

Word	Form	Definition
analysis	noun	detailed examination of something
anthropometry	noun	the study of measurements of the human body
assessment	noun	evaluating or examining something
biochemistry	noun	the branch of science that explores living things
body mass index	noun	the measurement of a person's weight for their height
body fat percentage	noun	the percentage of the body that is made up of fatty tissue
circumference	noun	the distance around something
clinical	adjective	relates to medical work done and treatment of patients
consistent	adjective	when something continues to happen in the same way
deficient	adjective	not having enough of something that is important or necessary
diet	noun	the foods and drinks regularly consumed by a person
interpret	verb	to understand something in a particular way
measure	verb	to get the size or amount of something using a device which gives standardised units
monitor	verb	to watch or observe something over a period of time for a special purpose
nutrition	noun	the process of eating or drinking the right type of foods to maintain health
open-ended	adjective	allows people to answer in a way which is not limited or controlled
plot	noun	a point that shows the relationship between two things on a graph
technique	noun	a way of carrying out a task
underweight	noun	a person who has a BMI below 18.5

6.1 The importance of nutritional assessment

advise	يُنصح	Anthropometric	القياسات البشرية	Categories	فئات
community	مجتمع	Confused	مشوش	deficiency	نقص
Diarrhoea	اسهال	Dietitians	أخصائيو التغذية	essentials	أساسيات
Ideal	مثالي	interpret	يفسر	Interventions	تدخلات
Laboratory	عمل	low-income	دخل منخفض	Malnutrition / Malnourished	سوء التغذية
measure	يقيس	Poor	فقر	Pregnancy	حمل
programmes	برامج	Substances	مواد	undernutrition	نقص التغذية

Nutritional assessment

methods allow medical professionals to assess a person's nutritional status.

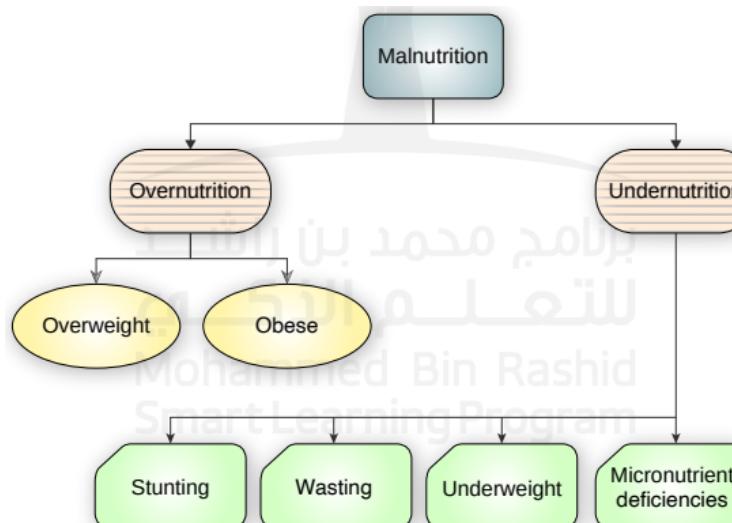
Medical professionals, such as dietitians, will often measure the nutritional status of a patient. They interpret the results to understand the patient's health status and advise them on how to improve their diet and overall nutritional status.

An ideal nutritional status happens when the intake of nutrients matches the nutritional requirements or needs of a person.

nutritional status : the state of a person's health depending on his or her diet.

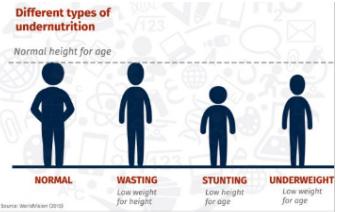
deficiency : a lack of, or shortage of something (such as nutrients).

Malnutrition	Undernutrition
Malnourished	undernourished
describe someone who has a poor nutritional status.	Describe a person who doesn't eat enough food or gets enough nutrients from the foods that they consume.
person may be underweight, overweight or obese. They could also be 'healthy' weight but have a deficiency of nutrients such as vitamins or minerals.	
Malnutrition and undernutrition are often confused.	
Malnourished people aren't always undernourished but they may be overweight or obese.	



