



Impact of a Youth Sun Safety Educational Program

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ABSTRACT **Introduction:** Sun protection early in life is necessary to prevent skin cancer. Therefore, youth sun safety education is imperative. However, such programs have often failed to bring about behavioral change in youths.

Objectives: We evaluate a sun safety educational program's effectiveness in improving elementary school students' knowledge of sun safety, confidence in their ability to explain the importance of sun protection, and their understanding of sunscreen labels.

Methods: A 1.5-hour program was conducted for the fourth-grade students. Forty-five of the 53 students participated in the study and completed the pre- and post-surveys, a response rate of 84%. These surveys were identical, consisting of four questions rated on a Likert scale to assess changes in the students' knowledge, confidence, and understanding regarding sun protection.

Results: The students overall had a statistically significant increase in their knowledge of sun safety and sun protective measures, confidence in their ability to explain the importance of sun protection, and their understanding of sunscreen labels.

Conclusions: In alignment with the current literature, this study demonstrates the importance of school-based sun safety programs and notably shows that such programs can increase youths' understanding of sunscreen labels and confidence in explaining the importance of sun protection. It is our hope that the program will cause increased practice of sun protective behaviors among the students. Further research is needed to determine how effective such programs are in increasing the practice of sun protective behaviors in youths.

Introduction

Skin cancer is the most common type of cancer affecting 1 in 5 Americans and diagnosed in 9,500 people a day [1–3]. The increasing rate of skin cancer is a major public health concern. Sun exposure during childhood and adolescence can play a major role in skin cancer development as an adult [4]. Nearly 23% of a person's lifetime sun exposure occurs by the time they turn 18 years of age [5]. Children, who often spend a substantial amount of time outdoors for activities and school recess, have an increased risk for excessive sun exposure [6,7]. Although largely preventable, melanoma has significant morbidity and mortality and is increasingly affecting adolescents and young adults [8]. Sun protection early in life is necessary for primary prevention of skin cancers. As such, sun safety education for children is essential to minimize their risk factors for skin cancer development. Additionally, photoprotection is beneficial for youths as they may be exposed to antibiotics and other medications, such as treatments for acne, that are photosensitizing [9,10]. Most youth educational programs promoting sun safety have focused on teaching that sun exposure increases the likelihood of skin cancer and that certain protective measures can mitigate this risk. Such programs have been somewhat successful in improving sun safety knowledge; however, they have often failed to bring about behavioral change in youths [11].

Objectives

We implemented a sun safety educational program at a Baltimore City, Maryland elementary school with the goal of improving students' knowledge of sun safety and increasing their practice of sun protective behaviors. The program incorporated educational material from the American Academy of Dermatology's youth education program, Good Skin Knowledge. We hypothesize that, as a result of this educational program, the participants will have improvement in their knowledge of sun safety and sun protective measures, confidence in their ability to explain the importance of sun protection, and their understanding of sunscreen labels. In this study, we evaluate the program's effectiveness in improving the aforementioned variables in elementary school students.

Methods

Study Population

Our sun safety educational program was implemented at an elementary school in Baltimore City, Maryland that has a student enrollment of 555. The school serves a predominantly minority student population with 54% of the fourth-grade class being Black/African American, 34% being Hispanic/

Latino, 5% being White, and the remaining 7% being Asian, American Indian or Alaska Native, Pacific Islander, or two or more races. Approximately 96% of students receive free or reduced-cost lunches, 11% are designated as gifted and advanced, 6% are in special education, and 18% are English as a second language learners. The target population for the program was fourth-grade students. 45 of the 53 fourth-grade students who were present on the day of the sun safety education program participated in the study.

