Hidden truths: Dispelling nutrition myths in an over-informed world

Gabriella Heruc
BBSc, BS(Phys-Hons), MNutrDiet, APD
ANZADE, Sydney Children’s Hospital Network, University of Adelaide & Appetite for Change
gheruc@appetiteforchange.com.au

Definition of confusion (Oxford)

1. Uncertainty about what is happening, intended, or required.
   i. A situation of panic or disorder
   ii. A disorderly jumble
2. The state of being bewildered or unclear in one’s mind about something.
   i. The mistaking of one person or thing for another.

Consumer confusion

IFIC 2012:
- 3 out of 4 consumers feel that changes in nutritional guidance makes it hard to know what to believe
- Half believe it is easier to do their own taxes than to figure out how to eat healthfully

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**Nutrition public health messages**

• "Well, they seem to change their mind all the time... First it's all about not eating fat, then they tell you some fats are ok, others are not. Ok, so then you have to try and figure out which fats are good, which are bad, and how much fat you can eat! Then it's sugar. So now you have to look at how much sugar the food has. Then it's fibre, so it's time to start seeing how much fibre food has.... So does that mean you have to look at fat, sugar, and fibre together?"

(Cornish & Moras, 2015)

**What do ED clinicians know?**

• 65 clinicians in UK (dietitians, nurses, clinical psychologists, psychiatrists) working with EDs and a group of 23 non-clinicians (lay group)
• Completed a standardised measure of knowledge of nutritional content of foods
• Dietitians had the highest level of knowledge regarding carbohydrate, protein & fat
• Psychiatrists were next best informed
• Clinical psychologists and nurses were no better than the lay group
• Links between nutrition knowledge level and clinician’s own eating attitudes (Cordery & Waller, 2006)

**Debunking Myths**

• A nutrition myth may have circulated for years, passed from person to person. To displace a myth, you have to create a credible replacement.
• Think about all of the influences on your own food beliefs
• We create our own patterns of eating influenced by our family/peers/environment etc.
• In an ED these become food rules which are driven by emotions and negative reinforcement

**Question: What is ‘normal healthy’ eating?**

Engages in dietary restraint
Monitors caloric intake
Avoids high fat food
Has fairly low carbohydrate intake
Has minimal salt intake
Drinks at least 2L water per day
Has high protein intake
Takes a daily multivitamin

OR

Has a balanced diet
Has lots of dietary variety
Listens to and trusts body
Eats when hungry, stops when full
Eats what is wanted, when it is wanted
Respectful of taste preferences

**What does a ‘normal healthy’ eater look like?**

**Advertising & media messages**

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So is this what we should all be following?

Myth 1: You need to follow the AGHE

- It was developed to be broadly used at a population level, not for individuals
- It cannot account for an individual’s nutritional needs
  - E.g. whether they have diabetes, coeliac disease, cystic fibrosis, etc.
- And yet, everyone thinks this is what they are meant to be following!
- So, consider how patients with eating disorders might interpret it . . .
- It certainly does not target their health concerns and needs
  - i.e. malnutrition, poor bone health, food anxiety

Use fats and oils in small amounts

Eat plenty of vegetables of different types & colours

Choose reduced fat dairy products

Choose lean meats

Drink plenty of water & limit drinks containing added sugar
  - (soft drink, juice, cordial)

Limit foods containing saturated fat, added salt & added sugars

Choose mostly wholegrain/high fibre carbs

Avoid carbs

Excessive water and low calorie fluids

Over consume high fibre foods, fruits & vegetables at the expense of other food groups

Limit dairy foods & choose skim options

Swap to products with “health halo”

Total avoidance of “extra’s” & fun foods

Avoid red meat & choose vegetarianism & veganism

Eliminate fats, compromising Essential Fatty Acids, Fat soluble vitamins

McMaster & Hart, 2018

Myth 2: You don’t need carbs at every meal

Carbohydrate is the essential macronutrient we use as fuel

- Keeps metabolic processes in a well-nourished, not starved state
- Brain relies on glucose as the sole fuel source
- It keeps you feeling satisfied and nourished, rather than deprived
- It is also the essential fuel for all ‘work’ done in the body
  - Muscle repair
  - Cell building
  - Metabolic processes, etc.
- Carbohydrates provide our main source of fibre
  - Missing them at one meal can make a big impact on bowel health

Myth 3: Some carbs are better than others

We all know added sugar is bad, fructose is terrible and we should be aiming for low glycaemic index foods, right?

- Sweet potato is better than white potato
- Added white sugar is bad
- Avoid/limit those of perceived lower value
- It is often believed we should avoid those of perceived lower value

Carbohydrates are all carbohydrates!

