FOOD CONSUMPTION AND LIFESTYLE TRENDS

The adoption of healthy lifestyle behaviors is programmed from an early age and extends into adolescence and young adulthood. Despite the importance of modifiable healthy dietary and lifestyle practices in mitigating noncommunicable diseases, there exists a limited understanding of population-level changes and current trends in food consumption and lifestyle behaviors in these populations. Understanding such trends is critical to inform public health guidelines on effective health promotion approaches across the lifespan.

Infancy and early childhood are critical periods for the development of taste preferences and dietary patterns. *Duffy et al.* examined trends in food consumption patterns in 2002, 2008, and 2016 among infants. Within age groups, the authors found a significantly positive increase in breast milk consumption and a significant decrease in the consumption of sweets, sugar-sweetened beverages, 100% fruit juice, and infant cereal. In addition, they observed a significant stagnant or decreased consumption in whole grains and stagnant consumption of vegetables.

Similar to infancy and early childhood, several behaviors are further developed and strengthened during adolescence. Yet, adolescents often undergo a number of physical, behavioral, and psychosocial changes that may challenge the prioritization of a complex set of healthy behaviors. *Marques et al.* developed a composite measure of a healthy lifestyle to examine associations with sociodemographic factors in adolescents. The authors found that only 1.9% and 4.2% of adolescents achieved,

respectively, all or none of the five behaviors of interest (≥60 minutes of physical activity per day, daily consumption of fruit and vegetables, <2 hours of screen time per day, and abstinence from alcohol and from tobacco).

Following adolescence, transitional changes in young adulthood may lead to shifts in already established lifestyle behaviors, which emphasizes the importance of continually and actively promoting a healthy lifestyle during this period, including vegetable consumption. The recent review of *Rodrigues et al.* identified levels and predictors of consumption of vegetables among young adults during their college/university years. Most college students did not adhere to World Health Organization guidelines for vegetable consumption, with approximately only a third achieving the recommendation. Predictors for higher intake of vegetables included being female, among a number of other factors.

The frequent poor dietary and lifestyle behaviors across childhood, adolescence, and young adulthood are among the key factors contributing to a weight gain trajectory and increased risk of noncommunicable diseases, such as heart disease, cancers, and type 2 diabetes. Future public policy efforts may focus on targeting vulnerable subgroups that may be most at risk for a lack of adherence and tailoring health promotion strategies for these subgroups and diverse lifestyle areas.

Maryam Kebbe
Postdoctoral Researcher
Pennington Biomedical Research Center - USA

Illustrations, photographs: © Shutterstock

Trends in food consumption patterns of US infants and toddlers from Feeding Infants and Toddlers Studies (FITS) in 2002, 2008, 2016

Thierry Gibault

Nutritionist, endrocrinologist, Paris - FRANCE

Early childhood is a critical period for the development of taste preferences and eating habits, with early eating behaviours establishing future dietary patterns. Knowledge of dietary trends among infants and young children in the United States can provide insights for programmes to improve infant and child health, yet there are limited data on consumption patterns for this age group.

A total of 5,963 infants and toddlers from 6 to 24 months of age

The Feeding Infants and Toddlers Study (FITS) is the largest dietary intake survey focused on infants and young children in the United States. Its objective is to assess trends in food and beverage consumption among children aged from 6 to 24 months, based on the FITS surveys conducted in 2002, 2008 and 2016, and the changes over these three survey periods in the past 15 years.

A total of 5,963 infants and young children aged from 6 to 24 months were included in the analyses.

Telephone interviews were conducted with each child's caregiver. Questionnaires were also used to assess household demographics, child characteristics, dietary practices and behaviours, with separate questionnaires for infants and young children under 24 months, and for children aged 24 months and older.

Milk and milk products consumption

Breastfed infants and toddlers aged from 6 to 12 months, from 12 to 18 months or from 18 to 24 months consumed 600 ml, 89 ml or 59 ml of breast milk respectively.

All of them consumed milk or milk products (including breast milk and/or infant formula) during the three survey years. Those aged from 6 to 12 months consumed an average of 755 g of milk and milk products, with 10% of them consuming cow's milk.

