

NUTRITION AND ECD: DO WE HAVE THE RIGHT RECIPE?

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Obesity is on the increase, with adult-type diabetes seen more often in kids. Fast-food restaurants line up beside the home kitchen as a regular source of family meals. Obese children are ridiculed and others diet themselves to death. Meanwhile, less materially advantaged countries continue to struggle with under-nutrition and malnutrition that prevent optimal physical and psychosocial development.

No matter whether we live in Canada or Mauritius, we are challenged to provide a diet that will promote optimal development in our children. Fortunately, the body of evidence for what we should do, if we choose to do so and have the resources, is growing. Some of this evidence is presented in the three articles contained in this issue.



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Most scientific and popular publications about nutrition discuss the impact of nutrition on optimal physical growth and the prevention of chronic illness. We now know that nutrition is also important for children's psychosocial development. "Are Carrots Good for Self-Esteem?" points out the importance of breastfeeding, not only from the perspective of supplying optimal nutrition for an infant, but also in terms of how it affects and reflects the mother-child relation.

All caregivers rely on cues to decide when to give food to someone in their care. "Baby is Not Always Crying for Food!" demonstrates the relationship between food and behaviour. Many young mothers' typical response to their crying child was to give them food, assuming that the cry indicated hunger. After the young mothers in the study were taught to look for other reasons for children crying, they were far less likely to use food as the first technique to pacify a crying baby.

"Eating Well for Mental Health" reports on a 15- and 20-year follow-up assessment of three-year-old Mauritians, many of whom were malnourished and came from poor families. Over two years, randomly se-



lected children were given nutritionally balanced meals, physical activity and cognitively stimulating activities. A large number were re-assessed when they were 17 and 23 years old. Although 15 years had elapsed since the preschool intervention, children who received the enrichment program had lower levels of antisocial and criminal behaviour. Those who were malnourished at age three had lower mean scores on a measure of symptoms of schizotypal personality disorder.

The study of Mauritian children is an example of the type of research required to assess the relationship between enriched physical and psychosocial environments during early childhood and outcomes during adulthood. The randomization of research participants to different interventions, the careful collection of participants at follow-up and the length of the follow-up period yielded evidence that could not be supplied by a study with a short follow-up period, or by a study in which the impact of the intervention could not be disentangled from other influences on the participants. The bottom line for front-line workers and policy-makers: early intervention works! 🍴

ARE CARROTS GOOD FOR SELF-ESTEEM?



by Liz Warwick

“Eat your carrots if you want to have good eyesight. Drink your milk for strong bones.” Many of the messages relating to food and children focus on the health benefits of good nutrition. “Eat well to grow well,” we tell our kids. Yet how do nutrition and food relate to other kinds of growth, such as social, emotional and cognitive growth? Researchers are now looking at how nutrition in general — not just what kids eat but how, when and under what circumstances — has an impact on their overall development.

FOOD MATTERS EARLY ON

Long before a baby takes a first gulp of milk, she or he will have received the benefits — or consequences — of the mother's food choices. *“Adequate nutrition in women is one of the most crucial components of a healthy society,”* notes Elizabeth Reifsnider of the University of Texas Health Science Center. Reifsnider points out that women who enter pregnancy undernourished or do not eat well during those nine months are more likely to have babies born prematurely, with low birth-weights or exhibiting retarded growth patterns.

These children are, in turn, at risk for a host of developmental problems. Sheila M. Innis of the University of British Columbia points out, *“Preterm and low birth-weight infants are at increased risk for major handicaps, as well as below-average cognitive abilities and above-average behavioural problems at school age, even among infants without obvious neurological deficits.”* From the increased prevalence of Attention Deficit Hyperactivity Disorder (ADHD) to deficits in language and memory skills, children born to poorly nourished mothers start off at risk.

IMPORTANCE OF BREASTFEEDING

Once baby emerges from the womb, parents must make decisions about how

and what to feed the child. The by-now-familiar refrain that “breast is best” derives from many studies that show breastfeeding offers health benefits, such as reduced risk of infections and protection from cardiovascular disease, diabetes and obesity. However, the short — and long-term psychosocial benefits of breastfeeding are far less clear. One of the difficulties facing researchers is that women who choose not to breastfeed or who breastfeed for only a short time also tend to be younger, less well educated and poorer, all factors that have been associated with psychosocial problems in children, thus making it very difficult to determine which factors contribute most to which behaviours.

However, some short-term studies have shown that breastfeeding may improve the mother-baby relationship. It is critical for young babies to have a strong nurturing attachment to at least one caregiver, and breastfeeding may help promote this kind of bonding. Nursing mothers have reported lower levels of perceived stress, fewer negative moods and more positive feelings about their babies and their own parenting skills. Very young breastfed babies (a few weeks old) also showed improved alertness, better self-regulation, fewer abnormal reflexes and signs of withdrawal than their formula-fed counterparts.