Myth 3: Some carbs are better than others (cont.)

“High fructose is bad”

- Although there is some evidence that excessive fructose can contribute to metabolic complications (insulin resistance, fatty liver, etc), too much of anything can be harmful
- More RCTs are needed

“High glycaemic index foods are bad”

- The quantity of carbohydrate always has a bigger effect on blood glucose than the quality
- Primarily a concern for those with insulin resistance or Type 2 diabetes
- Really it’s the glycaemic load that is important
  - Glycaemic load = GI x carbohydrate(g) content per portion ÷ 100
  - Or the total glycaemic load of a mixed meal

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**Myth 4: A high protein diet is healthier**

*The jury is out on high protein diets*

- Although protein stimulates satiety hormones (e.g. CCK, PYY), fat does even more!
- Some initial evidence that high protein diets in combination with high intensity resistance training may increase lean muscle mass in athletes
  - But may be at the expense of other macronutrient benefits
- In fact high protein, low carbohydrate diets have been linked to increased mortality rates ([Lagiou 2007 J Internal Med.])

**Myth 5: A plant-based diet is healthier than an animal-based diet**

*Plant-based diets may have a detrimental effect on diet quality*

- Every individual has their own health concerns and needs
- In clinical practice, people often struggle to maintain iron levels on a vegetarian diet
- Nutritional balance is also often poor with inadequate consumption of protein, iron, B12, zinc, Mg, omega-3 ([Turner et al, 2014, J Nutr Health Sci])
- Vegetarians consume inadequate iron, B12, protein and zinc (NHANES study, Farmer 2014, AECN)


- Prospective study of 30,253 participants
- Vegans had lowest energy intakes of all diets
- High prevalence of B12 and iodine inadequacy in vegans

**Myth 5: A plant-based diet is healthier than an animal-based diet**


- Diet modelling from NHANES study - girls 12-19yo
- Increasing plant-based food consumption by 100% increased fibre, sugar, vitamin E, Fe and folate, but decreased total fat, Zn, Vit D, Ca and protein
- Increasing protein-rich plant foods by 100% made little difference, as inadequately consumed
- Increasing dairy foods by 100% increased Vit D, Mg, Zn, Ca, K, energy, sat fat and protein


- Both vegetarian and diets including small amounts of red meat have been associated with reduced risk of heart disease and T2DM.
- There is limited evidence that a vegetarian diet prevents cancer

**Myth 6: Gluten could be the cause of your gut issues**

*In patients with EDs, it is more likely malnutrition and anxiety that are associated with gut issues*

- Gluten is a problem for ~0.5-1% of the population (e.g. those with coeliac disease)
- Often gluten is to blame when malabsorption of fermentable sugars (i.e. FODMAPs) is the cause of the gut issues
- Increased prevalence of GI symptoms in AN improves with refeeding


- Gluten consumption has been linked to lower risk of Type 2 DM
- Moreover, gluten consumption has been linked to reduced risk of Type 2 DM

[Benini et al (2004); Perez et al (2013); Heruc et al (2018)]

**Myth 7: Some foods are good, some foods are bad**

*Foods are not intrinsically ‘good’ or ‘bad’*

- These are values formed from media messages, family habits and personal beliefs
- No food is good or bad for everyone
  - Everyone has different nutritional needs, e.g.
    - A person with cystic fibrosis needs salt
    - A person with diabetes needs carbohydrates regularly
    - A person with inflammatory bowel disease might need a low fibre diet at times, and a high fibre diet another times
    - A person with haemochromatosis might need reduced red meat consumption
    - A person with iron deficiency anaemia might need more red meat consumption

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Myth 8: Fun foods are not everyday foods

- Chocolate
- Soft Drink
- Potato/Corn Chips
- Lollies
- Cake
- Pastry/Baked Goods
- Biscuits
- Pizza
- Takeaway food
- Hamburger
- Ice cream
- Dessert
- Hot chips
- Mints

Myth 9: Full fat dairy is bad for you

“Full fat dairy increases the risk of heart disease!”

Full fat dairy does not increase the risk of heart disease

- Meta-analysis combining data from 29 prospective cohort studies
- High fat dairy intake was not associated with risk of all-cause mortality, coronary heart disease or cardiovascular disease
- Dairy (whether high fat or low fat) has a neutral effect on cardiovascular risk

Myth 9: Full fat dairy is bad for you (cont.)

“It could be contributing to your high mucous production”

Cow’s milk does not lead to mucous production or asthma

- Perceived changes in mucous production in both cow’s milk AND soy milk
- Not increased in those with a common cold virus
- Milk consumption does not exacerbate asthma symptoms

Myth 9: Full fat dairy is bad for you (cont.)

