

Adolescent Nutrition and Growth

Prior to watching the *Adolescent Nutrition and Growth* webinar, I did not realize that 90% of adolescents live in low and middle income (LMIC) countries.¹ This statistic stood out to me as I instantly thought about the double-burden of malnutrition epidemic that occurs amongst adolescents in LMIC countries. I understand the urgent need to directly reach these adolescents, their parents, their communities and their respective countries. Considering the political cuts to USAID and similar organizations, this is simply not something we can ignore as future RDs as malnutrition will have an impact on these young individuals for the entirety of their lives if not properly mitigated.

I agree with Dr. Murray that a lack of nutrition education is a factor that impacts adolescent nutrition. This is true not only in LMICs, but in high-income countries as well. This was an ongoing theme I instantly recognized when completing both my community and FSM rotations. This further underscores the importance of educating many in LMICs how to farm and create sustainable resources to help these populations eventually reach independence.

I was shocked to learn that 50% of adult weight, 20% of final height, and 40% of bone mass occur during adolescence.¹ This further shows *why* poor nutrition during adolescent years can impact an individual for their entire lives. This also caused me to reflect on the young female athletes who are in REDS. Nutrition education and nutrition care are essential for parents and children/adolescents/athletes/special healthcare needs, etc. I am a huge advocate for nutrition education as this is an effective way to educate children while they are young, their parents, etc.

I thought it was interesting that the webinar highlighted the *triple* burden of malnutrition. I've studied the double burden of malnutrition, and honestly the triple burden of malnutrition is

very similar with very small differences. Undernutrition, overnutrition and micronutrient insufficiencies such as folate, zinc, iron, iodine and Vitamin A fall under the triple burden of malnutrition in adolescence.¹ This, yet again, highlights the tragedy that's occurred as a result of budget cuts to USAID and similar agencies and programs. These programs actively work in LMICs to provide nutrition education, aid, and help/empower local communities by building sustainable food systems – all which are necessary to end the vicious cycle of the double burden (or triple burden in the context of this webinar) of malnutrition in these countries.

It was interesting to learn that 25% of daily energy is consumed as snacks. With proper nutrition education programs in place, we can teach adolescents how to choose and create healthier snack options (i.e. eating hummus with apple vs chips and soda), how to diversify their dietary pattern, and help them better understand the *why* behind consuming healthier snack options (i.e. decreased risk of T2DM, obesity, CVD in the future). It was interesting to learn that NHANES data showed that eggs, nuts and seeds, beans, peas legumes, dark green vegetables and vitamin A-rich fruits and vegetables were the least consumed amongst US adolescents between 2007-2018.¹ This is not surprising to me, but this data really helps us as nutrition professionals hone in on efficient nutrition education in this cohort.

One thing I had not considered was that male adolescents may have a more diversified diet due to the fact that, on average, they consume ~1000 kcal more than their female counterparts due to higher body and muscle mass.¹ This was interesting to hear and I'm not sure if this is something I would have thought about prior to watching this webinar. It was interesting to learn that male adolescents consume these extra kcals through meat, dairy and grains. It is still shocking to me that calcium, vitamin D, and potassium are nutrients of concern for all ages in all life stages.¹ These micronutrients can be consumed through dairy products, fortified foods, and

foods that contain these micronutrients. Spending ~20-minutes outside (and longer for darker skin pigments) can help with vitamin D generation – so why are these nutrients of concern? I know this will be an ongoing theme during this reflection – but *nutrition education* can help bridge the gap between knowledge and consumption. It was absolutely surreal to learn that almost 100% of the population does not reach their daily recommendations for vitamins D, E, potassium and choline.¹ Again, this underscores the importance of ongoing nutrition education.

It was very interesting to learn about the outcome of type 1 and type 2 nutrient deficiencies. In type 1 nutrient deficiencies, growth will continue early on and the clinical signs that may occur are found through lab testing. However, for type 2 nutrient deficiencies, there are no clinical signs, but growth failure occurs and diagnosis occurs via anthropometry.¹ This is why it is important for us, as future RDNs, to really understand and know what to look out for in the adolescent population.¹ This also furthers my belief that every pediatrician's office should have an RDN available for children and their parents.

It was important to be reminded that deficiencies in calcium, vitamin D, phosphorus, and protein will slow the growth plate – something we do not want in growing children and adolescents as this may negatively impact them for the entirety of their lives. Individual micronutrient deficiencies or decreased nutrient availability and intake at certain times or points in life (i.e. less food access due to a parent losing a job and/or an adolescent goes through a period of food insecurity), even without any overt signs (problems of linear growth, etc.) there is a slowing of the growth plate that can be improved with corrective nutrition. Growth signals are also impacted by decreased nutrient availability as IGF-1, thyroid, estrogens and androgens are also affected by diet quality – all of which impact the adolescent.¹ It was interesting to learn that both undernutrition and overnutrition have characteristics of inflammation for these nutritional

disorders.¹ It was shocking to learn that, as a result, inflammation and eventual glucocorticoid release will cause a problem with the growth plate.¹ In short, sufficient nutrition is needed for the ultimate optimal growth of adolescents – which again underscores my belief that every pediatrician office should have an RDN on staff.

