Multiple Levels of Influence in the Adoption of Sun Protection Policies in Elementary Schools in Massachusetts

Alan C. Geller, MPH, RN; Jodie Zwirn, MPH; Linda Rutsch, MBA, MPH; Sue A. Gorham; Vish Viswanath, PhD; Karen M. Emmons, PhD

Objective: To understand the factors that may influence sun protection policy development if the Centers for Disease Control and Prevention guidelines are to be realized.

Main Outcome Measures: Presence of school sun protection policies, sun protection curriculum, and communication portals for sun protection information to parents.

Design: Qualitative research methodology incorporating a socioecological framework using individual or small-group interviews, surveys, and environmental assessments with school superintendents, elementary school principals, elementary school nurses, and parent-teacher organization presidents and co-chairs as well as coding of school documents.

Setting: Elementary schools in Massachusetts.

Participants: Nine school superintendents, 18 elementary school principals, 18 elementary school nurses, and 16 parent-teacher organization presidents or co-chairs.

Results: None of the schools in the 9 districts had a sun protection policy, and only 1 had any type of sun protection curriculum. However, nearly all principals were receptive to developing sun protection policies and to making structural changes to increase the amount of accessible shade if funding were available.

Conclusions: The schools’ communication infrastructure could provide a key portal for disseminating sun protection information to parents. Although there are other resources that could be brought to bear, many challenges must be surmounted to develop effective sun protection policies.

Arch Dermatol. 2008;144(4):491-496

©2008 American Medical Association. All rights reserved.

For editorial comment see page 538

Herein, we report on the status of skin cancer prevention policies and curriculum in elementary schools in Massachusetts. Because our goal was to look at all of the possible influences on policy adoption and implementation, we examined multiple levels of influence, including the superintendents, principals, nurses, and parent representatives to schools’ parent-teacher organizations (PTOs). We used the Social Ecological Model to guide the development of the survey because it examines interpersonal (eg, beliefs and attitudes), interpersonal (communication), and organizational level (eg, budget, workload, and school infrastructure) factors. We also conducted in-depth
Table. School Officials’ Suggestions for Improving Sun Protection Policies in Massachusetts Schools

<table>
<thead>
<tr>
<th>Social Ecological Framework Domains</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational</td>
<td>Integrate sun protection information into health, physical education, or science courses</td>
</tr>
<tr>
<td>Curriculum</td>
<td>Design school-wide bulletin boards</td>
</tr>
<tr>
<td>Environment/scheduling</td>
<td>Plant trees</td>
</tr>
<tr>
<td></td>
<td>Build shade structures</td>
</tr>
<tr>
<td></td>
<td>Work shade into new construction and renovation plans</td>
</tr>
<tr>
<td>Community</td>
<td>Integrate sun protection information for:</td>
</tr>
<tr>
<td></td>
<td>Kindergarten screening</td>
</tr>
<tr>
<td></td>
<td>Awareness programs via recreational programs, civic organizations, and youth sport teams</td>
</tr>
<tr>
<td></td>
<td>Community health fairs</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Request parents to send sunscreen to school</td>
</tr>
<tr>
<td>Sunscreen</td>
<td>Have school supply of sunscreen pumps</td>
</tr>
<tr>
<td></td>
<td>Incorporate questions regarding sun sensitivity and sunscreen allergies into student health forms</td>
</tr>
<tr>
<td>School staff</td>
<td>Provide education and resources to improve sun protection for staff</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Include sun protection information in notes to parents and for field trip reminders</td>
</tr>
<tr>
<td>Communication</td>
<td>Request parents to apply sunscreen to students at home before school</td>
</tr>
<tr>
<td></td>
<td>Obtain parental permission for over-the-counter medication to include sunscreen</td>
</tr>
</tbody>
</table>

interactions in each of these target groups in 9 randomly selected school districts, stratified by the town's median income level. The goal was to inform the development of a statewide policy for elementary schools on skin cancer prevention among young children.

METHODS

RECRUITMENT AND SCHOOL DISTRICT SELECTION

We received a list of the 381 Massachusetts school districts from the Department of Education and categorized them into 9 groups by student enrollment (low, medium, and high) and income (low, medium, and high). We randomly chose 1 school district from each of the 9 groups to participate in the study. An introductory letter was sent to the superintendents of these districts inviting them and other key school personnel to participate in interviews regarding skin cancer prevention. Seven district leaders or their representatives refused to take part in the study, uniformly citing lack of time as the most common reason. Each time we received a refusal, we asked another school district from the same income or enrollment grouping. In all, 16 districts were contacted, to obtain a final sample of 9 districts. Only 1 of the 9 school districts used in the study was near a beach town; likewise, only 1 of the 7 school districts that did not take part in the study was near a beach town.