Undernutrition

Long-term undernutrition especially for children can increase someone's risk of disease and even death.



Wasting الهزال

when someone is a low weight for their height.

severe weight loss, through lack of food or they have had an infectious disease, such as diarrhoea, which has caused them to lose weight.

A young child who is wasted has an increased risk of death.

Stunting تغزيم

when a child is a low height for their age.

It's the result of undernutrition over time
more common in low-income countries.

It's linked to poor nutrition of the mother during pregnancy and poor feeding during infancy.

underweight

when a child is a low weight for their age.

An underweight child may also be stunted or wasted, or both.

Deficiencies نقص

Micronutrients are vitamins & minerals needed for the body to produce enzymes, hormones, and other substances that are essential for proper growth and development.

Micronutrient deficiency is when someone isn't getting enough of certain vitamins or minerals.

Deficiencies in iodine, vitamin A, and iron are common and can be very dangerous, particularly for children and pregnant women in low-income countries.

Measuring nutritional status

The purpose of nutritional assessment الغرض من التقديم الغذائي

It can:

- ~ identify people who're malnourished or at risk of malnourishment.
- ~ identify issues or diseases that may be present.
- ~ develop healthcare programmes to meet the needs of a community.
- ~ Measure how effective nutritional programs & interventions were once they have been completed.

Nutritional assessment techniques

Many different techniques are used by medical professionals to assess nutritional status.

5 main categories of nutritional assessment known as ABCDE methods of assessing nutritional status.

Anthropometric methods 

Biochemical methods (laboratory) 

Clinical methods 

Dietary assessment 

Environmental factors 

Anthropometry : the physical measurement of the body.

6.2 Anthropometric

accurately	بدقة	Curves	منحنيات	Determine	حدد
gender	جنس	Heel	كعب	hip	ورك
Indication	علامة / إشارة	Rib	ضلع	skinfolds	طيات الجلد

Anthropo means 'human' and metry means 'measurement'.



Anthropometric measurements

include measuring height and weight.

It can include measuring the proportions of the hips, waist, legs, arms, and skinfolds.

Medical professionals analyse the results to determine a person's physical status.

Anthropometric measures are particularly useful in children; it can show if they are growing and developing at the correct rate and highlight any problems with their nutritional status.

These measurements will provide a quick indication of malnutrition (**obesity, stunting, wasting**).

منحنى الخصر Waist circumference

the total distance around the waist. A larger waist circumference shows there is more abdominal fat (fat around the middle of the body).

High levels of abdominal fat are linked with non-communicable diseases such as cardiovascular disease, cancer and diabetes.

Age, gender and ethnicity will affect the measurement

Waist circumference - Males	Waist circumference - Females	Classification
Less than 94cm	Less than 80cm	Desirable
94-102cm	80-88cm	High risk
More than 102cm	More than 88cm	Very high risk



How to measure waist circumference accurately.

- ~ Place tape at the mid-point between the top of the hip bone and the lower ribs. It can be measured over thin clothes.
- ~ The tape shouldn't be too tight or too loose.
- ~ Abdominal muscles should be relaxed.
- ~ The measurement should be taken after breathing out.

يوضع الشريط فوق عظمة الورك والضلع السفلي

الشريط يجب أن لا يُشد أو يُرخى كثيراً

عضلات البطن يجب أن تكون مرتخية

المقياس يجب أن يأخذ بعد الزفير

Measuring weight

- ~ Make sure the weighing scale is accurate.
- ~ remove heavy items from pockets such as mobile phones.
- ~ stand still with their arms by their sides.
- ~ Measure weight in kilograms (kg).

تأكد أن الميزان دقيق

أخرج الأشياء الثقيلة من الجيب مثل الهاتف النقال

قف بثبات ويديك على جانبيك

قياس الوزن بوحدة الكيلو جرام



Measuring height

- ~ Remove shoes
- ~ Stand straight with the back against the measure.
- ~ Make sure the measure is straight.
- ~ The heels, back and head should be touching the measure.
- ~ Look straight ahead.
- ~ Lower the reading bar to the top of the head so a measurement can be taken.
- ~ Measure the height in centimeters (cm).