This prevalence remained stable over the three survey years. Among infants aged from 12 to 24 months, 99% consumed milk and milk products. Cow's milk, infant formula and cheese were the most frequently consumed. The percentage of infants aged from 12 to 24 months consuming cow's milk did not change over the three survey years: 85% consumed it on the day of the survey.

Grain and grain products consumption

The percentage of infants aged from 6 to 12 months consuming grains or grain products decreased over the three survey years with an average consumption of 44 g of infant cereal. The percentage of infants consuming grain-based baby finger foods increased (from 6.7% to 33%).

There was no change in the percentage of infants aged from 12 to 24 months consuming grains or grain products (96%), nor in the grams per capita.

An increase in the amount of whole fruit consumed

The percentage of infants aged from 6 to 12 months consuming fruits (including 100% fruit juice) fell slightly, but the number of grams consumed per capita decreased significantly. There was a decline in the percentage of infants aged from 6 to 12 months consuming 100% fruit juice, as well as in the amount consumed.

The percentage of fruit consumption remained stable at around 74%.

Among infants aged from 12 to 24 months, there was also a significant decrease in the percentage consuming 100% fruit juice and in the amount consumed. The amount of whole fruit consumed increased significantly, while the percentage of children consuming whole fruit increased slightly in 2016.

Changes for vegetable consumption were not significant

While the percentage of infants aged from 6 to 12 months consuming any vegetables increased slightly, the change was not significant. Between 28% and 33% of infants did not consume any vegetables on the day of the survey. Baby-food vegetables were the most common type in all three surveys (44% on average). Non baby-food vegetables accounted for about 20% of total consumption.

The percentage of infants aged from 12 to 24 months consuming vegetables and the amount consumed did not change significantly. Between 21% and 28% did not eat any vegetables on the day of the survey.

What about meat, other proteins and sweet foods?

There was a significant increase in the percentage of infants aged from 6 to 12 months consuming meat or other protein foods. Among those aged from12 to 24 months, the percentage of children consuming meat or protein foods did not change (83%), but the amount consumed increased significantly.

Among both 6–12-month-olds and 12–24-month-olds, there was a decrease in the percentage consuming sweets, sweetened beverages and desserts, as well as in the amount consumed.

Promising improvements but more efforts needed!

Positive significant findings include increases in the consumption of breast milk and whole fruits, and decreases in the consumption of sweets, sugar-sweetened beverages and 100% fruit juice. More troubling findings include a decrease in infant cereal consumption, stagnant or decreasing whole grain consumption, and stagnant consumption of vegetables. While our findings show some promising improvements in consumption among infants and toddlers in the US over the past 15 years, further policy, programmatic and industry efforts are still needed.

The Global
Fruit & Veg Newsletter

A composite measure of a healthy lifestyle for adolescents

Adilson Marques and Margarida Gaspar de Matos

Faculdade de Motricidade Humana, Universidade de Lisboa - PORTUGAL

The practice of physical activity, less time spent in sedentary behaviours, healthy diet and absence of alcohol and tobacco consumption are considered health behaviours[1]. Studies of adolescents' health behaviour have focused on the relationship between a health outcome and the individuals' behaviour. However, studies that combine health behaviours, to create a healthy lifestyle measure, are sparse. A healthy lifestyle measure could be important to influence public health policies, where measures should be considered to develop health promotion and adhesion to healthy lifestyles. Therefore, we explored how a composite healthy lifestyle index could be achieved and examined its relationship with the sociodemographic factors.

Healthy lifestyle composite measure

The study was conducted with the HBSC* 2014 international database. The sample consisted of 167,021 adolescents (80,558 boys, 86,463 girls), aged 10-16 years, from 38 countries. Data were self-reported. The healthy lifestyle score was created by combining the 5 healthy behaviours (daily physical activity, daily consumption of fruit and vegetables, spent <2 hours/day in screen-based behaviours, never drinks, never smoke), as used in a previous studies[2]. The healthy lifestyle score ranged from 0 to 5 and 5 represented a healthy lifestyle.

