and psychological aggression (10%). Analyses controlled for other factors that have been associated with obesity, including poverty, maternal BMI, race/

ethnicity, age, smoking, child sex, and birth weight. The odds of obesity were 50% higher for children who experienced neglect in the past year compared to no neglect (24% vs 18%). Neither corporal punishment nor psychological aggression was associated with obesity.

The second study involved 185 predominantly African American children (ages 4–6 years).¹¹ Almost 50% had been referred to a CPS agency for neglect; the other half had no history of maltreatment. Children's weight and height were measured annually for 3 years. Although both the neglect and comparison groups had BMIs significantly higher than national norms, a history of neglect did not consistently predict risk of either underweight or overweight over time.

The third study in this grouping included over 500 socially disadvantaged children in the Midwest (61% white) who ranged in age from 3–9 years.¹⁷ Using parent-responder interviews and a home visit, two types of neglect were identified: care neglect (lack of basic items such as a toothbrush, lack of routine medical or dental care, and unsafe or high-risk household conditions) and supervisory neglect (parents lacked awareness and ability to manage child's activities). The relation between neglect and obesity varied by the age of the children, with care neglect related to high BMI percentile among the younger children and care supervision related to high BMI percentile among the older children.¹⁷

Two studies examined the link between neglect and obesity among adolescents. One involved over 8,000 children enrolled in the National Longitudinal Study of Adolescent Health and examined growth trajectories from adolescence into adulthood.¹⁸ The adolescents responded to single questions regarding the frequency of past physical abuse, sexual abuse, and neglect. Growth was examined over time, adjusting for confounders associated with obesity. In adulthood, there was no difference in BMI between adults with a history of neglect only (no sexual or physical abuse) and adults with no history of maltreatment, but adults who had experienced both neglect and physical abuse had a significantly higher BMI. However, when weight gain from adolescence to adulthood was considered, the adults in the neglect-only group had a significantly faster BMI growth rate than the adults with no maltreatment history or those with a history of both abuse and neglect. It is not clear why the neglect-only group experienced an accelerated rate of weight gain; additional clarification and follow-up are needed to understand long-term growth patterns.

The second study among adolescents included approximately 300 adolescents who had been referred to the state agency for maltreatment and a comparison group of approximately 150 adolescents with no history of maltreatment.¹⁹ Three-quarters of the adolescents were from racial/ethnic minority families (approximately 36% African American and 40% Latino) and 61% of the comparison group adolescents were overweight. The adolescents with a history of neglect were less likely to be overweight compared to adolescents without a history of maltreatment.¹⁹

Two long-term follow-up studies examined the association between a history of neglect and obesity in middle adulthood. One study was conducted in a Midwest county among over 400 adults with a documented history of abuse or neglect and a comparison group of

approximately 300 nonmaltreated adults, matched on age, sex, race/ethnicity, and social class.²⁰ In a 30-year follow-up (mean age 41 years) in which weight and height were measured, the adults with a history of neglect were not at increased risk for obesity, while the adults with a history of physical abuse had higher BMI scores than the comparison group, even after adjusting for demographic characteristics, and tobacco and alcohol use. Over 80% of the adults had a history of neglect (may have included physical abuse) and rates of obesity were approximately 40% in both the neglect and comparison groups.²⁰

Another long-term follow-up of over 9,000 adults (mean age 45 years) in the 1958 British birth cohort examined the association between childhood adversities, including neglect, and adult health, including obesity (measured weight and height).²¹ Neglect was measured throughout life by parent or teacher report and during adulthood by retrospective recall. Some aspects of neglect, such as little parental interest in education, were associated with an increased likelihood of obesity; other aspects were not. Findings were often attenuated by adjustment for socioeconomic status, illustrating the associations between neglect and low socioeconomic status and emphasizing the importance of considering contextual factors.

In summary, the three studies that showed an association between neglect and overweight/obesity^{15–17} used a prospective design, defined neglect through parent or teacher questionnaires or observations (rather than referral to a state CPS agency), and focused on neglect that occurred relatively early in life. The studies that examined whether neglect was associated with obesity in adolescence had conflicting findings; one reported no associations¹⁸ and the other reported reduced risk of obesity among adolescents with a history of neglect.¹⁹ The studies that extended follow-up into middle-age^{20,21} found few associations between neglect and obesity. The high rates of obesity among adults in the samples indicate that multiple factors contribute to obesity throughout life.