Particularly in female adolescents, dietary calcium and vitamin D must be sufficient because if dietary intake of calcium is chronically low, calcium will be removed from bone pits in order to reach blood calcium homeostasis. This not only impacts the adolescent at that point of time in their life, when their bones should be growing and further developing, but also puts that adolescent at higher risk later in life for osteoporosis.¹ Prior to watching this lecture, I didn't think about how low dietary calcium and vitamin D during adolescent years can have a direct impact in the senior years – particularly amongst women.¹

I give nutrition education to youth athletes and explain to them that they *need* to consume breakfast to help build their glycogen stores. However, it was shocking to learn that >25% of teens skip breakfast and 25% skip breakfast intermittently.¹ However, the athletes I teach skip breakfast by choice whereas the statistic given in the webinar shows that teen breakfast skipping is associated with lower family income.¹ It is important for us, as future RDNs, to realize that fewer black and Hispanic teens consume breakfast as this is a demographic we can focus on when delivering nutrition education and explaining *why* consuming breakfast is important – but also encouraging those same teens and families to sign up for the free or reduced breakfast and lunch programs, SNAP, etc.

It was interesting to see an MRI of the brain showing that fasting impacts the mid-brain and puts the individual into “food seeking mode” – which is associated with the individual feeling distracted, irritable, restless and anxious.¹ In contrast, satiation is associated with the

front brain and puts the individual into *working mode*, which is associated with calm, focused, organized, and thoughtful traits. Nutrition education focusing around the *why* of eating breakfast may help an adolescent realize how eating breakfast will support them now and later in life. Additionally, diet diversity helps support brain function.

One thing I had not considered prior to watching this webinar is that improving female adolescent diet quality has an impact on child-bearing years and a positive impact on child outcomes. The maternal/child DYAD is not something I had heard of prior to this webinar, but it makes sense. Truly this is a full-circle moment as adolescent nutrition impacts child-bearing years and also impacts geriatric years. This is why proper nutrition and nutrition education is important as it is apparent that the nutritional choices an adolescent female makes will have a direct impact on her future health, such as the childbearing and geriatric years.¹

I've long believed this, but after watching this webinar it further confirms, each pediatrician's office should have an RD available to screen for malnutrition and to give nuanced nutrition education – not just basic “eat your fruits and vegetables” that we often hear from our pediatrician's during annual wellness or sick visits.

Adolescent Nutrition

It was very heartening to hear a pediatric gastroenterologist emphasize that adolescent nutrition and health is a clinician's "last chance" to influence adolescent behavior before they become adults and that the decisions they make may impact them for the rest of their lives.² The prevalence of malnutrition in children is 1 in 10, or 10%.² This is alarming as the data is clear that malnutrition in children may impact them negatively for the duration of their lives. On top of that, >14% of children with special healthcare needs (chronic healthcare need), such as IBD pediatric patients, are malnourished. As an IBD patient myself, I was glad to hear Dr. Corkins state that if a child with IBD presents as malnourished, it should *not be discounted* that the malnourishment is a result of their illness – it could also mean that their illness is due to the fact that they may come from a food-insecure household and that the malnourishment of this patient *should not be assumed nor accepted* simply as "2/2 IBD." Yes, this sounds silly to write but too often, pediatric MDs will not address the multifactorial causes of malnutrition and instead will say, "you're malnourished because you have a chronic medical condition." I truly liked that Dr. Corkins emphasized that malnutrition *must* be addressed and the *why* for each patient should be investigated and understood.

When speaking of "catch-up growth" in a malnourished adolescent, Dr. Corkins emphasized that first the disease process must be treated, if it is a social or economic issue (food insecurity, etc.) then proper interventions must be put in place. When puberty is over, the growth plate closes so it is extremely important to focus on adolescent nutrition and identify those who are malnourished, and emphasis must be placed on energy-dense, whole foods.

Dr. Corkins emphasized to fellow clinicians that they can have a direct impact on adolescent nutrition, though it would have been helpful if he spoke about the importance of the

RDN, as this is the subject matter expert who understands nuances and is the subject matter expert in this area. I liked how Dr. Corkins spoke of the importance of micronutrients such as vitamins A, D, C, K, B vitamins, iron, calcium, phosphorus and vitamin D, and emphasized that iron is especially important for adolescent females who have started menstruation.²

While Dr. Corkins was speaking about the sequential approach, all I kept thinking was *this is what we (RDNs and future RDNs) are trained on*. Yes, making changes one at a time are sustainable, but it is unrealistic to expect that MDs and other providers that *are not* RDNs will be able to provide this care in an appropriate manner. Simply put, other clinicians are not trained in nutrition the way we are. It is great for an MD to ask an adolescent how their diet is going, however, they are not set up for nutrition care – it is not their area of expertise nor do they have the time to do so. This again highlights the importance of pediatrician's offices having an on-site RDN to screen for malnutrition and also handle nutrition care.

