Sun Smart Schools
2016-2017 School Year Findings

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NEVADA CANCER COALITION

Contents

Background & Introduction

Nevada Sun Smart Schools Program

The Nevada Cancer Coalition (NCC) is responding to the US Surgeon General's 2014 Call to Action to Prevent Skin Cancer by implementing the Sun Smart Nevada program. Part of this program includes the Sun Smart Schools program, which was launched in 2015 and developed to establish positive sun safety habits in children, teens, and across the community to lower skin cancer incidence in the state (NCC, 2017). The pilot program in the 2015-2016 school year was adopted by 7 schools across Nevada, and during the 2016-2017 school year the program grew to 22 schools, including the entire Douglas County school district. Schools participating in the 2016-2017 school year are shown in Table 1.

Table 1. Participating schools in the 2016-2017 Sun Smart Schools Program by county

Douglas County	Clark County
CC Meneley Elementary School	Rogers Elementary School
Gardnerville Elementary School	St. Viator Parish School (K-8)
Jacks Valley Elementary School	The Meadows School
Minden Elementary School	**Storey County**
Pinon Hills Elementary School	Virginia City High School
Scarselli Elementary School	Virginia City Middle School
Zephyr Cove Elementary School	Hillside Elementary School
Carson Valley Middle School	Hugh Gallagher Elementary School
Pau-Wa-Lu Middle School	**Washoe County**
Aspire Academy High School	SRUMC Preschool
Douglas High School	Elizabeth Lenz Elementary School
Whittell High School	Pine Middle School

Schools were encouraged to adopt free, evidence-based curriculum and incorporate it into existing lessons. Students in grades K-8 were exposed to the SunWise curriculum developed by the Environmental Protection Agency (EPA), a program currently used at 40,000 schools and educational organizations nationwide (NCC, 2017). Materials in this program facilitate cross-curricular learning about sun safety, UV radiation, and ozone science. Students in grades 7-12 were provided with the Sun Smart U curriculum developed by the Skin Cancer Foundation. These lesson plans can be taught in one or two class periods and feature true stories from young skin cancer survivors, prevention guidelines, handouts, and activities. For students in grades K-1, additional curriculum titled Ray and the Sunbeatables™ is available from CATCH Global Foundation. This program features superhero characters who teach and engage

children about sun safety. Parents were provided with newsletters that contained sun safety information and recommendations for sun safety practice.

In addition to curriculum, participating schools are encouraged to adopt written policies for sun safety that include promotion of sunscreen use, approval of sun protective clothing like hats on campus, and access to shade structures or trees. The NCC staff was also available for in-person presentations at participating schools to talk about sun safety practices and had a network of community members including meteorologists, scientists, and melanoma survivors who were available to talk about their experiences and knowledge.

A new addition to the program in the 2016-2017 school year was providing automatic sunscreen dispensers and sunscreen pouches to 17 participating schools. The sunscreen was allergen-free and dispensers were placed in locker rooms and hallways at schools to provide students easy access to sunscreen before going outside.

Survey Design and Distribution

During the 2015-2016 school year, the Sun Smart Schools program was piloted and results showed it was effective in increasing UV protective knowledge, attitudes, and behaviors among elementary and middle school students. High school students and parents increased some protective behaviors, but maintained a positive attitude toward tanned skin after the intervention. A limitation to the analysis in the pilot year was in the limited information the surveys captured. Surveys for the 2016-2017 year were expanded to include demographic indicators including gender, race, and grade, and additional knowledge- and attitude-based questions were added to obtain a more comprehensive understanding of the program outcomes. Also new this year, surveys were distributed to staff at participating schools to understand changes in their sun-safety behaviors, as well as the utility and use of the provided curriculum.

Four separate surveys were developed for Elementary and Middle school students, High School Students, Parents, and Educators and Administrators (will be further referred to as Educators). Surveys asked similar questions but contained age and reading-level adjustments. Appendix I-IV contains the survey questions used for each group at pre- and post- survey. Surveys were distributed in two ways. The pre-intervention survey was provided both on paper for in-class distribution as well as online through SurveyMonkey. Post-intervention surveys were only distributed online through SurveyMonkey. Post-intervention responses were much lower than pre-intervention responses (4,357 responses at pre-survey and 926 at post), likely due to teachers not providing designated in-class time for students to complete the surveys and students not asking their parents to fill out the online survey. Table 2 shows a breakdown of responses by school and survey-taker at pre- and post-intervention.