ازل حذائك

قف مستقيماً والظهر على جهة المقياس

تأكد أن المقياس مستقيم

الكتعب، الظهر، الرأس يجب أن يكونوا ملامسين للمقياس

النظر مستقيم

ازلال شريط القراءة أعلى الرأس حتى يؤخذ القياس

قياس الطول يكون بوحدة السنتمتر

Growth charts

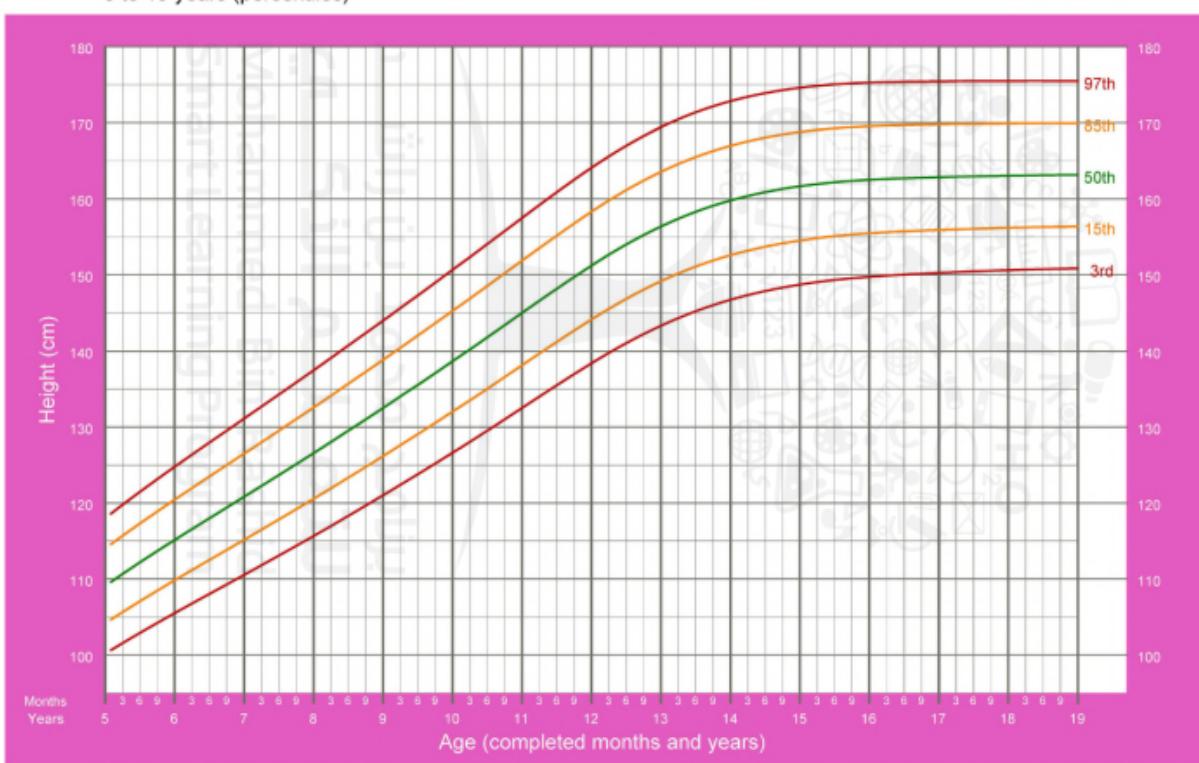
used to compare height and weight against people of the same age and gender & to follow a child's growth and it can identify some medical problems at an early age.

Lines or curves on the growth chart show the height of many other children at each age.