The median household income of the town ranged from less than $48,000 (low), to $48,000 to $61,000 (middle), to $61,000 or more (high). The number of elementary schools within a district ranged from 1 to 5 (mean, 2). The school size ranged from 196 to 995 students, with an average of 498 students. The percentage of low-income families within each district ranged from 1.8% to 34.1%. Ninety-four percent of the students in the 9 districts were white.

Within each district, we chose to interview representatives of elementary schools since our goal was to understand the factors that influence elementary school policy. We conducted individual interviews or group discussions with each district’s superintendent, elementary school principal, elementary school nurse, and PTO (or group equivalent) president. Within each district, all the principals participated. If more than 1 principal or school nurse from a district participated, they met at a common location within the district. No individuals refused to be interviewed.

The study was described, and verbal consent was received from all participants. Key informant interviews were audiotaped and professionally transcribed. Institutional review board-approved interview guides were used. The interview guides were pretested with a superintendent, school nurse, principal, and PTO representative in a pilot town and modified before full implementation. All interviews were conducted either individually or with 2 participants, including a total of 9 school superintendents, 18 elementary school principals (6 individually and 6 with 2 participants), 18 elementary school nurses (all with 2 participants), and 16 PTO presidents or co-chairs (2 individually and 7 with 2 participants). Qualitative methods, such as key informant interviews, were designed to explore specific concepts in depth to learn how individuals experience their world. These methods are increasingly being used in community-based research to ensure that the perspective of the target audience is considered in intervention development. The application of qualitative methods (1) can lead to a greater understanding of concepts than survey research, (2) is used to generate ideas and areas for further quantitative inquiry, and (3) has been shown to result in enhanced improved programs and services. Data were collected between January and March 2005.

MEASURES

Three domains from the Social Ecological Model—organizational, intrapersonal, and interpersonal—were measured in 4 different ways (Table). Data were gathered on 4 dimensions of schools’ sun-protection policies: (1) a brief survey inquiring about the existence of any current policies and/or curriculum involving sun protection (completed by nurses and principals); (2) a school-wide environmental assessment of sun protection (completed by school principals); (3) individual and group interviews conducted with superintendents, principals, nurses, and PTO leaders; and (4) collection of newsletters, handbooks, blank health forms, and example permission slips to evaluate what sun protection information was available.

Survey of Current Policies

Questions were asked about the presence of a sun protection policy or curriculum, the person who is responsible for implementing the curriculum, and the school’s willingness to develop a policy or to make structural changes to increase the amount of shade.

Environmental Assessments

Questions were asked about the hours during which outdoor activities were held, presence of shade structures, proportion of outdoor space that is sheltered, proportion of outdoor space...
that is sheltered by trees, presence of planted trees on the playground, likelihood that new growth of existing trees will result in additional shade, and likelihood of structural changes if funds were available.

**Individual and Small Group Interviews**

During each interview, the researcher asked the participants a series of questions related to their experience with school-based prevention policies and about their attitudes and beliefs regarding the school's role in sun protection.

Superintendents were asked about (1) organizational issues (particularly the relationship between the offices of the district and the principal regarding school policy, the role of the school board, and the maintenance of the school grounds); (2) policies (the adoption of prior prevention policies and the processes used and problems encountered in policy adoption, as well as the district's process and the community's reaction to the implementation of previous policies, such as tobacco); (3) whether increased sun protection had been requested, whether there had been teacher complaints about sun exposure, and what the process required to implement a sun protection policy would be; and (4) whether the district had a skin cancer prevention curriculum and was willing to consider the inclusion of shade structures or trees in future renovations and/or construction designs.

Principals were asked about (1) organizational issues (where school policy was set, the role of the PTO, whether the school had a discretionary budget, and maintenance of the school grounds); (2) policies (adoption of prior prevention policies and the processes used and problems encountered in policy adoption); (3) concerns about skin cancer, skin cancer prevention among parents and teachers, and whether there had been teacher complaints about sun exposure; (4) the degree of personal priority for skin cancer compared with other issues in the school; and (5) the school's openness to policies as well as perceptions regarding parent, teacher, and student receptivity to sun protection policies.

Nurses were asked about (1) the process, development, and implementation required to implement a sun protection policy; (2) whether the district had a skin cancer prevention curriculum and how it was implemented; (3) the level of concern about skin cancer prevention among parents and teachers; (4) the degree of personal priority regarding skin cancer compared with other issues in the school; and (5) their perception of parent, teacher and student receptivity to new policies.

