Nutrition in adolescence: Multiple challenges, lifelong consequences and the foundation for adult health

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Around the world, there are an estimated 1.2 billion adolescents between 10 and 19 years old. Although adolescence lies between childhood and

adulthood, adolescents are neither big children, nor little adults. They have increased food requirements to support their rapid physical growth and maturation.

The steep increase in issues such as anemia, overweight and obesity in this age group puts nutritional issues among the greatest immediate threats to adolescent health. Exposure to healthy nutrition from adolescence—ranging from actual food consumption to the food environment—can set the stage for a healthy life ahead and good dietary habits.

The combined factors that shape diet can include personal factors, such as taste preferences and knowledge of healthy foods; social influences like friends, families and co-workers; and physical surroundings, including stores and advertising.

However, poverty and socio-economic inequalities remain important barriers to accessing diverse and nutritious foods. Supporting adolescents' health and well-being is necessary to ensure their healthy development, but also offers lifelong and intergenerational benefits.

From a lifelong perspective, healthy eating behaviors adopted during adolescence, such as how much and what you eat, are more likely to continue into adulthood. Intergenerationally, things like adolescent pregnancy can negatively affect a girl's growth, and can also impact fetal growth and development.

Forms of malnutrition in adolescents

Adolescents face forms of malnutrition on both ends of the spectrum, from being underweight and having micronutrient deficiencies, to being overweight and obesity.

On the undernutrition side, an estimated one in four adolescents experience anemia, a condition where someone does not have enough healthy red blood cells to carry adequate oxygen to their body's tissues. Linked to limited intake of required vitamins and minerals or malabsorption from the gut, anemia can complicate growth and development.

Anemia can also decrease productivity, which is particularly important considering most adolescents go to school and/or work. The number of adolescents who experience undernutrition is disproportionately higher in low- and middle-income countries.

From an over-nutrition perspective, one in five adolescents is overweight or obese, and the proportion is increasing worldwide. These conditions are associated with a greater risk of developing a disease such as diabetes or cancer later in life, as well as chronic health issues such as hypertension.

Making nutritious food choices

Eating a balanced and diverse diet is key to meeting nutritional needs. Making good food choices is complicated by adolescents' affinity for unhealthy foods, such as high-energy and ultra-processed foods like sugar-sweetened drinks and fast food. Compared to children, they have a greater say in what they eat, when and where they eat it, and can be increasingly influenced by social pressures.

Food environments are shaped by food availability, affordability, promotion, quality and safety. They impact food choices and are an important factor in what adolescents eat. Adolescents can face multiple food environments daily between the different settings they encounter such as home, school and workplace.

Food environments can be classified into three categories:

- Traditional: Limited food availability and accessibility, adolescent food autonomy is restricted.
- Mixed: Greater food availability and affordability, food autonomy is increased, role for social significance of food and advertising.
- Modern: No concerns about food access, food autonomy is common, influenced by peers and advertising.

In resource-limited settings, found in both high- and low-income countries, poverty is a key factor driving nutritional inequalities —particularly micronutrient deficiencies. With the COVID-19 pandemic, economically vulnerable households worldwide have experienced increased food challenges and food insecurity. This presents yet another challenge to adolescent nutrition.

With colleagues in Pakistan, my research looked at social determinants of nutrition among late adolescent girls. One way we did this was using a diet scoring tool to assess the diversity of the food they ate. We found that the adolescent girls ate micronutrient-poor foods most of the time, and they commonly had highly sweetened tea, desserts and fried snacks.

We investigated the roles of different factors thought to affect adolescent nutrition, including education level, food insecurity, self-efficacy and decision-making autonomy. We found poverty was the most important factor predicting a limited diet. In this traditional food environment, addressing adolescent girls' dietary quality will require two components:

1. Strategies to reduce poverty to deal with the resource constraints that prevented them from accessing diverse and nutritious foods. These include social safety net programs such as cash transfers.

2. Micronutrient intake strategies such as supplements and fortified foods.

Interventions to improve adolescent nutrition

The World Health Organization recognizes several evidence-informed interventions to improve nutrition during adolescence. These range from education to supplements, and vary depending on the setting, context and type of malnutrition.

For example, a nutrition intervention targeting adolescents in Canada would look different from one in Pakistan. However, interventions within either Canada or Pakistan could also differ, depending on geography (urban or rural) and resources. In settings with socio-economic barriers such as income and education, these must be addressed; intervening at the individual level alone does not get at the root cause of malnutrition.

A recent international study looked at the interventions in different countries to improve adolescents' food and nutrition environments and increase their ability to make choices about their nutrition. It showed a need for more data and research, and saw a role for engaging adolescents to generate solutions. But the greatest reach may come from establishing collaborations across multiple sectors. This means extending beyond the usual players in health and nutrition to engage those in education, food production and marketing (including social media), and agriculture.

Today's adolescents face multiple threats to their nutrition. Accessing a healthy and safe diet is a basic need, yet nutritional inequalities are on the rise between and within countries. Addressing underlying inequalities and providing appropriate nutrition interventions for adolescents offer a long-term positive impact on their lives.