

Preventing Skin Cancer: Education and Policy Approaches in Primary School Settings

Summary Evidence Table

Author, Year Location; Study Design; Design Suitability; Study Quality	Follow-up interval n Limitations Race/Ethnicity SES	Demographics: Age Sex	Intervention (behavioral and health outcomes only), p-value, within or between groups	Results: Summary Effect Measures
<p>Bastuji-Garin et al., 1999 France Before-and-after study Least suitable Good quality</p>	<p>F/U: 3 months from end of I n = 203 Limitations: Neither the content nor the intensity of the education were described in detail; no description of the sampling frame for the schools or eligibility criteria; volunteer sample of schools may have selected for staff with an interest in the subject and biased results away from the null; single interviewer not blinded; intervention may have changed self-reports rather than actual behavior; unrelated time trends may have contributed to apparent positive effects</p>	<p>Mean age: 9.2y % Female: 50.5% Race/Ethnicity: NR SES: Upper middle class</p>	<p>Interactive sun-awareness program consisting of individual journals prepared by the children, and a skit and poster, or interactive game to integrate material of each sun awareness topic; weekly packet provided a different topic each week for 4 weeks</p>	<p>Child health outcomes and sun-protective behaviors (single items) Children reporting that their skin never sunburns: Absolute change: +20.0 Relative change: +42.7% ($p < 0.001$, within) Children reporting that they always wear a hat Absolute change: +9.9 Relative change: +41.6% ($p = 0.01$, within) Children reporting that they always wear a t-shirt: Absolute change: +2.5 Relative change: +5.3% ($p = 0.01$, within) Children reporting that they avoid sunny hours Absolute change: +10.8 Relative change: +16.4% ($p = 0.02$, within) Children reporting that they always wear sunscreen: Absolute change: +9.4 Relative change: +37% ($p = 0.03$, within)</p>

<p>Buller et al., 1994 Arizona RCT Greatest suitability Good quality</p>	<p>F/U: Immediately following end of I n = 139 Limitations: Limited demographic information on study population; no description of schools; convenience sample of schools; self-reported outcome measures; group design but individual analyses may have resulted in overestimated effect</p>	<p>Mean age: NR (4th–6th graders) % Female: NR Race/Ethnicity: NR SES: NR</p>	<p>I: Classroom curriculum for 4th–6th graders, consisting of skin cancer and UV protection education, lesson plans, inclass activities, take-home activities, newsletter, and dissemination suggestions for involving entire school C: No intervention</p>	<p>Children wear protective clothing in summer (single item; range 1–3): Absolute change: 0.37 Relative change: +27.6% ($p<0.05$, between) Children wear sunscreen in winter (single item; range 1–3): Absolute change: 0.18 Relative change: +13.55% ($p<0.05$, between)</p>
<p>Buller et al., 1999 Arizona RCT Greatest suitability Good quality</p>	<p>F/U: 2 months from B/L n = 159 Limitations: No descriptions of schools; convenience sample of volunteer schools and classrooms; childrens' self-reported outcome measures; no comparison of groups at baseline</p>	<p>Mean age: NR (Range: 9–11y) % Female: 53.7% Race/Ethnicity: 57% White; 36% Other (mainly Hispanic); 7% NR SES: NR</p>	<p>I-1: CD-ROM sun safety game and interactive activities, modified for grades 4 and 5, with children earning points on each activity I-2: Sun safety curriculum only, sun safety game and activities I-3: Sun-safety curriculum + CD-ROM C: No intervention</p>	<p>Child composite sun-protective behaviors (mean score, 13 items, 3-point scale): I-1: Absolute change: +0.07 Relative change: 3.5% I-2: Absolute change: +0.14 Relative change: 7.3% I-3: Absolute change: +14 Relative change: 7.2% Overall $p=0.074$</p>