In the long term, breastfed infants are less likely to develop weight problems or obesity, both of which are on the increase in children. Being overweight has a significant impact on a child's self-esteem and overall psychosocial development as well as on his or her health. Studies have also shown a small, but statistically significant, difference in IQ between breastfed and formula-fed babies. The difference was even more pronounced for preterm babies who were breastfed, suggesting that certain compounds in breast milk, particularly what are known as long-chain fatty acids, have an even greater impact on babies born early.

GETTING FEEDING CUES RIGHT

However, whether parents choose breast milk, formula or some combination of the two, the feeding dynamic between baby and caregiver is important for the child's long-term development. As Maureen Black of the University of Maryland School of Medicine notes, *“Healthy feeding behaviour begins in infancy, as infants and their caregivers establish a partnership in which they recognize and interpret both verbal and non-verbal communication signals from one another. This reciprocal process forms a basis for the emotional bonding or attachment between infants and caregivers that is essential to healthy social functioning.”*

“Healthy feeding behaviour begins in infancy, as infants and their caregivers establish a partnership”

Unfortunately, babies who cannot or do not provide clear signals about hunger and satiety or do not respond to the establishment of predictable routines for eating, sleeping and playing are at risk for developing various problems, including feeding problems. Caregivers who do not “read” their baby’s hunger cues may overfeed their babies and put them at risk for weight problems or obesity later in life.

IDENTIFYING FEEDING PROBLEMS

The complex interaction between a baby and a caregiver, the types of food offered and under what conditions it is offered may result in feeding problems ranging from mild (occasional refusal to eat certain foods) to quite severe (when a child is malnourished and fails to thrive). Mealtime difficulties have been reported in 25 to 35% of normally developing children, but only 1 to 2% will exhibit severe feeding problems.

However, as researchers Cathleen C. Piazza and Tammy A. Carroll-Hernandez of the Marcus Institute note, “*Long-term chronic food problems result in increased health problems for children, greater stress for the families, an increase in mental health problems in the family and a greater risk of developing eating disorders such as anorexia later in life.*” Studies have also established a link between inadequate nutrition in the early years and an increased incidence of antisocial personality disorder, schizophrenia and affective psychosis. Thus, identification and treatment of these problems must be a priority. “*Because children have*

feeding problems for a variety of reasons, treatment should focus on all of the components (biological, oral, motor, and psychological) that contribute to feeding problems and should be interdisciplinary,” they state.

PROVIDING NUTRITIONAL SUPPORT

Ensuring that children receive adequate nutrition, both prenatally and in the years from conception to five, is crucial. Laura E. Caulfield of the Centre for Nutrition at Johns Hopkins University points out, “*Women and children are still some of the most vulnerable members of society, and the need for special provisions will likely remain for many years to come.*” She and other experts urge an integrated, life-course approach to program and services. A healthy, well-nourished woman is more likely to give birth to a healthy, well-nourished baby, so nutrition programs must target women not just during pregnancy but pre-conception, during lactation and between pregnancies. Then, children need the best nutrition possible, especially in the early years when they are growing and developing rapidly.



Programs such as the *Supplemental Nutrition Program for Women, Infants, and Children (WIC)* in the United States, which provides food vouchers for low-income women and children, have been shown to improve birth outcomes in terms of prematurity and low birth-weight. The WIC program may also have contributed to a decline in anemia among poor children. However, more studies are needed to determine if WIC has had an impact on children’s overall development.

The interaction between nutrition and a child’s physical, social, emotional and cognitive growth is complex and as yet only beginning to be explored through rigorously designed studies. New programs and policies must be supported by the best research possible. However, concrete steps, such as encouraging and facilitating good nutrition for pregnant women, promoting breastfeeding and helping caregivers understand both what constitutes a healthy diet and also what good eating habits are, will go a long way to ensuring that young children truly thrive. 🦋

Ref.: Reifsnider E. Effective nutritional practices and policies for childbearing and childrearing women. 2003:1-5.*

Innis SM. Nutrition and its impact on psychosocial child development: Preterm infants. 2003:1-6.*

Black MM. Helping children develop healthy eating habits. 2003:1-5.*

Piazza CC, Carroll-Hernandez TA. Assessment and treatment of pediatric feeding disorders. 2004:1-7.*

* In: Tremblay RE, Barr RG, Peters RDeV, eds. Encyclopedia on Early Childhood Development [online]. Montreal, Quebec: Centre of Excellence for Early Childhood Development; Available at: www.excellence-earlychildhood.ca/encyclopedia

BABY IS NOT ALWAYS CRYING FOR FOOD!

by Liz Warwick

Ideally, an infant will receive nothing but breast milk or, as a second choice, formula from birth to four or six months. Yet this recommendation may go unheeded by parents. Worried that their baby is hungry or desperately wanting him to “sleep through the night,” parents sometimes put cereal into the bottle or offer spoonfuls of soft foods. Although the health risks of these “complementary foods” have not been firmly established, there is evidence that early introduction of solids increases a child’s risk of allergy, infections, obesity, choking and food aversions.



Recently, a team of researchers created a program aimed at reducing this complementary feeding in babies born to African-American adolescent mothers. These teen moms are often influenced by cultural and family norms pushing early introduction of solids. The team recruited two groups of young, low-income mothers living in multigenerational households. They asked each mother in the intervention group to meet once every two weeks with a trained mentor, herself a mother of young children.