Program Implementation

The interactive sun safety education program was conducted during a 1.5-hour assembly. The program included an explanation of the sun's effect on the skin and the importance of daily sun protection, a session on sun protective behaviors, and a session dedicated to sunscreen: understanding sunscreen labels and how to use sunscreen effectively. Students volunteered and were called on to share any experiences of sun burn or skin changes due to long periods of sun exposure, sun protective behaviors that they know of, and their experiences with sunscreen. During the sunscreen education session, students took turns going through different sunscreens to identify the SPF, water-resistance period, and broad-spectrum status of each sunscreen. All program components are available from the authors on request.

The students were invited to complete pre- and post-program surveys, each of which took five minutes. Consent was obtained by participants completing a form at the beginning of both surveys. The surveys were completed anonymously and voluntarily. This study was reviewed and deemed exempt by the University of Maryland Institutional Review Board. There were no risks or potential to be harmed in this survey study.

Outcomes Measured and Data Analysis

Forty-five out of 53 fourth-grade students completed the pre- and post-surveys, a response rate of 84%. These surveys were identical, consisting of four questions rated on a Likert scale to assess changes in the students' sun safety knowledge, confidence in explaining the importance of sun protection, and understanding of sunscreen labels. Survey forms were collected and responses were stored anonymously on Microsoft Excel. Statistical analysis was done using a paired two-sample t-test on Microsoft Excel. A P value less than 0.05 was deemed significant.

Results

Using a 1-5 Likert scale, we assessed the 45 fourth-grade students' sun safety knowledge, confidence in explaining the importance of sun protection, and understanding of sunscreen labels before and after our program. The survey questions and Likert scale response choices can be seen in Table 1.

Table 1. Pre- and post-survey questions and response choices. A “5” on the Likert scale (1-5) is considered the highest level of knowledge, confidence, or understanding

How knowledgeable are you about the importance of sun safety?	What is your level of confidence in your ability to explain the importance of sun protection to others?
1 – Not at all knowledgeable	1 – Very low
2 – Slightly knowledgeable	2 – Low
3 – Somewhat knowledgeable	3 – Moderate
4 – Moderately knowledgeable	4 – High
5 – Extremely knowledgeable	5 – Very high
How knowledgeable are you about ways to protect your skin from sun damage (when outside on a sunny day, for example)?	How would you describe your understanding of sunscreen labels?
1 – Not at all knowledgeable	1 – Poor
2 – Slightly knowledgeable	2 – Fair
3 – Somewhat knowledgeable	3 – Good
4 – Moderately knowledgeable	4 – Very good
5 – Extremely knowledgeable	5 – Excellent

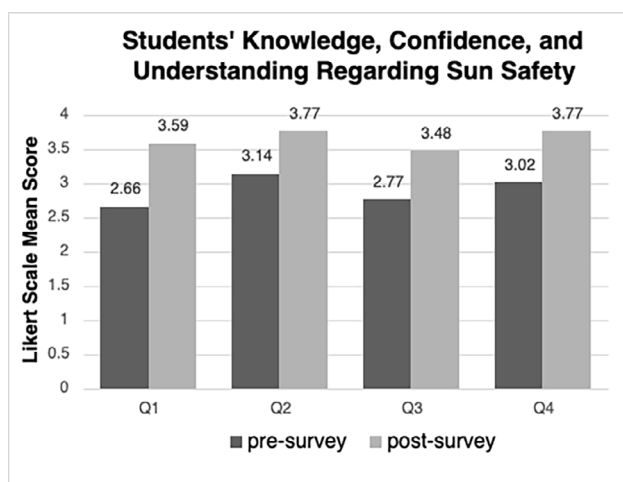


Figure 1. Graphical demonstration of the change in the students’ sun safety knowledge, confidence in explaining the importance of sun protection, and understanding of sunscreen labels before and after participating in the sun safety education program.

Figure 1 and Table 2 illustrate the comparison between pre- and post-survey responses. The mean values for the responses to the pre-survey questions were 2.66, 3.14, 2.77, and 3.02 respectively. The mean values for the responses to the post-survey questions were 3.59, 3.77, 3.48, and 3.77 respectively. P values were less than 0.001.