The PTO presidents were asked about (1) the role of the PTO in the school; (2) strategies for fundraising, allocation of funds raised, and whether the PTO had a discretionary budget; (3) the level of concern about skin cancer prevention among parents; (4) the degree of personal priority regarding skin cancer compared with other issues in the school; (5) receptivity to new policies; and (6) what role the PTO could play in developing a skin cancer prevention policy or in raising funds for implementation.

**School Materials**

At each school, we were provided with currently used school forms, such as newsletters, handbooks, blank health forms, and example permission slips, to evaluate what sun protection information, if any, was already included and to identify opportunities for the addition of sun protection components.

**Analysis of Interviews**

The data analyses followed a systematic process in which the transcripts were read through as text for general familiarity with content and to identify broad themes. After the general thematic domains were identified, the texts were subjected to systematic, line-by-line coding based on an initial, theory-driven code list. An NVivo software package (QSR International, Cambridge, Massachusetts) was used to facilitate the qualitative data analysis. Two staff members with experience in qualitative methods coded the information, and discrepancies were addressed and resolved. We did not do a formal rating of reliability but resolved any of the few discrepancies in coding before moving ahead with the analyses.

**Results**

**Presence of Sun Protection Policies and Environmental Assessments**

Of the 18 schools in 9 districts, none had a sun protection policy or procedure at either the school or the district level. Only 1 school had any type of sun protection curriculum. However, nearly all principals were willing to develop a policy and to make structural changes to increase the amount of shade if funding were available. Of the 18 principals reporting, 17 stated that outdoor activities took place between hours of peak sun exposure (10 AM to 2 PM). Only 7 schools had shade structures, and among these, only 1 structure provided protection for more than 20% of the outdoor space. Two-thirds of the schools had planted trees, but they rarely provided protection for more than 20% of the school outdoor space.

**Attitudes Toward Sun Protection Policies**

Overall, skin cancer prevention was not a high priority relative to other health issues. Most school personnel, however, expressed an interest regarding ways in which they could be informed about plans to make their schools and children more sun safe. When asked the reasons why schools do not currently have any policy concerning sun protection, school personnel stated that it was a low priority (except for field days or field trips) because of the students' limited time outdoors and the lack of funding for health classes.

School personnel (superintendents and principals) were asked whether they would be receptive to developing and implementing sun protection policies in their schools. Although they were generally receptive, a number of barriers were noted. Concerns ranged from teachers and parents being too overwhelmed to make the effort to finding the funding to implement such a project. Overall, there was openness to the idea of developing a few basic practices. However, concerns were expressed about the term policy, which implied legislative mandates and broader governmental regulation. It was suggested that schools would be more likely to adopt sun protection practices rather than policies.

In the next section, we report on specific suggestions for policy changes. A summary of recommendations for improving the infrastructure for schools and districts is shown in the Table.

**Curriculum**

School personnel suggested integrating sun protection information into health education, physical education,
or science courses. Other ideas for teaching sun safety included hosting an assembly, displaying posters throughout the school, having the nurse’s office coordinate a health week, designing a bulletin board to include year-round sun protection information, and adding questions on sun protection for the new state-wide standardized testing. Challenges included determining who would be able to teach the curriculum because of the minimal amount of free teaching time, what grades should be taught, what lessons should be chosen, and how often the curriculum should be implemented.

ENVIRONMENT

Ideas for improving the sun protection potential of the school environment included planting trees, building shade structures, and working shade into new construction and renovation plans. Basic strategies could include seeking donations from local tree farms and garden clubs for plantings and purchasing umbrellas for picnic tables and pop-up canopies for temporary shelters. Other ideas included announcing the UV Index and using it as a determinant for outdoor activities and conducting a shade assessment for the school environment. Budgets and costs were the main concerns for expanding outdoor shade. Most schools found it unrealistic to be able to do anything significant to alter the amount of shade. Participants also raised questions about where the trees or structures could be located and whether playgrounds could be constructed with more shade structures.

SCHEDULING

Ideas for different scheduling options to avoid the 10 AM to 2 PM time period were limited. Scheduling issues ranged from figuring out the time for application of sunscreen, the limited amount of time students actually spend outside, and the lack of flexibility concerning changing recess and gym schedules. Overall, the main concern focused on the fact that schools report that they are bombarded with “extras” that they are being asked to take on during a very limited amount of time and with a limited amount of resources. Several participants also expressed the belief that the amount of sun exposure during the school day was so limited that it did not pose a significant risk.