“The fat is upsetting your stomach”

It is more likely that a patient’s stomach is upset due to malnutrition and impaired gut function

- Perceived changes in stomach function in both full strength and low fat milk
- Slower gastric emptying & more GI symptoms in starved patients
- After nutritional rehabilitation, all improved

- Slower gastric emptying & more GI symptoms in starved patients
- After 2 weeks of refeeding, gastric emptying improved, but GI symptoms did not

Myth 9: Full fat dairy is bad for you (cont.)

“You can still gain weight without it”

It is very difficult for underweight patients to meet their nutrition requirements for weight gain without full fat dairy

Clinical practice and food modelling, Hart & McMaster (2018)
- Almost impossible to achieve 30% energy intake from fat if drinking low fat milk.
- Patients prefer full strength rather than a larger serve of low fat milk.

Myth 10: Calcium tablets & oral contraceptives will improve bone density

- Research indicates that calcium supplementation does little to restore bone density or prevent further deterioration
- Other treatments have marked disadvantages
- Bone density is best (probably) restored & protected by resuming to a healthy weight where normal sex hormone profiles and normal fertility function are resumed

- Oral hormone replacement may prevent further deterioration, but does not reliably restore bone density
- May also mask resumption of menses
- There is some initial evidence of benefit from transdermal estrogen and bisphosphonates (with caution in young women)
**Myth 11: You should have 8 cups of water a day**

Drink when you’re thirsty, drink more when you sweat more — your body will take care of itself

- Everything you eat contains some water and raw fruit and veg have a lot
  - Diet can account for 20% of fluid intake
- Non-alcoholic drinks (tea, milk, juice, etc) mostly contain water and contribute to hydration
- Caffeinated drinks do not dehydrate, and also contributes to fluid intake
- But there is no firm science to support any recommendation
- Fluid needs depend on age, weight, physical activity, health and climate
- The best guidance comes from within — the body feels thirsty with declining hydration
  - Urine can also be a guide: dark yellow indicates dehydration, well hydrated is pale yellow

**Case study**

- Heidi was a small baby, but health professionals did not express concern
- Peanut allergy diagnosed at 2yo
- Became increasingly selective with eating, and avoided many foods
- Struggled to put on weight, and by 10yo was shorter than most of her peers
  - Health professionals still did not express concern to the parents
- Fussy eating continued, and parents would cook an entirely different meal for her at dinner from what the rest of the family was having
- By 16yo, she still had not had a period, and had not grown taller since she was 11yo.
- Heidi was becoming increasingly anxious and avoidant of social activities with friends due to food anxieties

**Myth 12: The child is just a picky eater, they’ll grow out of it**

Not growing out of picky eating can be a serious problem, and ~8% don’t

  - ‘30% of 3-11 year-old children have selective eating
  - ‘60% growth out of it’ within 2 years
- Those who don’t (‘1 in 200’):
  - Are less willing to try new foods
  - Have stronger food preference
  - Have more family conflict around food selections
  - Restricted food intake
  - Reduced bone density
  - Dysregulation

  - Early prevalence and epidemiological studies suggest 5-7% of ED patients may actually have AN
  - Concerns about eating behaviours at any age, with or without weight loss, should be taken seriously, with close monitoring to optimise early intervention

**Myth 13: They will eat when they are ready, let’s focus on the underlying factors**

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<thead>
<tr>
<th>Dietary pattern</th>
<th>Nutritional consequence</th>
<th>Maintaining impact on ED</th>
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<tbody>
<tr>
<td>ED with significant weight loss</td>
<td>Restricted food intake</td>
<td>PC refeeding Inadequate energy intake</td>
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<tr>
<td>ED with significant weight gain</td>
<td>Restricted macro/micronutrients</td>
<td>Inadequate Ca</td>
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<tr>
<td>ARFID with significant weight gain</td>
<td>Inadequate macro/micronutrients</td>
<td>Inadequate Ca</td>
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- Nutrition evaluation
- Consider the presence of micronutrient deficiencies and additional weight gain
- Consider the presence of micronutrient deficiencies, weight loss, and additional weight gain

  - Measurement of appetite/eating behaviour

**Weight management in children & adolescents**

- For children and adolescents who are overweight or obese, recommend lifestyle change — including reduced energy intake and voluntary exercise, increased physical activity and measures to support better lifestyle change
- Current Australian dietary and physical activity guidelines should be used as the basis of advice on dietary intake, physical activity and sedentary behaviour for children and adolescents
- Approach within a family approach have the strongest evidence
- For children & adolescents, the goal is not weight loss, but weight stabilisation
- For youth with obesity, with a BMI > 40 kg/m² or > 35 kg/m² with obesity-related complications, laparoscopic adjustable gastric banding/vertical bariatric operations should be considered if other interventions have been unsuccessful in producing weight loss