Conclusions

The goal of our program was to improve sun safety knowledge and increase sun protective behaviors among the fourth-grade students to ultimately help minimize their risks for skin cancer. As a result of our educational program, the

Table 2. The students’ sun safety knowledge, confidence in explaining the importance of sun protection, and understanding of sunscreen labels before and after participating in the sun safety education program

	Pre-Survey mean	Post-Survey mean	P-value
How knowledgeable are you with the importance of sun safety?	2.66	3.59	P<0.001
How knowledgeable are you about ways to protect your skin from sun damage (when outside on a sunny day, for example)?	3.14	3.77	P<0.001
What is your level of confidence in your ability to explain the importance of sun protection to others?	2.77	3.48	P<0.001
How would you describe your understanding of sunscreen labels?	3.02	3.77	P<0.001

students overall had a statistically significant increase in their knowledge of sun safety and sun protective measures, confidence in their ability to explain the importance of sun protection, and their understanding of sunscreen labels. To our knowledge, this study is the first to show that such programs

can increase youths' understanding of sunscreen labels and confidence in their ability to explain the importance of sun protection. We hope that with increased knowledge of and familiarity with sun protective measures such as sunscreen, wide-brim hats, and avoiding being outside during peak hours, the students will make behavioral changes accordingly. The results of this study suggest that a simple, cost-effective educational intervention can greatly increase youths' knowledge and confidence regarding sun safety. In our group of elementary students, the American Academy of Dermatology's Good Skin Knowledge program was an effective template to use in educating and empowering youths.

These findings add to a growing body of support for youth education programs that promote sun protective behaviors and help reduce skin cancer risks. Similar studies assessing the effectiveness of school-based sun safety programs have also reported positive pre- to post-program changes in knowledge, as well as in behavioral intentions and attitudes regarding sun safety [12–14]. One challenge of sun safety educational interventions is that children still participate in high-risk sun behaviors despite being knowledgeable about the risks of prolonged sun exposure [15]. Although the students in our study had on average a medium level of knowledge about sun safety and sun protective measures at baseline, only 17% of the students had ever worn sunscreen during outdoor sports and activities compared to the 60% that had worn sunscreen for beach or pool activities. Skin cancer prevention programs need to focus on connecting specific behaviors (eg staying in the shade and wearing sunscreen) to the sun safety knowledge, and not only imparting the importance of sun safety.

Methods to improve sun safety in schools include doing an initial analysis of sun exposure during outdoor activities at school, having protective pavilions and tree-covered areas so that students are protected from the sun during recess and outdoor gym sessions, and making sunscreen available in the classroom, nursing office, and gym so it can be applied before outdoor activities. Some schools in Maryland are already implementing these initiatives, but not enough.

The strengths of this study are that the program was tailored to the age of the target population, the study group was racially and ethnically diverse, and the interactive nature of the program held the participants' attention. This study is limited by its small sample size, lack of a validated survey instrument, lack of a control group, and the fact that the researchers were present while the participants completed the surveys. Another limitation is that we did not conduct an objective assessment of the change in the students' knowledge of sun safety and sun protective measures, confidence in their ability to explain the importance of sun protection, and their understanding of sunscreen labels.

This study of a sun safety educational program in youths shows a statistically significant improvement in their knowledge of sun safety and sun protective measures, confidence in their ability to explain the importance of sun protection, and their understanding of sunscreen labels. This study adds to the current literature that has demonstrated the importance of school-based sun safety programs. It is our hope that this program will result in increased practice of sun protective behaviors among the students and subsequently improve dermatologic health outcomes. Further research is needed to determine how effective such educational programs are in increasing the practice of sun protective behaviors in youths. In the future, we plan to survey the fourth-grade class to determine if there were changes to their practice of sun protective behaviors. We also hope that this study can inform future legislation and school-based initiatives focusing on sun safety and sun protective behaviors in children.

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