It was disheartening to hear Dr. Corkin state that adolescent's look to "them" [medical doctors] for nutrition advice. Though I know this is technically true, it would have been better if Dr. Corkin pivoted and stated that this is why MDs refer to RDNs as the RDN is trained to best provide nutrition care to adolescents. MDs are *not* adequately trained in nutrition. I appreciate he is passionate about nutrition, but he should also recognize nutrition is not his area of expertise. I think it's important for a doctor to ask an adolescent how their appetite is and screen for food insecurity and malnutrition, but if there are any indicators that an adolescent may suffer from any of these issues – a referral to an RDN should occur, and sadly, there was not mention of an RDN in this specific webinar.

Strengthening the Hospital Community Connection

I think there may have been an error on ANHI's website as the video that was presented in the *Strengthening the Hospital Community Connection* webinar did not cover hospital community connection but instead spoke about the importance of adolescent nutrition. Therefore, I will speak about the video presented.

Dr. Murray stressed the importance of nutrition in childhood development, growth and long-term health. Dr. Murray also pointed out that potential health risks may occur if adequate nutrition does not occur. Sadly, poor nutrition in adolescents may impact that adolescent into adulthood and set them up for significant health risks in the future, from adulthood to older adulthood.

It was interesting to hear Dr. Murray speak of epigenetic environmental factors, which are nurturing relationships, safe and stimulating environments and diet quality.³ From conception through pregnancy, diet and nutrition directly impact the fetus. A pregnant mother should ensure she is consuming a balanced, diversified diet and is consuming enough energy, protein and micronutrients to support not only her nutrition and health, but the nutrition, health, and growth of the baby. Once the baby is born, breastfeeding is the ideal nutrition for an infant as breastmilk has a positive impact on child metabolism and is the ideal food for optimal growth.³

Dr. Murray emphasized that suboptimal nutrition can unravel "all potentials of the child." *Suboptimal nutrition can unravel all potentials of the child.* This is a powerful statement. This statement emphasizes the importance nutrition has on growth and development. As a child is growing, proper nutrition maintains optimal growth and development. As mentioned in his previous lecture, Dr. Murray spoke about the triple burden of malnutrition, which is wasting (low

weight for skeletal height), stunting (low height for age) and overweight/obesity (excess body mass [fat mass] for height).³ Everything is impacted – body and brain development, linear growth, metabolism, health, health risk, and ability to function in school as a child and even into their job as an adult. I liked how he highlighted that the primary care role is to identify children at risk for malnutrition and nutritional deficiencies, intervene aggressively, and to seek help from other professionals that can help solve the problem – however, RDNs again were not mentioned in this webinar.

Nutritional Counseling for Individuals with Disabilities

Prior to watching the webinar *Nutrition Counseling for Individuals with Disabilities*, I didn't realize that 26% (1 in 4) adults in the United States are living with some type of disability.⁴ I also didn't realize that disabilities are more likely to suffer from obesity, heart disease, diabetes, and smoke when compared to the non-disabled population.⁴

I was shocked to learn that in 2020-2021, 72,000 between the ages of 3-21 were receiving DHH services under the Individuals with Disabilities Education Act (IDEA).⁴ I had never considered how prevalent hearing loss was amongst children, adolescents, and young adults but was saddened to learn that depression and anxiety is higher in DHH children due to healthcare inequities largely caused by a lack of awareness from both providers and the child's own families.⁴

I used to think that pediatrician's and other pediatric healthcare providers would be equipped with tools to work with children with disabilities because, well, they're doctors that work with children. However, I now know this is not the case as they are doctors who are trained in medical issues and not necessarily all of the nuances associated with disability. I learned during this webinar that often times children with DHH suffer from notable healthcare inequities. I think it's important for DHH children to see a DHH dietitian (if possible) and other DHH providers if needed. I honestly never considered this prior to watching the webinar, but it makes sense. *Children and patients with disabilities need to feel seen and heard.*

It was very interesting to hear from Alicia Connor, who is a legally blind/low vision RD, that it took her 10-years to complete her higher education.

I was already familiar with invisible vs visible disabilities as I have IBD. IBD is considered an invisible disability. I am very open about my IBD diagnosis, but I do think it is helpful for others to hear Alicia Connor talk about how to address the “elephant in the room” and address the disability (i.e. For her to be able to read client notes she has to bring the notes very close to her eyes). She is empowering others with disabilities to not be ashamed nor hide from their disability and to instead embrace it and continue working through it (and be open about it with clients if appropriate).