COMMUNITY

There are several opportunities for integrating sun protection information within the community, whether it takes place within the school environment or outside the school. Suggestions included kindergarten screening, educational awareness programs for parents, community health fairs, and educational awareness by means of recreational programs, civic organizations, and youth sports teams. Participants raised drawbacks such as low attendance at many community education events and the perceived low priority of skin cancer prevention within most families.

SUNSCREEN

Suggestions for sunscreen use included requesting students to bring in their own sunscreen or having the school provide sunscreen pumps for individual classrooms, with teachers encouraging sunscreen use before outdoor activities. Alternative ideas included requesting parents to apply sunscreen to their children before they left for school and incorporating questions regarding sun sensitivity and sunscreen allergies to the student health intake forms. Many challenges were raised regarding the use of sunscreen in school. Availability and efforts by teachers and nurses to encourage sunscreen application before outdoor activities caused concerns. Other concerns raised by school personnel included teachers monitoring sunscreen application, teachers touching children to help with application, students sharing sunscreens, sunscreen allergies, parental permission for sunscreen use, and sunscreen expense.

SCHOOL STAFF

Providing education and resources is imperative to improve sun protection practices for staff. Health educators, physical education teachers, nurses, and regular classroom teachers were mentioned as providers and role models for sun protection information and practices. Another issue involves the liability of school staff in the event of sunburns, sunscreen allergies, and the necessity of parental permissions for sunscreen use.

COMMUNICATION

A key issue in the implementation of sun protection policies would be how to communicate with parents about policy implementation. School personnel noted several outlets to facilitate communication with parents, including newsletters with information from the principal, nurses, and the PTO regarding sun protection reminders and information. The school handbook could also incorporate suggestions about appropriate clothing and weather gear. All schools did report that they currently included reminders in newsletters and handbooks about the importance of wearing appropriate winter clothing. Other suggestions involved field trip or field day permission slips noting appropriate sun protection gear, the school Web site, hosting informational speakers for parents, coordinating school health fairs, and other resources such as local cable access, local newspapers, and town-wide messaging systems. Parental participation presented a major challenge.

SCHOOL FORMS AND MATERIALS:

Overall, we reviewed 18 health forms, 15 newsletters, 12 handbooks, and 9 permission slips, 5 of which made mention of sun protection. Four references were included in parent notices regarding school field trips. The remaining reference was an end-of-the-year newsletter that included reminders for parents about the dangers of unprotected sun exposure. Because little information was included in these forms, we used the individual and group interviews to explore new suggestions.
In this study of 9 representative school districts in Massachusetts, notably no schools had a sun protection policy, despite the fact that 95% of schools had recess during peak sun exposure time. Only 1 school had a substantial sun protection curriculum. However, nearly all principals were receptive to developing sun protection policies and to making structural changes to increase the amount of shade available if funding were available.

In 2002, the CDC Guidelines for School Programs to Prevent Skin Cancer issued 7 policy recommendations for schools to reduce skin cancer risks: creation of physical, social, and organizational environments that facilitate protection from UV rays; education of young persons; professional development; involvement of families; health services; and program evaluation. This current study was conducted 3 years after the release of CDC’s school guidelines and addressed each of the 7 recommendations with school policy makers.

Earlier studies documented suboptimal adoption of school-wide sun protection policies. In 1998, a random sample of 412 US public elementary schools found that only 3.4% of schools had a sun protection policy even though most principals (84%) said that students were outdoors during midday hours. The most common reasons for not having a policy included the principal’s lack of awareness (n=113) or organizational barriers in the school district (n=77).

More recent regional surveys have confirmed the very low level of implementation of school sun protection policies. In Hawaii, only 1 school had a written school policy, and 99% of the schools scheduled outdoor activities during peak sun hours. School uniforms rarely included long pants (6.5%), long-sleeved shirts (5.1%), or hats (1.5%). However, almost one third of those surveyed were in favor of a statewide policy (28.1%). A survey of school officials in Miami-Dade County conducted 7 years after implementation found that 78% knew about the county school system’s guidelines for avoiding excessive heat exposure. Although 1 of the 2 recommendations was to participate in statewide meetings of superintendents, principals, and building maintenance personnel would serve as important awareness-building vehicles. The previously mentioned CDC report also describes other potentially successful interventions, including sun safety fairs, community-wide efforts, family and caregiver interventions, changes in the school environment, and alignment with local health professionals.