<p>Buller et al., 1996 Arizona RCT Greatest suitability Good quality</p>	<p>F/U: 2 months from B/L n = 447 Limitations: Low participation rates; childrens' reports of own and of parents' behavior; group design and individual analyses may have overestimated significance</p>	<p>Mean age: Range 8– 10y % Female: 49% Race/Ethnicity: 63.7% White; 10.4% Hispanic; 2.8% African American; 15.6% Other; 7.4% NR SES: NR</p>	<p>I: Multidisciplinary curriculum on sun properties, composition of the skin, historic attitudes to tanning, and strategies to reduce sun exposure; included lesson materials, in-class and take-home activities, workbook, key term glossary, quick review, and newsletter C: No intervention</p>	<p>Children wear protective clothing in summer (mean score, 3-point-scale): Absolute change: +0.07 Relative change: +4.9% ($p=0.43$, between) Children lay in sun to tan (mean score, 3- point scale): Absolute change: -0.11 Relative change: +4.4% ($p=0.11$, between) Children play early or late when outside (mean score, 3-point scale) Absolute change: +0.12 Relative change: -6.3% ($p = 0.27$, between) Child composite sun-protective behavior (13 items, 3-point scale): Absolute change: +0.02 Relative change: +1.0% ($p=0.51$, between) Children wear sunscreen in summer (mean score, 2-item scale, 3-point scale): Absolute change: +0.04 Relative change: +1.8% ($p > 0.05$, between)</p>
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<p>Girgis et al., 1993 Australia RCT Greatest suitability Good quality</p>	<p>F/U: 8 months from end of I N=648 Limitations: Secular time</p>	<p>Mean age: 10y Female: 53% Race/ethnicity: NR SES: father-NR (53%); 32.6% low income; 15.3% high income</p>	<p>I-1: Standard: 30 minute didactic lecture focusing on dissemination of information; included posters and sunscreen samples I-2: Intensive: Skin Safe skin protection program incorporated into teachers' curriculum, consisting of cooperative learning techniques, student participation, problem-based strategies to promote awareness of problems and potential solutions associated with solar exposure, encouragement of students to develop responsibility for their own welfare by critically examining and improving their own environment C: No intervention</p>	<p>Child composite sun-protective behaviors (odds ratio using intervention groups as variable): I-1: Absolute change: -0.15 Relative change: -15.0% I-2: Absolute change: +2.06 Relative change: +206.0% Overall <i>p</i> value < 0.001</p>
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<p>Gooderham et al., 1999 Canada Before-and-after study Least suitable Good quality</p>	<p>F/U: 1 month from B/L n = 216 Limitations: Nonvalidated self-reported outcome measures; before-and-after study design with questionable use of analysis of variance statistical testing; potential for test-retest bias away from the null</p>	<p>Mean age: NR Range: (9–10y) % Female: 47% Race/Ethnicity: 90% White; 3% American Indian or Alaskan Native; 2% Asian; 2% East Indian; 1% Black; 2% Other</p>	<p>Sun awareness education program consisting of two 1-hour presentations, sun awareness activity booklet, sun safety workbook, take-home educational materials, and incentives</p>	<p>Child sun-protective behaviors (3-point scale): Always wear a long-sleeved shirt: Absolute change: +3.0 Relative change: +100.0% ($p<0.001$, within) Always wear long pants: Absolute change: +7.0 Relative change: +175.0% ($p<0.001$, within) Always wear hat when outside: Absolute change: +16.0 Relative change: +69.6% ($p<0.001$, within) Always wear sunscreen when outdoors in summer: Absolute change: +13.0 Relative change: +31.7% ($p<0.001$, within)</p>
<p>Hoffman et al., 1999 Florida Nonrandomized trial Greatest suitability Good quality</p>	<p>F/U: 2 weeks from end of I n = 181 Limitations: School size not described; convenience sample of schools; no validation of assessment tool; self-reported outcome measures</p>	<p>Mean age: NR (5th graders) % Female: 52% Race/Ethnicity: 81% White; 9% African American; 2% Hispanic; 8% Other SES: Based on Hollingshead 1975: 0% Strata 1; 6.5% Strata 2; 17% Strata 3; 38% Strata 4; 37% Strata 5</p>	<p>I: Lecture and interactive intervention given to 5th grade science classes to relay information on sun's effect on the skin, evaluate students' risks inherent in sun exposure, and promote change toward sunscreen use; included 10 minute ACS video, proper sunscreen application, student produced videotaped commercials emphasizing UV exposure dangers and methods to</p>	<p>Sunscreen use (visual analog scale, mean score): Absolute change: +17.6 Relative change: +148.7%</p>