The WHO growth charts are divided up into age groups. charts for babies aged 0-2 years, 2-5 years, and 5-19 years. **In general, people don't grow after 19 years of age.**

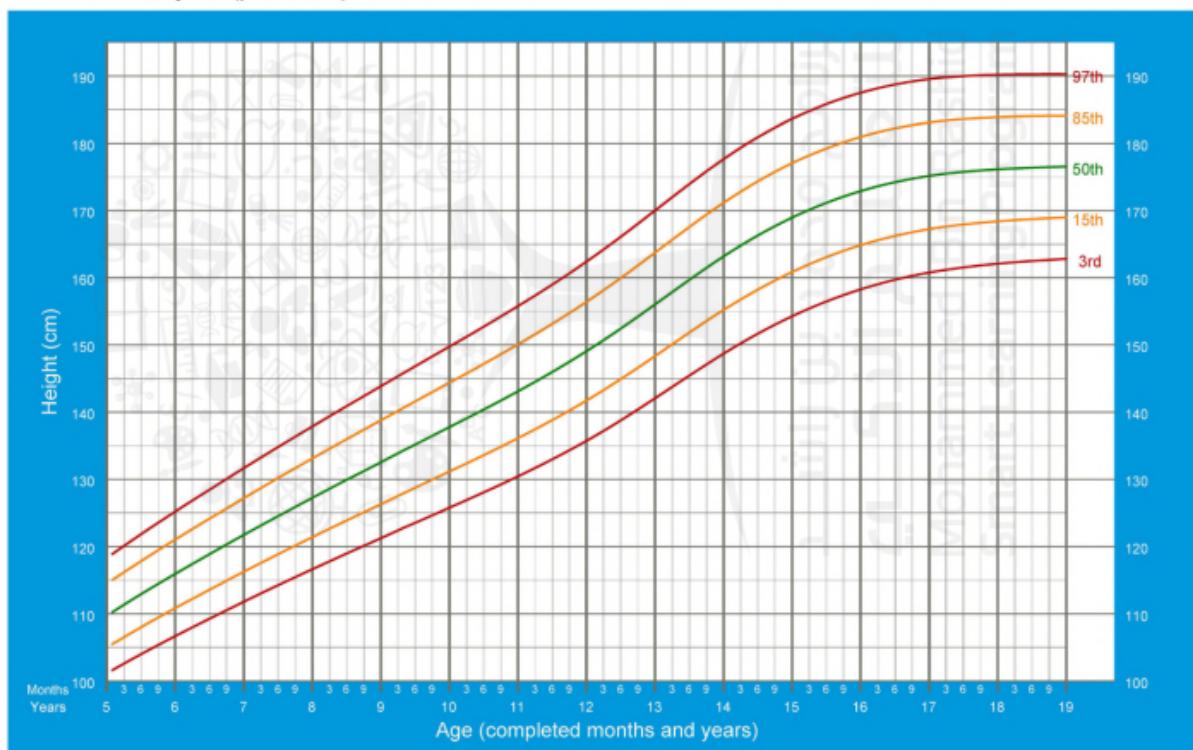
Height-for-age GIRLS

5 to 19 years (percentiles)



Height-for-age BOYS

5 to 19 years (percentiles)



To figure out where someone fits on the growth chart, you need to know :

~ gender (male or female) ~ age (usually in years) ~ height (in centimeters)

How the chart works

The bottom of the chart shows the age of the person.

Make a mark on the chart where the age meets the height of the person.

The red, yellow and green lines on growth charts are called **percentiles**.

Interpreting the results

Percentiles show how many other people (of the same age as the person being measured) are taller, shorter and the same height.

Example

* The height for 16-year-old males on the 50th percentile is 173cm. This means that the **average height** for 16-year-old males is 173cm tall. The **height** on the 97th percentile is 187.5cm. This means that only 3% of sixteen-year-old males are this height or taller.

* The height for 16-year-old females on the 50th percentile 162.5cm. This means that the **average height** for 16-year-old females is 162.5cm tall. The **height** on the 3rd percentile is 150cm. This means that 97% of sixteen-year-old females are this height or taller.

The WHO growth chart data are based on American population. When you plot the age and height of someone, you compare them to the average height of children in the USA.

Healthcare professionals use growth charts to compare the growth of individuals of the same age.

They help to monitor and track the development of boys and girls over time.

Growth charts can be used to identify a growth problem related to malnutrition.

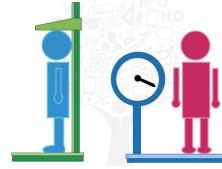
6.3 Body mass index (BMI) and body fat percentage

density	كتافة	mass	كتلة	thickness	سمك
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Body mass index (BMI)

A measurement of a person's weight for their height is used to identify weight status.