- Clinical Practice Guidelines for the management of obesity in adults, adolescents, & children in Australia (NH&MRC 2013)
Weight management in children & adolescents

Advice to support healthy eating in children

- Take a family approach to improving nutrition and be a good role model
- Ensure children have regular meals, including breakfast and snacks, in a sociable atmosphere
- Whenever possible, eat meals as a family
-Separate eating from other activities such as watching television or using the computer
- Encourage children to listen to internal hunger cues and to eat to appetite
- Have healthy foods readily available
- Avoid being restrictive or controlling of your child’s food intake
- Explain the concept of foods that are appropriate ‘often’ or ‘sometimes’
- Avoid using foods as treats or rewards
- Comfort children with attention, listening and affection instead of food
- Encourage children to develop healthy ways of regulating emotions (i.e. that don’t involve food)

(NH&MRC. Clinical Practice Guidelines for the management of obesity in adults, adolescents & children in Australia 2013)

Myth 15: The microbiome can inform dietary intake

Microbiome basics

- Only investigated in AN so far
- Intestinal microbiota:
  - Community of microorganisms, including bacteria, archaea, fungi, parasites, and viruses, that reside within the human GI tract
  - Trillions of microbes, equating to a 1:1 ratio of human-to-bacterial cells, with the greatest density and diversity found in the lower GI tract
  - Unique to each individual
  - Composition influenced by many factors
    - E.g. genetics, diet, health status, age, sex, geographical location, drug exposure

Microbiome research in AN

- Lower microbial diversity in AN pre (n=16) and post (n=10) refeeding compared with healthy controls (Kleiman, Watson et al. 2015)
- Profound microbial perturbations in AN patients (n=55) compared with normal weight controls (n=55) and elevated branched-chain fatty acid concentrations (Mack, Cuntz et al. 2016)
  - Distinct perturbations between AN-R and AN-BP
  - Microbial richness increased with weight gain (n=44), but disturbances in microbiota did not recover

Microbial influences in AN (Glenny et al. 2017)
**Myth 16: If the number on the scales goes up, body fat must have increased**

If the number on the scales goes up, wait and see!

Many factors may affect weight at any one time:

1. **Time of day**
   - Weight will always be lower in the morning and higher in the afternoon/evening, after more food and fluid have been consumed.
   - Always weigh patients at a similar time of day e.g. after breakfast, before afternoon tea, etc.

2. **Menstrual cycle**
   - Weight naturally fluctuates throughout the menstrual cycle in women.
   - It can be up anywhere from 0-7 kg (!) higher each month during the end of the luteal phase and during the first few days of menstrual flow due to fluid retention (usually 1-2 kg).

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**Myth 16: If the number on the scales goes up, weight must have gone up (cont.)**

3. **Hydration changes**
   - If a patient has drunk more or less, this will certainly impact on their weight.
   - If a patient has vomited in the last 24 hours, this may lead to either over or under-hydration, depending on their vomiting behaviours and body's response.
   - If the patient has been sweating more (whether due to weather or sport), they may be more dehydrated.

4. **Bowel movement changes**
   - If a patient is constipated, their weight may increase.
   - Likewise diarrhoea may cause weight to drop with fluid loss.

5. **Body composition changes**
   - If a patient has increased muscle mass, their weight may increase.

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**Myth 17: Patients need to be in the healthy range**

People can be healthy above a BMI of 25.

1. The BMI classifications developed by the WHO for ‘Normal’ (18.5-25) are based on prevalence data and statistics and it does not imply people must be within this range to be healthy.
   - 50% of individuals with a BMI 25-30 are metabolically healthy.
   - 40,420 participants from the NHANES study >18yo
     - 30% individuals in the obese range were metabolically healthy.
     - 30% of normal weight individuals were cardiometabolically unhealthy.

2. Athletes and other people with high muscle mass are often over a BMI of 25 and healthy.

3. We are healthier at higher weights.

4. There is considerable weight bias amongst some ED health professionals.

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**And finally… A word on those healthy foods**

- Spinach and leafy greens contain minimal iron.
- Pumpkin does not contain enough carbohydrate.
- Carrots certainly don’t have enough carbohydrate.
- A few strawberries is not a serve of fruit.
- Vegetable juice is not the same as fruit juice.
- Neither almond nor coconut milk have adequate protein or carbohydrate.
- Quinoa does not have as much protein as meat.
- Mushrooms are not a source of protein.