Prevalence of having a healthy lifestyle

Only 1.9% of adolescents had a healthy lifestyle, achieving all five healthy behaviours. In contrast, 4.2% reported none of the healthy behaviours (cf. table 1).

Table 1. Healthy behaviours prevalence.

Healthy lifestyle behaviour	% (95% confidence interval)
Physical activity every day	19.6 (19.4, 19.8)
Screen time < 2 hours/day	26.3 (26.1, 26.5)
Eat fruits/vegetable every day	23.4 (23.2, 23.6)
Not drink	61.1 (60.8, 61.3)
Not smoke	92.1 (92.0, 92.3)
Number of behaviours reported	
None	4.2 (3.7, 4.6)
1 behaviour	19.9 (19.5, 20.3)
2 behaviour	38.6 (38.3, 39.0)
3 behaviour	25.7 (25.3, 26.1)
4 behaviour	9.7 (9.2, 10.2)
5 behaviour	1.9 (1.4, 2.3)

Engaging in daily physical activity, spending ≤2 daily/day involved with screen-time behaviour, and daily consumption of fruit and vegetables are the behaviours that offer the best possibilities to improve the composite measure to have a healthy lifestyle. On the other hand, most adolescents did not report drinking or smoking.

The mean of the achieved healthy behaviours varied from 1.9 (95% CI: 1.9, 1.9) for Bulgaria and Romania to 2.7 (95% CI: 2.7, 2.7) for Iceland (cf. table 2).

Table 2. Prevalence of healthy lifestyle behaviours by countries

Countries	Mean (95% CI) healthy lifestyle behaviors	Countries	Mean (95% CI) healthy lifestyle behaviors
Albania	2.2 (2.2, 2.2)	Luxembourg	2.4 (2.4, 2.4)
Austria	2.3 (2.3, 2.4)	Malta	2.0 (2.0, 2.1)
Armenia	2.2 (2.2, 2.7)	Moldova	2.0 (2.0, 2.1)
Belgium	2.2 (2.1, 2.2)	Netherlands	2.2 (2.2, 2.2)
Bulgaria	1.9 (1.9, 1.9)	Norway	2.5 (2.4, 2.6)
Canada	2.4 (2.4, 2.4)	Poland	2.2 (2.2, 2.2)
Croatia	2.1 (2.1, 2.1)	Portugal	2.3 (2.3, 2.3)
Czech Republic	2.0 (2.0, 2.0)	Romania	1.9 (1.9, 2.0)
Denmark	2.2 (2.2, 2.3)	Russia	2.3 (2.3, 2.3)
Estonia	2.1 (2.1, 2.2)	Slovakia	2.0 (2.0, 2.0)
France	2.1 (2.1, 2.2)	Slovenia	2.2 (2.1, 2.2)
Germany	2.1 (2.1, 2.2)	Spain	2.2 (2.2, 2.3)
Greece	2.0 (1.9, 2.0)	Sweden	2.2 (2.2, 2.3)
Hungary	2.1 (2.1, 2.2)	Switzerland	2.5 (2.5, 2.6)
Iceland	2.7 (2.7, 2.7)	Macedonia	2.4 (2.4, 2.5)
Ireland	2.6 (2.5, 2.6)	England	2.2 (2.2, 2.3)
Israel	2.3 (2.2, 2.3)	Scotland	2.2 (2.1, 2.2)
Italy	2.0 (1.9, 2.0)	Wales	2.1 (2.0, 2.1)
Latvia	2.1 (2.1, 2.1)		

Less than 2% of adolescents can be classified as having a healthy lifestyle

Those responsible for setting and implementing programs to promote health amongst adolescents should review how this should be done. Considering the clustering of programs that encompass more than one known health-promoting factor may present a way forward. Measure components examination can help explain demographic differences and identify strategies for improving and for planning intervention programs. Results convey an important message for the promotion of youth friendly public policies namely in the area of education and health.