MECHANISMS LINKING NEGLECT AND WEIGHT

The mechanisms underlying the associations between neglect and obesity appear to be influenced by age, poverty, and stress. Associations between neglect and obesity were strongest among young children^{16,17}—including the one study that examined differential relations between neglect and obesity by age¹⁷—perhaps because young children are highly dependent on their caregivers. Thus, neglect that is characterized by low nutrient-dense food and few opportunities for physical activity may be associated with obesity among young children who have few options.

Obesity among young children has been associated with genetic, biological, and environmental factors, such as sleep duration and sedentary behavior.²² The finding that neglect has been associated with an increased risk for obesity among young children supports the role that age plays in children's vulnerability to neglect-related obesity. Additional attention is needed urgently to identify strategies that prevent neglect and may reduce the prevalence of obesity early in life.

In economically flourishing countries like the US, poverty increases the risk for both neglect and obesity. In turn, the economic consequences associated with neglect and obesity

contribute to poverty, ranging from limited individual employment opportunities to societal economic losses.^{23,24} Childhood poverty has a strong relationship with poor adult health,²⁵ and is potentially exacerbated by neglect.

The pessimism, depression, conflict, violence, and limited economic and social opportunities inherent in poverty often result in chronic family stress.²⁶ Children internalize family stress, which may be heightened by neglect and the emotional or physical withdrawal of caregivers. Unlike abuse, which may be a dramatic action toward children, sometimes in response to their behavior, neglect is the absence of involvement and may be perceived by children as a denial or diminution of their existence.¹⁶ Stress early in life can disrupt the development of the neuroendocrine response system,²⁷ and cause dysregulation of the hypothalamic pituitary adrenal (HPA) axis, leading to the increased release of cortisol, ghrelin, insulin, and proinflammatory cytokines.²⁸ Under chronic stress exposure, as is typical in neglect, excessive levels of cortisol could contribute to weight gain and overeating. In addition, the changes to the HPA axis due to chronic stress could impact the body's ability to regulate metabolism, which could result in physiological changes such as weight gain in response to the comforting effects of food and increased eating.

RECOMMENDATIONS FOR RESEARCH AND CLINICAL PRACTICE

Methodological problems are complex in investigations of child neglect. Research is primarily correlational and conducted in the presence of multiple confounds, most notably poverty. The definition of neglect is a major concern with little consistency across studies. Defining neglect by relying on referrals to CPS agencies introduces biases and misses children who do not come to the attention of these agencies.¹⁴ Multiple methods that combine observation and reporters (parents and teachers) longitudinally may provide a comprehensive view (although complicated to organize). Attention to the timing, type, and chronicity of neglect relative to children's age, would improve our understanding of the developmental vulnerability of children. Little attention has been given to protective mechanisms that enable children to avoid the negative consequences associated with neglect. Prevention trials among at-risk children and families, together with intervention trials among children who have experienced neglect could provide relevant information on protective or compensatory mechanisms. Finally, studies that examine children's stress reactivity may lead to better understanding of how neglect impacts early brain development and the neuroendocrine system.

Although the evidence linking neglect and obesity is mixed, it is plausible that children in stressful contexts may be at increased risk for excessive weight gain, associated with dysregulation of the HPA axis. Thus, strategies to alleviate stress and to help children learn to cope with existing stress may help them avoid obesity-related risks. In addition, although there are multiple factors that contribute to excessive weight gain, children with obesity may be experiencing excessive stress and benefit from stress alleviation intervention.

The research reviewed in this article addressed children in high-income countries because data were not available from low- and middle-income countries. However, neglect is a global concern and research should not be limited to high-income countries. The World Health

Organization's global adverse childhood experiences research network and the International Society for the Prevention of Child Abuse and Neglect's Child Abuse Screening Tools may be useful for global investigations.

CONCLUSION

The origins of many adult physical health problems occur early in life, and are often caused either by cumulative stress or by dysregulation of developmental processes (eg, HPA axis) during sensitive developmental periods.^{29,30} Children from low-income and racial/ethnic minority families are at increased risk for both neglect and obesity, illustrating the early origins of disparities that can compromise health throughout life. Although some studies have shown that neglect increases the risk for obesity, particularly among young children, there is conflicting evidence. Dysregulation of the HPA axis has been implicated, but further research is needed to understand the mechanisms that may increase children's risk for obesity. Findings suggest that under some conditions, neglect may increase the risk for excessive weight gain, and that high BMI may be an indicator of possible neglect. By exploring both possibilities, clinicians can promote children's healthy growth and development and help to prevent subsequent health disparities.

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