

Pupils were expected to spend their midday break outside, regardless of the weather, in a playground where minimal shade existed.

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Sun safety education in schools

Cancer education in schools has traditionally been a neglected area, possibly because adults in general have a fear of the disease. Teachers as a group are no exception, and this can result in children acquiring knowledge from a variety of sources outside the classroom, one of which may be overhearing adults discussing people with cancer. By misinterpreting what they hear, or by hearing old wives' tales, children can adopt pessimistic and fearful attitudes to cancer (Raine 1989).

These ideas need to be replaced by realistic health beliefs and attitudes. The United Nations Universal Declaration of Children's Rights (1989) addresses this notion and has formalised children's right to knowledge about health. In recognition of this, health educators are keen to inform children about disease prevention, health-enhancing behaviours, and of course about the appropriate steps that society as a whole might take to facilitate this.

Skin cancer

Skin cancer is slowly emerging as an area in which well-presented educational packages seem to have a valuable place in disease prevention. Most of the mortality associated with skin cancer is attributable to malignant melanoma, which, although still comparatively rare, is on the increase in many parts of the world. It is however preventable, and treatable if diagnosed early enough. The Government's *Health of the Nation* document (1992), which outlines its strategy for health, identifies skin cancer as one of the target areas, calling for a halt to its present

year-on-year increase (DOH, 1993).

There appears to be little doubt that ultraviolet light plays a major role in the aetiology of malignant melanoma. In fact, epidemiological data have indicated that sunlight is important in the development of all skin cancers in constitutionally predisposed, i.e. fair-skinned, people (Elwood et al., 1985).

What is interesting is that epidemiological data now indicate that exposure to sunlight in childhood, in particular traumatic sunburn with pain lasting at least 2 days, is important in the development of malignant melanoma, usually in early adult life (Armstrong, 1994).

Primary prevention

Prevention of malignant melanoma relies on encouraging children to adopt new prevention behaviours against sunburn, like the appropriate use of protective clothing including sunhats, seeking shade when the sun is at its hottest (between 11am and 3pm), and the judicious use of suncreams.

Many dermatologists would wish to discourage sunbathing *per se*, but others such as Doherty & Mackie (1988) suggest that it would be impossible to eradicate the habit of sunbathing (20- to 30-year-old campaigns to discourage cigarette smoking have been disappointing), and advocates *sensible* sun exposure. Others, such as Mermelstein & Riesenber (1992) suggest that comparisons with no-smoking campaigns are unfair, since sun protection campaigns will have the advantage of having the cosmetic and sunscreen industries on its side,

Sunbathing is an established habit — sensible sun exposure must be the aim.

whereas the anti-smoking campaign has fought a hard battle against the tobacco industry.

Educational packages

There are, then, strong reasons for offering children of all ages educational packages focusing on skin cancer prevention. Girgis et al. (1993) note that childhood is a stage in life when habits, attitudes, and lifestyles are being established and are still malleable. To date there are only a handful of studies that have explored skin cancer education in children, and the majority of these have been undertaken outside the UK: Ramstack (1986), Loescher et al. (1995), Ramsdell (1991), Mermelstein & Reisenberg (1992), and Rassaby et al. (1983).

It is difficult to make comparisons between these and other studies as they pertain to different age ranges (nursery children through to teenagers) and a variety of different education systems; and a range of professionals — not just teachers — was used to undertake the education. The author (Syson-Nibbs, 1996) reviewed the literature and noted that all the studies reported positive sun-safety knowledge scores and many reported positive attitude scores.

In this country the work of Julia Newton and others, reported in *Education and Health* (Newton et al., 1993), represented the first attempt in this country to measure the effectiveness of an education package about sun safety and skin cancer in secondary schools. Seven schools were recruited across the country, and individual class teachers used workbooks and video material to teach children with a mean age of 14 years. The results were measured using self-completed questionnaires that addressed the pupils' knowledge, attitudes, and behaviour. They demonstrated a significant improvement in *knowledge and attitude* compared with the control group, but no significant difference in *behaviour*.

This work was exciting because it broke new ground in this country, but it relied on individual teaching style, skills, and levels of motivation, which will inevitably have varied between schools.

Behaviour is harder to affect than knowledge or attitudes.

Table 1. The mean knowledge scores (out of 29) for the control and experimental groups, measured just before and 4 months after the sun-safety intervention.

	Control Mean	Control SD	Experimental Mean	Experimental SD	t-test	Sig
Pre	18.9	2.9	18.5	3.2	-0.86	NS
Post	20.0	3.4	24.0	3.2		
t-test	-2.12		-10.46			
Sig	NS		p<0.0005			

This work by Newton and others provided me with the impetus to evaluate my own health-promotion work in the field, by allowing me to integrate research methods and findings into day-to-day health visiting with the aim of improving practice.