The US Environmental Protection Agency’s successful incorporation of SunWise teaching in US schools provides a potential building block for policy implementation. In particular, assisting school nurses at SunWise schools via the use of a Web-based platform or personal advice to target 1 or 2 easy-to-achieve policy changes might be a viable first option. Web-based technical assistance has been used by local tobacco control staff, and an enhanced Web site compared with a basic Web site led to more visits by principals who were seeking sun protection curriculum information. Successful implementation of sun protection policies should be tested by comparing school-based, bottom-up approaches with those at the district or state level.

The optimal sun protection strategy for schools in states such as Massachusetts that do not have year-round high UV levels must be explored. Scheduling recess during peak sun hours in the cooler months (November-March) is reasonable; however, UV levels of at least 4 to 5 (moderate) occur in April and October and can increase to 6 to 7 in September, May, and June. For moderate levels of exposure, Americans are warned to take precautions such as covering up and to stay in the shade near midday, when the sun is strongest. Therefore, permanent or modular shade structures and the provision of sunscreen are at least 2 reasonable components of a sun protection strategy, even in states such as Massachusetts.

Our study had some limitations. First, although administrators and nurses raised concerns about the lack of funding for such programs, we did not engage in detailed discussions on ways other than local fund-raising initiatives to raise money for such efforts. Second, future discussions with school officials should also involve administrators in charge of building maintenance, thereby increasing their priorities for sun protection. Also, automated telephone messaging systems could be used to alert parents in advance of especially high UV alert days or other days with a high UV index. Mobilizing parents and faculty is a vital step in seeking funding from local school boards for relatively inexpensive structures and awnings to provide maximal coverage during school recess and after-school activities.

The US Environmental Protection Agency’s SunWise Program, which now serves more than 14,000 US schools in all 50 states, has been an important model for integrating sun protection education in US schools. Faced with feedback from school principals that sun protection education was among the lowest of their health education priorities, the SunWise Program has successfully incorporated sun protection teaching as part of standard lessons in science, social studies, mathematics, health, and physical education. Presentations of specific policy action plans to statewide meetings of superintendents, principals, and building maintenance personnel would serve as important awareness-building vehicles. The previously mentioned CDC report also describes other potentially successful interventions, including sun safety fairs, community-wide efforts, family and caregiver interventions, changes in the school environment, and alignment with local health professionals.
ence, particularly outdoor areas. Third, although districts were randomly chosen to represent a cross-section of schools by income and enrollment, we interviewed leaders from only 9 districts, which might not represent all school districts in the state. Also, although it is possible that districts that agreed to participate would have been more predisposed to adopt a sun protection policy, the fact that none of the 18 schools in the 9 districts had a sun protection policy in place slightly mitigates this concern. Fourth, while we did not formally attempt to validate the responses, principals and nurses responded similarly to questions on the presence of sun protection policies. Finally, while none of the schools had a sun protection policy, nearly all of the respondents expressed a willingness to adopt such a policy. There is always the possibility that some of the participants provided socially desirable responses to the interviewers.

In conclusion, there are many challenges that must be surmounted before effective sun protection policies can be developed. Organizations led by the National Council on Skin Cancer Prevention, a national umbrella group of many skin cancer organizations, and others, must map out a strategic plan and seek counsel from other school models for policy development, such as the banning of tobacco on schools grounds. Potentially convergent strategies for developing and disseminating effective school-wide policies include seeking comprehensive guidelines from state-based departments of public health and education, while concurrently leading initiatives at the district level. Resources are limited, but successful implementation of sun protection policies in “early-adopter” districts “makes the case” to statewide policy makers that parents and school leaders can effectively forge new policies.

Accepted for Publication: November 10, 2007.

Correspondence: Alan C. Geller, MPH, RN, Department of Dermatology, Boston University School of Medicine, 720 Harrison Ave, DOB801A, Boston MA 02118 (ageller@bu.edu).

Author Contributions: Mr Geller had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Geller, Rutsch, Gorham, Viswanath, and Emmons. Acquisition of data: Zwirn. Analysis and interpretation of data: Geller, Zwirn, Viswanath, and Emmons. Drafting of the manuscript: Geller, Zwirn, and Viswanath. Critical revision of the manuscript for important intellectual content: Geller, Rutsch, Gorham, and Emmons. Obtained funding: Gorham and Emmons. Administrative, technical, and material support: Zwirn. Study supervision: Geller, Gorham, and Emmons.

Financial Disclosure: None reported.

Funding/Support: This study was supported in part by the Curt and Shonda Schilling SHADE Foundation.

REFERENCES