* To calculate BMI, you need to know the person's weight and height.



$$BMI = \frac{weight \ (kg)}{height^2 \ (m^2)}$$

Example

Sara weighs 58kg and her height is 1.61m.

$$\text{Sara } BMI = \frac{55}{1.61^2} = 22.4 \text{ kg / m}^2$$

After calculating BMI, understand the results.

BMI number will fall into one of 4 categories; **underweight**, **normal weight**, **overweight** or **obese** (there are different classes of obesity).

People with higher BMIs are overweight or obese.

People who have a high BMI are more likely to develop non-communicable diseases like diabetes and heart disease.

Underweight

A BMI result lower than 18.5.

The person should contact a healthcare professional about healthily gaining weight.

Healthy weight

A BMI between 18.5 and 24.9.

They should aim to maintain this weight by eating a healthy, balanced diet.

Overweight

A BMI result between 25 and 29.9.

They should consider talking to a healthcare professional about losing some weight in a healthy way.

Obese

There are different levels of obesity, but any **BMI above 30 is obese**.

person should seek professional help as they need to reduce their weight.

BMI is a measure of weight for height. It doesn't consider fat mass or muscle mass. A person could have a lot of muscle which would add to their weight and increase their BMI even though they have a healthy amount of fat.



Body fat percentage

Sometimes it's useful to use BMI with body fat percentage to assess health. A person could be **overweight** or **obese** according to their BMI, but their body fat percentage could be quite low. This happens a lot with sports players and athletes who have a lot of muscle.

Everyone has fat on their body. We need fat to protect our organs, provide energy, and help our bodies stay warm. Too much fat on the body can increase the risk of developing noncommunicable diseases such as heart disease and cancer.

Measuring body fat

You must first measure the amount of fat on the body.

The most accurate way to measure body fat is by using a **DEXA scanner**.



DEXA scanner : X-ray that shows an exact breakdown of fat mass, bone density and muscle mass.

Another methods:

skinfold thickness using calipers that grip the fat through the skin and can be used on different body parts.

Bioelectrical impedance analysis (BIA), **It sends a weak electrical current through the body. The person doesn't feel the electrical current.** The machine can tell when the electrical current is travelling through fat as opposed to muscle.



Skinfolds : areas of skin that can fold when pinched.

Calculating body fat percentage

You need three things for this:

~ Total body weight (TBW) in kilograms (kg) ~ Body fat in kilograms (kg) ~ Age

The formula for calculating body fat percentage = $\frac{\text{Body weight}}{\text{TBW}} \times 100$

Example

Maha's body fat is 14kg and her total body weight (TBW) is 58kg. She is 22 years old.

$$\text{Maha's body percentage} = \frac{14}{58} \times 100 = 24\%$$

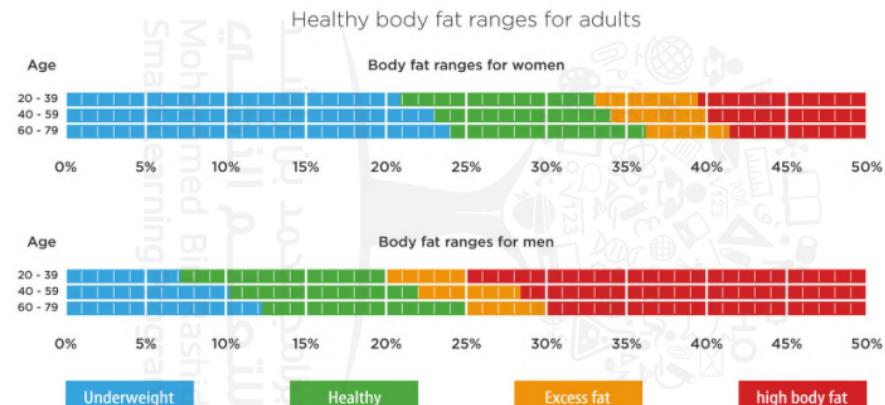
Understand the results

After calculate the body fat percentage, you need to interpret the results.