After watching this webinar (and I often felt this way during my clinical rotation), though hospitals treat people with disabilities – they are not necessarily set up for, nor do fellow practitioners consider, how disabilities impact their fellow healthcare practitioners or interns. This should be trained and it is apparent there is a lack of sensitivity and care in this area – which is why it was heartening to watch this webinar and see that there are RDs and other healthcare providers actively working to change this thought process and landscape.

Overall, this webinar helped me realize how to accommodate *my practice* for future clients/patients with disabilities such as DHH, legally blind/low vision, spinal cord injury, etc. I now feel better prepared to offer accessible resources suitable for clients of varying disabilities and to also ask the client with a disability (if appropriate), “How do you best learn? How can I provide relevant nutrition education materials and information that would best suit you?”

Dairy Council Resources

I had previously completed a reflection on the *National Dairy Council & American Academy of Pediatrics* child feeding resource *Airplane Choo Choo*. This was completed March 26, 2024. This resources was quite interesting so I was eager to explore and learn about the *Dairy Council* resources needed to write this reflection.

I quickly learned that the *Dairy Council* resources are a goldmine of information and very important not only for those who are thinking about conceiving, but for those who already have children. They are also important resources for future RDNs, whether they have children or not, as this is truly a “one stop shop” or “cliff notes” version for the importance of nutrition and how it impacts an individual throughout the lifecycle.

Looking back, I wish these resources were available to me in 2013-2014, before I was pregnant, while I was pregnant, and after I had my first child (and second for that matter). I did not know that optimal nutrition during pregnancy, infancy and early childhood offers health benefits that can last a lifetime.⁵ Unfortunately, I was caught in the holistic health space and believed that “dairy is inflammatory” and “dairy is bad.” I did not allow my daughter to consume dairy products until she was close to 5 years old because I mistakenly thought it was “bad” for her.

Had these resources been available to me, I’m not sure if it would have changed my mind as I was quite brainwashed at the time. However, I do know these resources would have *planted the seed*. Maybe they would have changed my mind, I’ll never know. I appreciate that several important topics are covered in the dairy council resources – from school nutrition’s impact on health and education performance, to healthy snacks, to tackling *why* breakfast should be

consumed in the mornings.⁵ These are all very important topics that are presented in a very easy-to-understand way for children and adults alike.

I especially liked the “resources and research summaries” that were presented on the *Pregnancy Nutrition* portion of the *Dairy Council of California* website as it is both interesting and helps give a “full picture” of where recommendations and outcomes are coming from. While reading through these resources and research summaries, I envisioned how I could create nutrition education material from it as it contains so much great information. What stood out to me the most is that future RDNs should read these research summaries as it answers and debunks many of the material that is presented in the “holistic health community” today – such as *why* dairy is an important part of human nutrition, the role it plays from a nutritional standpoint, and how growth and development is supported through the consumption of dairy products.

Overall, these dairy council resources, whether they be for older adults, for women prior to pregnancy, during pregnancy, infancy, childhood, adolescents, adulthood, etc – are important and do a great job explaining how adequate nutrition provides much needed micronutrients and macronutrients. I definitely know I would recommend “Child and Teen Nutrition” to parents as the “Ask a Nutritionist” videos tackle relevant topics and will help parents better understand child and teen nutrition and the impact adequate nutrition has on overall health and wellness. These videos provide great “tips and tricks” on how to get your child to eat healthier meals, what the parent can do to model healthy food behavior, and also the *why* and importance of eating breakfast and school meals to support child growth and development.

In the future, if I work with clients who are thinking about becoming pregnant or are pregnant/have an infant, I will absolutely recommend the “Pregnancy Nutrition” section of the

Dairy Council website as it really does explain to new parents *why* nutrition during pregnancy and beyond is very important – both in the short and long term.

I am thankful to have learned about these resources as they truly are a “one stop shop” for pregnancy, early childhood, childhood, adolescent, teen, adult and older adult nutrition! This definitely will not be the last time I read or refer back to these resources.

Previously Completed Modules

Child and Adult Meal Pattern Requirements:	Completed March 27, 2024
Community Health Lectures:	Completed March 26, 2024
WIC Modules:	All modules completed March 27, 2024
Infant Meal Pattern Requirements:	Completed March 27, 2024
Nutrition for Children with Special Healthcare Needs:	Completed March 13, 2024

References

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2. Corkins M. Adolescent Nutrition: An Often Neglected Health Topic webinar. Abbot Nutrition Health Institute. April 1, 2021. Accessed September 30, 2025. <https://www.anhi.org/resources/videos/corkins-adolescent-nutrition-neglect.html>
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