			reduce, homework assignments, and brochures for parents C: No intervention	
Hornung et al., 2000 North Carolina RCT Greatest suitability Good quality	F/U: 7 months from end of I n = 192 Limitations: Extremely limited description of standard didactic presentation; no description of actual provision of the intervention; group rather than individual interaction with CD-ROM may have limited individual participation; no validation of behavioral measures	Mean age: 8.5y % Female: 44% Race/Ethnicity: NR SES: NR	I-1: CD-ROM sun safety game and interactive activities, modified for grades 3 and 4, supplemented by AAD pamphlets and information sheet I-2: Standard didactic sun safety curriculum	Child composite behavior (shade and sunscreen use) (100 point): I-1: Absolute change: -0.6 Relative change: -1.4% (<i>p</i> -value NR, between) I-2: Absolute change: -3.8 Relative change: -7.3% (<i>p</i> -value NR, between)

<p>Milne et al., 2000 Australia Nonrandomized trial Greatest suitability Good quality</p>	<p>F/U: 1.5y from baseline n = 1386 Limitations: Reliance on self-reported outcome measures</p>	<p>Mean age: 6y % Female: 48.2% Race/ethnicity: 9.7% Southern European ancestry; 90.3% other SES: parents—59.3% high school or less; 40.6% tertiary education</p>	<p>I-1: Moderate group received “Kidskin” curricula comprised of developmentally appropriate, learner-centered skill and outcome based materials, classroom and home-based activities, and guidelines for providing a sun-protective school environment I-2: High intervention group received same intervention as the Moderate group and were also mailed program materials over the summer holidays, offered low-cost sun protective swimwear, and were actively assisted to introduce and formalize policies to provide a sunprotective school environment C: Regional standard Western Australian Health Education curricula</p>	<p>Child sun-protective behaviors or assessments: Time spent outdoors during peak UV hours (adjusted mean): I-1: Absolute change: -4.3 Relative change: -8.3% I-2: Absolute change: - 6.1 Relative change: -21.6% ($p = 0.01$, between) Covered back entire time: I-1: Absolute change: +14.3 Relative change: +24.6% I-2: Absolute change: + 9.1 Relative change: +17.5% ($p = 0.001$; between) Wore hat entire time: I-1: Absolute change: -0.3 Relative change: -1.4% I-2: Absolute change: -3.3 Relative change: -6.3% ($p = 0.6$, between) Wore protective swimwear: I-1: Absolute change: +20.2 Relative change: +30.1% I-2: Absolute change: +5.9 Relative change: +11.3% ($p = 0.0005$, between) Use shade more than half the time: I-1: Absolute change: +10.2 Relative change: +31.2% I-2: Absolute change: +5.3 Relative change: +10.2% ($p=0.09$, between)</p>
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				<p>Composite observed sun exposure to face: I-1: Absolute change: -1.0 Relative change: +1.9% I-2: Absolute change: -3.1 Relative change: +26.1% ($p=0.006$, between) Composite observed sun exposure to forearm: I-1: Absolute change: -1.3 Relative change: +2.5% I-2: Absolute change: -4.5 Relative change: +23.6% ($p=0.008$, between) Composite observed sun exposure to back: I-1: Absolute change: -9.5 Relative change: +18.3% I-2: Absolute change: -14.0 Relative change: +33.6% ($p=0.002$, between)</p>
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AAD American Academy of Dermatology; ACS American Cancer Society; B/L baseline; C comparison; F/U follow up; I intervention; n sample size; NR not reported; RCT randomized control trial; SES socioeconomic status; UV ultraviolet; y year(s)