

Activity 19: Issues for further research in skin protection: Sun exposure and vitamin D and fake tans

Aims

- To increase knowledge of sun exposure, vitamin D and fake tanners.
- To research contemporary issues relating to sun protection and tanning.
- To identify health issues and develop strategies to deal with those issues for self and others.

Assessment outcomes English 4.3; H&PE 4.6; S&E 4.11

Reference fact sheets Fact sheet 5: Sun exposure and vitamin D
Fact sheet 12: Fake tanners

Teacher guidelines

Research the questions which follow regarding:

- sun exposure and vitamin D, or
- fake tanners.

Sun exposure and vitamin D

Over-exposure to the sun's UV radiation is the major cause of skin cancer. However UV radiation exposure is also important to the body for production of vitamin D which is needed for healthy bone growth and development. The question is, how much sun do we need for vitamin D production? Recently concern has been raised about the numbers of vitamin D deficient people in some groups in the community. These groups include those who are housebound, cultural groups who cover their skin or heads with clothing and veils for religious reasons, those with dark skin and children born to mothers with vitamin D deficiency.

- a) Why is sunlight needed to manufacture vitamin D?
- b) What is the function of vitamin D?
- c) What happens to the body if there is a deficiency of vitamin D?
- d) How much sunlight is required to obtain adequate amounts of vitamin D in different regions of Australia?
- e) Which population groups are at particular risk of not receiving sufficient vitamin D?
- f) Outline ways you can receive adequate vitamin D but still be SunSmart.

Fake tanners

Some people use fake and/or spray-on tans as an alternative to tanning in the sun. The concern with this practice is that product users often think that the tan will protect them from the sun. Fake tanning lotions and/or spray-on tans offer no protection against UV radiation.

- a) Find out about fake tanning products and how they work.
- b) Why do people use fake tanning products?
- c) Do fake tanning products offer any protection from UV radiation?

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- d) Explain why people using fake tanning products need to protect themselves from UV radiation.
- e) How should people using fake tanning products protect their skin?
- f) Is there any evidence that fake tanners damage the skin?
- g) Think of a strategy that could be used to help people become more aware of the risks involved with using fake tanners.
- h) Write a response to the following question: Should there be a label on fake tanning products warning of the dangers of inadequate sun protection? Explain why.



Fact sheet 5: Sun exposure and vitamin D

Australia has the highest rates of skin cancer in the world with one in two Australians developing skin cancer sometime during their life. Over-exposure to the sun's ultraviolet (UV) radiation is the major cause of skin cancer. UV radiation exposure is also important to the body for the production of vitamin D which is needed for healthy bone growth and development. So how much sun do we need for vitamin D production?

UVR exposure and skin cancer

The link between exposure to the sun's UV radiation and skin cancer is well known. Ultraviolet radiation is the part of sunlight that causes sunburn and skin damage. This can lead to premature ageing and skin cancer.

Australia has high levels of UV radiation because the country is close to the equator. UV radiation levels vary throughout the year. This can depend on:

- The height of the sun (the higher the sun in the sky the higher the UV radiation levels)
- Whether you're in the north or the south of Australia
- The amount of cloud cover
- The altitude
- Ozone levels
- UV reflective surfaces (light coloured concrete, water, snow).



The higher the UV radiation levels, the less time it takes for skin damage to occur. Generally UV radiation levels are most intense around the middle of the day (10 am to 3 pm).

UV radiation intensity is reported on an index called the UV Index (UVI). It divides UV radiation levels into:

- low (1–2)
- moderate (3–5)
- high (6–7)
- very high (8–10)
- extreme (11 and above).

UV radiation is strong enough at a UV Index of 3 to cause skin damage, therefore skin protection is recommended when the UV radiation level is 3 and above.

In Australia, the Bureau of Meteorology forecasts the highest UV level for the following day on their website www.bom.gov.au. When the UVI forecast is 3 or above, you need to protect yourself because the UV radiation is intense enough to damage the skin.

Vitamin D and sun exposure

Vitamin D is needed for the development of strong healthy bones. Recent studies have found that some groups of people who have limited exposure to the sun don't produce enough vitamin D.

While the sun helps your body produce vitamin D, you only need a little exposure to get the benefit. Most people receive enough vitamin D simply by going about their day-to-day lives and don't need to make a special effort to go outside to increase their "dose" of UV radiation for vitamin D production.

How much sun exposure is needed in South Australia for adequate vitamin D?

September to April

- UV radiation levels are, on average, 3 and above from September to April in South Australia. Skin protection is recommended during these months.
- From September to April expose your face, arms and hands to the sun for 10 minutes either before 10 am or after 3 pm on most days of the week.