Body fat percentages change as people get older; this is why it is important to know the person's age, so you can accurately identify which category they are in.

There are 4 categories that a person can be in:

Blue	Green	Amber	Red
person has <u>too little</u> body fat for their age.	person has a <u>healthy</u> amount of body fat for their age.	person has <u>gone above the healthy</u> body fat for their age. They should try to reduce it.	person has <u>so much</u> body fat for their age. It could have a negative impact on their health by putting them at a higher risk of certain conditions. They need to reduce it.



6.4 Biochemical methods

digestive	هضم	samples	عينات	urine	بول
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Biochemical methods

Letter **B** in **ABCDE** stands for **biochemical methods**. (laboratory measurements of nutritional assessment).

biochemistry : a part of science that explores the chemistry of living things

Biochemical methods of assessment involve testing samples of blood and urine, to be tested in a lab facility.

When your body digests the food you eat, chemicals and nutrients are released into your bloodstream.
لما الجسم يهضم الأكل يتم اطلاق المواد الكيميائية والمواد المغذية في مجرى الدم

These travel around your body and are either stored, used up as energy or exit through your urine.
تنتقل العناصر حول الجسم و يتم تخزينها او استخدامها كطاقة او تخرج من خلال البول.

blood and urine are good ways to find out the nutrients that are present in someone's body.



The results

the laboratory specialist who interprets the results needs to know these about the patient who is being tested, includes:

~ previous medical history. ~ current medications. ~ clinical examination reports.

Biochemical methods of assessing nutritional status are the most accurate as they show exactly how much of a certain nutrient or enzyme is present in the body.

It is easy to see if someone is deficient in any nutrients by looking at their biochemical markers.

Sometimes deficiencies and nutrient-related diseases are identified before symptoms develop.

Biochemical methods don't require the patient to remember what foods they have eaten, or how much of a certain food they have eaten.

6.5 Clinical methods

fclues	أدلة	Financial resources	موارد مالية	Gums	لثة
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Clinical methods (physical examination)

Letter **C** in **ABCDE** stands for **clinical methods** of nutritional assessment.

Medical professionals look for physical clues of nutrition-related health problems in the body.

These clues may be seen or felt in different parts of the body.

Tissues of the body can show nutrient deficiencies include:					
Skin	Eyes	Gums	Hair	Nails	Mouth

If a person has a **sore mouth and bleeding gums**, it could suggest they are **deficient in some vitamins and minerals**.

If a person's **hair can be pulled out very easily**, it could mean they are **low in protein, iron or vitamin D**.

If a person's **nails are thin and indented**, it could suggest they have an **iron deficiency**.



Rickets : disease that causes the bones of children to become soft; bones don't grow or develop properly.
 العظام بتبقى لينة بسبب انه ما نمت او تطورت كوييس

The development of rickets is usually due to a **deficiency in vitamin D & calcium**.



What is checked in a physical exam?

Medical professionals need to know the patient's **medical history** when completing a physical exam.

~ Diarrhoea & other digestive issues أسهال ومشاكل هضمية أخرى ~ Medications أدوية

~ Previous or current medical conditions ~ Physical appearance

~ Signs of infection أعراض العدوى ~ Nutritional supplement use المكمّلات الغذائيّة المستخدمة

Other factors : the person's ability to prepare meals, financial resources, and social resources are considered.

Completing a physical examination and taking a medical history can help a doctor identify **malnutrition**. If there is, they may send the patient for biochemical testing to check which nutrients are causing problems.

6.6 Dietary methods

consumption	استهلاك	Fear	خوف	Frequency	تكرار
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Dietary intakes

Letter **D** in **ABCDE** stands for **dietary intake**.

Patient must record the food and drinks that they consumed in a given period.

Nutritional assessment is completed by healthcare professionals who consider the foods eaten, and patterns of consumption.

This method of dietary assessment relies on honesty of the patient to accurately record the correct foods, the correct cooking methods, and the amounts eaten.

Recording dietary intakes

3 most common ways to measure dietary intake :

~ **24h dietary recall** ~ **3 day food diary** ~ **Food frequency questionnaire**

open-ended
method
of nutritional
assessment.