Evaluation of an education programme

In 1996 I undertook a randomised control study in a local secondary school in rural Derbyshire (Syson-Nibbs, 1996). Six Year 7 classes containing altogether 145 pupils were divided at random into two groups of three. The experimental group (70 pupils) received immediate sun-safety education, while the control group (75 pupils) had it delayed until after the study was completed.

Evaluation was conducted using self-completion questionnaires. Baseline data were obtained before any work was done with the pupils, while post-intervention data, using the identical questionnaire, were collected 4 months later, allowing a comparison between the control and experimental groups.

The educational material used was the same as that employed by Newton, and consisted of:

- A coloured leaflet about sun safety, published by the Imperial Cancer Research Fund.
- A workbook containing basic information about ultraviolet radiation and skin cancer.
- A video called *Suncool* which addressed attitudes to sunbathing and skin cancer.

I led the education sessions, supported by each class's individual year teacher.

Results: Knowledge scores

Table 1 shows the mean knowledge scores by group pre- and post-intervention. Analysis by t-test of the differences within groups for the experimental subjects shows:

- No significant initial knowledge difference between the control and experimental groups.
- Within the control group, no significant change of knowledge over the 4-month interval.
- Within the experimental group, a significantly higher post-intervention knowledge score (up from 18.5 to 24.0, $t=-10.46$, $p<0.0005$).

Fig. 1. The 15 'attitude' items used in the pre- and post-intervention questionnaires.

Agree/don't know/disagree
1. I feel more healthy with a suntan.
2. I take great care to avoid getting sunburnt.
3. A suntanned person looks more healthy.
4. I try to avoid going out in the sun when it is hottest.
5. It is worth a lot of effort to get a suntan.
6. A lot of sun throughout life ages the skin.
7. Once you get a suntan it is easier to enjoy the summer months.
8. Most of my close family think a suntan is a good thing.
9. I find it difficult to protect myself from the sun.
10. Most of my friends think a suntan is a good thing.
11. Skin cancer is a dangerous disease.
12. There is little chance that I will get skin cancer.
13. Often in summer months I don't bother putting on a hat.
14. A suntan protects you against skin cancer.
15. In summer sunshine I usually take care to put on some sunscreen.

As in Newton's work, baseline knowledge scores were found to be generally high, with pupils scoring on average approximately 18 correct answers out of 29. It appeared that children scored more highly on environmental questions than health or cancer-related questions.

The experimental group's post-intervention scores demonstrate that learning did take place. In one tutor group the knowledge score increased from 16 to 24.

The tutor groups each represented children of mixed abilities, so one explanation might be the standard of educational intervention given. Great care was taken to ensure that all groups received the same input; nevertheless, varying classroom environments (too hot or too cramped) and timetabling of lessons (for example, those arriving from physical education took much longer to settle down) would have altered the children's receptiveness. Finally, since I was managing the research project and teaching in addition to my routine workload, there may well have been occasions when my classroom style lost some of its dynamism!

In health promotion terms the real value of increasing knowledge about a given subject lies

in its ability to help individuals move from a precontemplative to a contemplative stage of change in behaviour (Prochaska, 1992). In children the influence of parents, peers, and teachers is especially strong; and any action taken by these groups to enhance health knowledge will contribute to older children and adolescents moving to the contemplative stage.

Attitudes that changed

Attitudes as well as knowledge were measured, and Fig. 1 shows the 15 items, to which the responses were *agree*, *don't know*, and *disagree*. Within the control group there was no significant change in any of the items, but in the experimental group three of them changed significantly in a desirable direction.

I try to avoid going out in the sun when it is hottest.

Almost 20% more children agreed (50.0% from 30.7%, $\chi^2 = 5.8$, $p<0.05$).

Many pupils pointed out that this was difficult during school term, as they were expected to spend their midday break outside regardless of the weather in a playground where minimal shade existed. In group work, pupils offered many imaginative ways of creating more shady areas outside, as well as discussing the benefits of adopting continental school hours.

A lot of sun throughout life ages the skin.

Almost 40% more children agreed (70.4% from 31.9%, $\chi^2 = 21.3$, $p<0.0005$).

All the classroom work focussed on the appeal of retaining one's *natural* skin colour as a way of avoiding prematurely thickened or wrinkled skin. Information emphasising the desirability of white or pale skin was avoided in view of its hidden racist message. This attitude change was especially pleasing, for it supported other research in which appearance-based messages were more successful than health messages in changing attitudes and reported behaviour intention amongst adolescents (Howard, 1992). The range of maturation rates, cognitive abilities, and social backgrounds amongst 11-12 year old subjects will vary, but a significant number of them will be starting to take an interest in their attractiveness to others.

In group work, pupils offered many imaginative ways of creating more shady areas outside.

There is little chance that I will get skin cancer.

Almost 20% more disagreed with this statement (38.6% from 20.3%, $\chi^2 = 5.9$, $p < 0.05$).