The mentors showed the young mothers a videotape featuring other teen moms

that discussed caring for baby, as well as negotiating conflicts between mothers and grandmothers. During the follow-up visits, mentors offered information and strategies for reading baby’s cues and non-food related ways of soothing a baby.

After three months, the researchers surveyed both groups about their feeding patterns. While 61% of the mothers had offered their babies complementary foods, mothers who had received mentoring were less likely to do so. Young mothers in the intervention group were four times more likely to say no to complementary foods than those in the control group.

Dr. Maureen Black, Professor of Pediatrics and Medicine at the University of Maryland School of Medicine and the study’s lead researcher, says a key element in the study was providing information about how to read a baby’s cues. Too often, parents equate crying with hunger. “Crying is how babies communicate,” says Black. “The mentors helped the mothers recognize that their baby’s crying didn’t necessarily mean the baby was hungry. The baby might be tired, want stimulation or need a diaper change. We wanted to help mothers find more options instead of just giving food.”

Parveen Girn, a clinical dietician at the Children’s and Women’s Health Centre of British Columbia in Vancouver, says the study highlights the need to close the information gap between health-care professionals and parents. Girn adds that, “All people involved in a baby’s care should be included in discussions about feeding.” Information about good feeding habits must also be provided in a way that acknowledges the experience of extended family, yet reinforces current feeding guidelines.

“Parents and caregivers might also benefit from learning how to read baby’s cues,” Girn added. “Babies are people with complex emotions. They can be in a bad mood and crying but not be hungry. It’s not always about food.” Some parents need help figuring out how to soothe a baby. “We have to get away from popping a bottle or pacifier into baby’s mouth,” she says. 🐾

Ref.: Black MM, Siegel EH, Abel Y, Bentley ME. Home and videotape intervention delays early complementary feeding among adolescent mothers. *Pediatrics* 2001;107(5):E67.

EATING WELL FOR MENTAL HEALTH

by Liz Warwick

Giving kids a healthy start through good nutrition, regular exercise and age-appropriate education may protect them from developing mental health problems, specifically schizophrenia and conduct disorders, in adulthood.

In a recent study, researchers examined the long-term impact of a high-quality preschool program on children living in Mauritius. Many of the children suffered from malnutrition and came from very poor families with little education.

The researchers randomly selected a group of three-year-olds to attend, over a period of two years, a special preschool program where they received nutritionally balanced meals, two and a half hours a day of physical activity and a range of educational activities focused on developing verbal, memory and conceptual skills. A control group of three-year-olds received a traditional community education at a “petite école” where they had no structured exercise program and usually ate only rice or bread for lunch.

LOWER RATES OF SCHIZOPHRENIA AND CRIMINALITY

Several years later—when the children had reached ages 17 and 23—researchers interviewed them, looking specifically for signs of early schizophrenia (schizotypal personality disorder) and conduct disorders (including aggression and criminal behaviour). Children who had participated in

the enrichment program had lower scores for schizotypal personality and antisocial behaviour than the children in the control group. The program seemed to be particularly beneficial for children who had shown signs of malnutrition at age three.

Adrian Raine, one of the study’s lead researchers and the Robert G. Wright Professor of Psychology in the Department of Psychology at the University of Southern California, states that the study highlights the need to intervene early in childhood, but leaves unanswered which part or parts of the enrichment program had the greatest impact. *“It could be better nutrition, physical exercise, educational program, or it could be the package of all three. We don’t know. What the study does imply is that improving children’s physical and cognitive health leads to improved mental health and behaviour as adults. Building better brains leads to better behaviour,”* he says. In that case, Raine adds, *“Starting an intervention at age three may be too late. Maybe we should be starting even earlier.”*

THE EARLIER THE BETTER

Katherine Gray-Donald, Associate Professor and Director of the School of



Dietetics and Human Nutrition at McGill University, agrees that one of the study’s key findings is the positive impact of early intervention. *“This exciting new study provides strong evidence that a multi-faceted intervention in the early years can have a very long-lasting impact on aspects of psychological health,”* she says. However, more work is needed to determine the role nutrition played in improving the long-term mental health of the children. Gray-Donald points out that the Mauritian children were far more severely malnourished than children in Canada. *“While there are problems of micronutrient deficiencies in disadvantaged Canadian children, including anemia (iron deficiency), occasional cases of rickets (Vitamin D deficiency) and stunting (zinc deficiency), the magnitude of the problem is much less,”* she adds. Therefore, *“The significance of such programs in settings without serious malnutrition is not clear.”* 🦋



To learn more about Nutrition and Pregnancy, Breastfeeding and Eating Behaviour, see our experts’ papers in the online CEECD Encyclopedia:

www.excellence-earlychildhood.ca/encyclopedia

Ref.: Raine A, Mellingen K, Liu JH, Venables P, Mednick SA. Effects of environmental enrichment at ages 3-5 years on schizotypal personality and antisocial behavior at ages 17 and 23 years. *American Journal of Psychiatry* 2003;160(9):1627-1635.

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