24h dietary recall (done over 24 hours)

Patients must remember what they ate within 24 hours (usually from midnight on one day until midnight the next day).

A medical professional will interview the patient and ask questions such as “Did you eat anything after breakfast?” The patient should give as much information as they can about the foods and drinks, they consumed.

The patient needs to recall:

~ ingredients & cooking method used. المكونات وطرق الطهي ~ time of day they had it. الوقت اللي أكله فيه

~ amount of food eaten. كمية الاكل اللي أكله ~ if they had any leftovers. إذا زاد بقايا من طعامه

Advantages

- ~ Information is easy to collect.
- ~ Most patients can remember what they ate on the previous day.
- ~ Recalls don't take large amount of time to complete & can be done over the phone or in person.
- ~ The information provided can estimate regular food and nutrient intake.

Disadvantages

- ~ This method depends on memory only. Some people may have difficulties recalling the portion size of their food, or how much they had left over.
- ~ If a patient ate in a restaurant, they may not know the cooking methods or ingredients used.
- ~ It only gives an overview of one day's eating pattern. This may not show the patient's regular eating habits.
- ~ Some patients will not give honest responses because of fear of being judged by the medical professional that is interviewing them.

3-day food diary

The 3-day food diary is like the 24h dietary recall as it is an **open-ended method of nutritional assessment**.

patients must record food intake for 3-days:

يُطلب من المرضى ملء 3 أيام من أيام الأسبوع، وذلك يومين من أيام الأسبوع و يوماً من أيام الاسبوع.

They should record the same information as on a 24h diet recall.

Information should be recorded in real time and not from memory.

Weights of foods should be measured using scales. Because of this, it is expected to be more accurate than a 24-hour recall, where portion sizes are not expected to be as accurate.

Advantages :

- ~ The level of detail provided (3 days of food intake, mealtimes, and weights of portions) will allow for accurate estimates of regular dietary intake.
- ~ Diary entries are done in real-time; doesn't depend on memory.

Disadvantages:

- ~ It requires a high level of commitment to weigh and record every item of food eaten.
- ~ When people know they must record all the food they eat, they may change their eating habits. However, they might forget to record certain smaller items, like salt or butter, that they add to their meals.

Food Frequency Questionnaire (FFQ)

has a set number of questions with multiple-choice answers about portion size and how often food is eaten. It's **not an open-ended method of nutritional assessment**.

FFQs may ask how often a portion of food is eaten over a week, a month, several months, or a year.

FFQs have an interviewer trained in how to ask questions to the patient. They are useful when medical professionals want to analyse the intake of a small number of foods or one single food group.

Advantages:

- ~ can be used on large groups of people.
- ~ quick and easy to complete.

Disadvantages:

- ~ Specific foods are listed. Sometimes food could be forgotten or missed out.
- ~ Some people's eating patterns of certain food items are not consistent.
- ~ requires a good level of memory.

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
BREAD AND SAVOURY BISCUITS (one slice or biscuit)									
White bread and rolls						✓			
Brown bread and rolls				✓					
Wholemeal bread and rolls	✓								
Cream crackers, cheese biscuits		✓							
Crispbread, eg. Ryvita		✓							
CEREALS (one bowl)									
Porridge, Readybrek				✓					
Breakfast cereal such as cornflakes, muesli etc.					✓				

6.7 Environmental factors

affordable	معقول/يسير	Convenience	راحة	Grocery	بقالة
nearest	الأقرب	Religious	ديني	restrictions	قيود

Different **environmental factors** can impact a person's nutritional status, such as access to healthy food, the ability to cook it, and cultural factors that may affect food choices.

Socioeconomic : relating to people's background or social status and income

الوضع الاجتماعي والاقتصادي Socioeconomic status

If someone has a limited income, they may not be able to spend much money on food.

Healthier foods are generally **more expensive** than **unhealthy foods**.

Where someone lives can impact their ability to cook healthy meals,

مثلاً لو كان بيتهما مابيحتوي على مكان طبخ مناسب أو ماعندهم إمكانية يحصلو على أكل صحي بأسعار معقولة قريب من بيتهما.