Had the intervention alarmed them or had they become more aware of the prevalence of cancer as a potential illness amenable to prevention and cure? The classroom intervention tried to avoid a narrowly-focussed medical model of illness, as this can run the risk of placing the burden of responsibility far too heavily on the individual and can contribute to fear. So although pupils were encouraged to take note of their bodies (especially in the development of moles) and to understand from whom they could seek advice on health issues, wider issues like the implications of VAT on the cost of sunscreens were also addressed.

It is well-established now that perceived susceptibility to an illness plays a major role in the likelihood of change to health-enhancing behaviours (Janz & Becker, 1984). In relation to skin cancer prevention these include perceived susceptibility and severity of skin cancer, and the perceived benefits and barriers associated with the adoption of sun-safety behaviour. Evidently the attitude results suggest that some of these issues have been successfully addressed.

The changes in attitudes were limited to a few items, but, as found by other studies, reported changes in attitude occurred only when knowledge scores had also improved. Jones (1994) discussed this phenomenon in relation to work with adolescents and their sunbathing habits. He suggests that because health-risk messages often carry 'demand' characteristics, subjects can be led to report healthy attitudes and intentions as a result of experimental demand. This must be borne in mind when interpreting any research that does not measure behavioural changes as well.

Attitudes that did not change

It may be useful to examine some of the attitude items that did not change and to consider why this was so.

I take great care to avoid getting sunburnt

Childhood sunburn is such a strong risk factor for development of malignant melanoma in adult life that this might have been a more disappoint-

ing result, but for the fact that in all groups, pre- and post-test, fewer than 20% disagreed with this statement. It would appear, therefore, that the majority of these pupils had good intentions with regard to sun safety. Of course the research offers no insight into the precautions actually taken, and it is possible that as a result of the intervention some pupils changed from ineffective sun-safety methods, such a low factor sunscreen, to effective ones such as avoiding the midday sun.

Often in the summer months I don't bother putting on a hat

The results showed that only 24-30% often put on a hat, and these are similar findings to those of Newton et al. (1993). However studies in America and Australia all found an increase in intention to wear a hat after intervention. The most likely reason lies in cultural norms. In Australia pupils are forbidden to play outside at break times if they are not wearing a suitable hat. There are strong arguments for adopting a similar approach in UK schools.

Wearing a sunscreen, avoiding sunburn, risk of skin cancer

Finally there was a very small sub-group in this sample that did not take these precautions and still did not consider themselves at risk from skin cancer. Cockburn (1989) addressed this group in research that sought to determine the prevalence of the use of sun-protection measures in adolescents.

In her massive survey of 3,000 adolescents she identified an association between cigarette smoking and a failure to use sunscreens, and the study suggested that failure to use such sun-protection methods is part of a constellation of risk-taking behaviours. Such risk-takers are therefore the group on whom most resources should be targeted. It is, perhaps, worth noting at this point that in schools with high numbers of pupils smoking there are also higher numbers of teacher smokers — do such schools also have higher numbers of teachers sunbathing at break times?

Conclusion

The small study described here appears to follow a similar trend to others inasmuch as sun-safety educational intervention (by a health visitor) was successful in improving knowledge and attitudes in 11-12 year olds.

Reported changes in attitude occurred only when knowledge scores had also improved.

For one group of young people, failure to use sun-protection methods is part of a constellation of risk-taking behaviours.

The school involved is about to become part of the 'healthy schools' initiative, and has continued to address the issue of sun safety. The topic has shifted from a summer months issue to one that is being considered throughout the year. For example, this year pupils of various ages have been designing and producing their own sun-safety video and leaflets during the winter and spring terms, with help from a variety of teaching and technical staff as well as the health visitor and school nurse. The material is about to be tested on Year 7 pupils.

Sun-safety education can occur through the formal curriculum, through pastoral care, or both. For example, art and technology students could design a park or play area with plenty of shade. In history, students could chart attitudes to tanning or the development of foreign travel and its health implications. In personal and social education feelings of self-worth, relationships, sex roles, and the influence of advertising can be examined as part of developing healthy attitudes towards skin cancer prevention.

Education also takes place in the hidden curriculum. This might include the examples set by teachers. Physical education teachers, like many outdoor workers, are often sun-tanned and therefore more vulnerable to the non-melanoma skin cancers, a fact of which many of them will be unaware. They provide strong role models for many pupils, and their physical fitness is often inextricably linked to their suntans. They have a responsibility to educate their pupils about the need to adopt sun-safety behaviours, and could perhaps start sporting colourful zinc cream, like so many Australian cricketers!

The success of sun-safety messages in other countries, notably Australia, has resulted from highly co-ordinated public health campaigns ('Slip Slap Slop') in which school-based education packages form a small but vital part. Joint initiatives between health and education are effective, and should be encouraged as far as possible.

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