May to August

- UV radiation levels are lower.
- Expose your face, arms and hands to the sun for two to three hours per week.

Those travelling or living in the north of Australia should protect themselves all year round.

Will sunscreen stop you getting enough vitamin D?

Sunscreen filters out most but not all UV radiation. Regular use of sunscreen when the UV radiation level is 3 (moderate) or more does not greatly decrease vitamin D levels over time.

Fact sheet 5: Sun exposure and vitamin D (cont.)

Most people are not at risk of low vitamin D

Only some people living in Australia have low levels of vitamin D.

They include:

- The elderly, especially those who do not go outdoors very often — older people also don't produce vitamin D as well as young people.
- People with dark skin, who naturally have more melanin, the pigment that reduces the amount of UV radiation getting through the skin.
- People who cover their skin and heads with clothing and veils for cultural or religious reasons, so less skin is exposed to UV radiation.
- Babies of mothers who have low levels of vitamin D.

These people generally have little exposure to the sun, especially during winter if they live in the southern half of Australia. This is usually why they may not get enough vitamin D.

People concerned with their vitamin D status should discuss this with their doctor.

How to protect yourself when the UV radiation levels reach 3 (moderate) and above

- Minimise your time in the sun between 10 am and 3 pm when UV radiation is strongest.
- Use shade wherever possible.
- Wear clothing that covers as much skin as possible.

- Wear a hat that protects the face, ears and neck.
- Wear close fitting sunglasses that meet the Australian Standard 1067.
- Use broad spectrum, water resistant SPF 30+ sunscreen, and reapply it every two hours.

When in alpine regions or near highly reflective surfaces like snow or water, use sun protection at all times of the year, anywhere in Australia.

References

P Gies et al. "Global Solar UV Index: Australian measurements, forecasts and comparison with the UK." *Photochem Photobiol* 2004; 79(1):32–9

R Marks, PA Foley, D Jolley, KR Knight, J Harrison, SC Thompson. "The effect of regular sunscreen use on vitamin D levels in an Australian population. Results of a randomised controlled trial." *Arch Dermatol* 1995 Apr;131(4):415–21.

J Farrerons, M Barnadas, J Rodriguez, A Renau, B Yoldi, A Lopez-Navidad, J Moragas. "Clinically prescribed sunscreen (sun protection factor 15) does not decrease serum vitamin D concentration sufficiently either to induce changes in parathyroid function or in metabolic markers." *Br J Dermatol* 1998 Sep;139(3):422–7

J Farrerons, M Barnadas, A Lopez-Navidad, A Renau, J Rodriguez, B Yoldi, A Alomar. "Sunscreen and risk of osteoporosis in the elderly: a two-year follow-up." *Dermatology* 2001; 202(1):27–30.

Australian and New Zealand Bone and Mineral Society, Osteoporosis Australia, Australasian College of Dermatologists and the Cancer Council Australia: Risks and benefits of sun exposure. Position Statement 2005.



Fact sheet 12: Fake tanners

There is a wide range of fake tanning products promoted commercially.

Lotions - skin dyes

Fake tanning lotions, sprays and creams contain dihydroxyacetone (DHA), a chemical or vegetable dye that temporarily stains the skin, giving a tanned appearance. The dye binds to the skin and comes off when the dead skin cells flake off. Although some brands include a sunscreen they do not provide adequate protection from UV radiation.

Tablets

There are also tablets commercially available. The tablets contain beta-carotene, a Vitamin A related chemical responsible for the orange colour of a number of fruit and vegetables. These tablets produce an orange skin colour that may remain for several weeks on the palms and soles after use of the tablets has stopped. The tablets offer no protection from UV radiation.

Protection from UV radiation

Lotions and skin dyes offer no protection against UV radiation. Although some brands do include a sunscreen, the protection from the sunscreen does not last for the length of time the tan remains on the skin. The sunscreen will only provide a few hours of protection from the time

of application. To prevent sun damage a SPF 30+ broad spectrum sunscreen should be applied prior to sun exposure.

The Cancer Council strongly recommends that people using a fake tanning product protect themselves when outdoors with SPF30+ broad spectrum sunscreen, a shady hat, sunglasses and protective clothing if they are going to be exposed to UV radiation.

Recommendations

- 1 People who have a strong desire to change their skin colour should choose a fake tanning product in preference to UV radiation (direct sunlight or solarium).
- 2 Fake tanning product users should continue to protect their skin by:
 - Taking particular care to cover up between 10 am and 3 pm,
 - Wearing a broad brimmed hat, sun protective clothing, sunglasses and seeking shade,
 - Using a broad spectrum SPF 30+, water resistant sunscreen.