Although unhealthy eating may be cheaper in the short term, the consequences of a lack of healthy food in the long-term can have severe effects on health and result in non-communicable diseases. مع أنه الأكل غير الصحي قد يكون أرخص إلا أن عواقب نقص الغذاء الصحي على المدى الطويل لها آثار تؤدي إلى أمراض غير معدية

Nutrients available

When assessing nutritional status, it's important to consider the food options available for people.

In certain countries, **food availability will depend on weather and seasons**. There could be other reasons, **good food is not able to get to certain areas, such as war or natural disasters**.

Food deserts الصاري الغذائي

People **don't** have **easy access to** affordable, healthy food options; usually because there is no grocery store within convenient traveling distance.

more common in low-income areas, where the nearest supermarket may be a long way away and not easy to access via public transport.

Studies have found that wealthy areas have x3 times as many grocery stores as poor ones.

Limited food options and affordability impact people's food choices.

Food deserts lack healthy options but have many fast-food chains and convenience stores selling unhealthy processed foods. فيه نقص بخيارات الاكل الصحي، والاكل الغير الصحي والمُعد تكريره كثيرة محلاته.

Other dietary restrictions should also be considered, such as allergies and intolerances like lactose intolerance and gluten allergies as this will limit food choice, especially of those who don't have access to larger hypermarkets that have more selection.

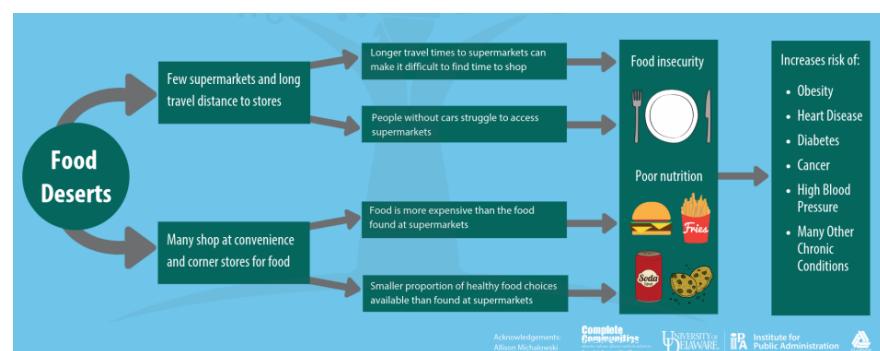
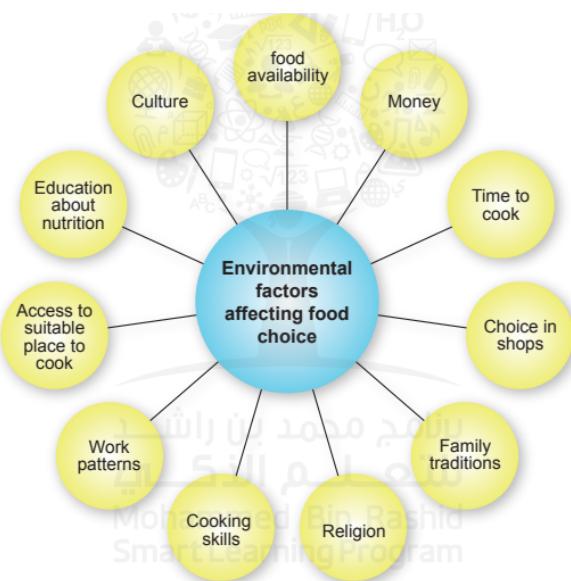
Cultural factors

Traditional foods from certain cultures may not be very healthy, so it is important to consider the types of foods that people may be eating when assessing nutritional status.

Religious practises may have certain food rules or restrict certain foods, this should be considered, especially if someone lives in an area where it's not easy to access certain foods.

Example

If you are Muslim and move to a non-Islamic country, you may find it hard to find healthy Halal food options. This will result in you having to change your diet based on the Halal options available, which may be very limited.



Acknowledgments:
Allison McNauley

Complete
Competency
completecompetency.org

UNIVERSITY OF DELAWARE

Institute for
Public Administration