* Health Behaviour in School-aged Children

References

1. Rayner M *et al.* An introduction to prevention of non-communicable diseases. Oxford: Oxford University Press; 2017.

2. Marques A *et al.* Self-rated health and health-related quality of life are related with adolescents' healthy lifestyle. Public Health. 2019;170:89-94.

Vegetable consumption and factors associated with increased intake among college students

Vanessa Mello Rodrigues

Nutrition Department, Federal University of Santa Catarina - BRAZIL

Young adults are considered a key population because during this period, several behaviors are established. They are also in a transitional stage-of-life: leaving the family home, commencing college, entering the workforce, partnering, becoming a parent, etc[1]. According to a review published in 2017, most college students have unhealthy eating behaviors with high intake of fast foods, snacks, sweets, soft drinks and alcoholic beverages, and low intake of fruits, vegetables, fish, whole grains and legumes[2]. These poor dietary behaviors are among the main contributors to noncommunicable diseases (NCDs) such as cardiovascular diseases, cancers and type 2 diabetes[3]. Yet, the World Health Organization (WHO) considers that an intake of ≥400 g of fruit and vegetables per day could reduce the risk of developing NCDs[4].

This review aims to identify and summarize previously published research between January 2009 and October 2018 on vegetable consumption (71 articles) among 65,971 college students (69.8% female, mean age: 21.6 years old) from more than 155 different colleges in 30 countries from Africa, Asia, Europe, North and South America and Oceania.

One portion of vegetable per day was the most common frequency of intake

Studies which presented vegetable consumption by frequency of portion/servings consumed indicated that the most common frequency of intake was 1 portion of vegetable per day, achieved by 51.6% of Iranian students, 44% of Indian students and 35.8% of Chilean.

The only studies where the average reached 2 or more servings per day were in New Zealand and Canada.

Only 35.4% achieved relevant recommended vegetable intake

The majority of students do not consume the amount of vegetables recommended by the WHO nor in sufficient quantities to satisfy other relevant guidelines. The median frequency of participants who achieved relevant recommended vegetable intake was 35.4% but varied widely:

- Lowest frequency

  · South Africa → only 2.5% of participants met the USDA Food Guide Pyramid recommendation of 3 portions of vegetables/day;

  · Two studies in the USA → 7% and 12.4% of the participants met the MyPyramid recommendation of 2.5 cups of vegetables/day.

- Highest frequency

  · The Netherlands → 74% of fourth-year students consumed 150 g of vegetables/day as recommended by the Netherlands Guidelines for a Healthy Diet;

  · Finland → 68.4% consumed salad/raw vegetable and 28.6% consumed cooked vegetables daily or several times a day as recommended by the WHO dietary guidelines.

Factors associated with higher frequency of vegetable intake

No consumption patterns according to country or region were apparent. The main predictor of a higher intake of vegetables is being female. In addition to this, the following factors were also associated with a higher frequency of vegetable consumption:

- Normal weight
- Living in the family home
- Greater perception of happiness and less pressure and stress
- Lower BMI and blood pressure
- Importance given for healthy eating
- Nutrition knowledge
- Higher socioeconomic level
- Later stage of study
- More openness to new experiences
- Having breakfast
- Lower energy-density diet
- Being more active and drinking less alcohol.

Innovative public policies and new strategies to encourage vegetable consumption among college students are required, especially those targeting subgroups with lower intakes, such as males and those living outside family home. Recommendations for a healthy but also a sustainable diet are based on vegetable consumption. Therefore, positive eating patterns are important to promote positive health outcomes and global sustainability.

References

1. Stok FM et al. Understanding Eating Behavior during the Transition from Adolescence to Young Adulthood: A Literature Review and Perspective on Future Research Directions. Nutrients 2018,10, 667.

2. Bernardo GL et al. Food intake of university students. Rev. Nutr. 2017, 30, 847–865.

3. Hutchesson MJ et al. Health interventions for the prevention and treatment of overweight and obesity in adults: A systematic review with meta-analysis. Obes. Rev.2015,16, 376–392.

4. World Health Organization. Fact sheets. In Noncommunicable Diseases, 1st ed.; World Health Organization: Geneva, Switzerland, 2018