Table 2. Pre- and Post-intervention responses to the 2016-2017 Sun Smart Schools survey by school and participant

	Pre-survey (n= 4,357)				Post-survey (n= 926)			
School	EMS	HS	Parent	Staff	EMS	HS	Parent	Staff
Aspire Academy High	0	1	0	0	0	0	1	1
CC Meneley Elementary	138	0	124	1	42	0	11	4
Carson Valley Middle	423	0	30	12	3	0	2	0
Douglas High	0	239	78	39	0	0	55	0
Gallagher Elementary	49	0	0	1	22	0	36	3
Gardnerville Elementary	73	0	51	1	6	0	1	16
Hillside School K-8	10	0	0	0	0	0	0	0
Jacks Valley Elementary	125	0	32	16	1	0	1	1
Lenz Elementary	77	0	30	1	2	0	0	0
Minden Elementary	50	0	85	0	0	0	4	0
Pau-Wa-Lu Middle	56	0	38	30	36	0	29	23
Pine Middle	533	0	91	21	226	0	59	9
Pinion Hills ES	133	0	153	0	0	0	3	1
Rogers Elementary	253	0	107	20	203	0	5	24
Scarselli Elementary	86	0	211	18	0	0	8	1
South Reno UMC Preschool	0	0	19	2	0	0	0	0
Sparks Middle	128	0	0	0	0	0	0	0
St. Viator Catholic	265	0	190	15	0	0	9	4
Storey County K-8	0	0	145	0	0	0	0	0
Virginia City Middle	0	0	0	6	12	0	4	12
Whittell High	0	0	21	3	0	0	0	2
Zephyr Cove Elementary	38	0	76	12	35	0	0	5
N/A	0	0	0	1	0	0	0	4
Totals	2437	240	1481	199	588	0	228	110

Study Purpose

This study was designed to evaluate changes in attitude, behavior, and knowledge of participants in the 2016-2017 Sun Smart Schools program before and after curriculum and policy interventions in their schools.

Methods

Measures

Completed surveys were either scanned in electronically into Excel, manually entered into Excel, or downloaded as Excel files from SurveyMonkey and combined by survey group. Surveys were analyzed at both pre- and post-intervention to understand

how the population responded to the Sun Smart Schools interventions in terms of knowledge, attitude, and behavior.

Convenience sampling was used to gain as many responses as possible to the surveys. Teachers were asked to distribute paper surveys in their classes and links were provided to online versions of the surveys as well. Parents of students in these schools and educators and administrators within the schools were also asked to respond to the surveys at both pre- and post-intervention time points.

Pre-surveys were not formally closed as students were exposed to the Sun Smart Schools curriculum throughout the year depending on specific course scheduling or guest speaker presentations. Post-surveys were closed on June 26, 2017.

Inclusion/Exclusion Criteria

All students, parents, educators and administrative staff at schools that adopted any curriculum or intervention from the Sun Smart Schools program were eligible to participate in the pre- and post-intervention surveys. Students who were in grades 3 and below were excluded from participating in the surveys even if their school adopted curriculum due to the reading and comprehension level required for the survey.

Data Analysis

Descriptive statistics were used to report demographic characteristics for the study population. Chi-square testing was performed for select demographic variables and t-testing was performed for knowledge changes to determine if the distribution of values or difference of means differed between those who completed the pre-intervention survey and those who completed the post-intervention survey. Crude and multiple logistic regression analyses were conducted for various exposure variables and demographic variables, simultaneously adjusting for all other factors.

For all analysis, a p-value of 0.05 was used as the cutoff for statistical significance. All analysis was conducted using SAS 9.4 software.

Ethical Considerations

This study was designed to understand changes in knowledge, attitudes, and behaviors among participants of the Sun Smart Schools program to evaluate the effectiveness of the interventions and provide feedback for program improvement. Personal identifiers were not collected in the surveys and responses remained anonymous. Therefore, formal review by an institutional review board or ethics committee is not applicable for this study.

Results

Elementary & Middle School Participants

Demographics

A total of 2,437 4th through 8th graders participated in the pre-intervention survey at a total of 16 schools across Nevada. At post-survey, 588 students at 11 schools completed the post-intervention survey. In both surveys, Whites were the most predominant race followed by Hispanic/Latino. Full breakdowns of the population are presented in Table 3.

Using chi-square testing on demographic characteristics, there were statistically significant differences in respondents from pre- to post- survey in terms of grade (X^2= 34.0, df=4; p<0.0001) and race (X^2= 47.9, df=5; p<0.0001), suggesting the populations who responded to the survey at pre- and post- were different racial populations. Chi square testing for gender shows a non-statistically significant p-value of 0.0782 (X^2=3.1, df=1), suggesting the populations at pre- and post- survey did not differ significantly in terms of gender.

Table 3. Characteristics of elementary and middle school student respondents to the 2016-2017 Sun Smart Schools Pre- and Post-Intervention surveys

	Pre-survey (n=2,437)		Post-survey (n= 588)	
Characteristic	n	*%*	n	*%*
Grade				
4	555	22.83	157	26.70
5	556	22.87	141	23.98
6	324	13.33	66	11.22
7	352	14.48	123	20.92
8	644	26.49	101	17.18
Missing	*6*			
Gender				
Male	1,256	52.01	282	47.96
Female	1,159	47.99	306	52.04
Missing	*22*			
Race				
White	1,138	47.10	221	37.59
Black	108	4.47	39	6.63
Hispanic/Latino	643	26.61	176	29.93
Native American	99	4.10	17	2.89
Asian	175	7.24	85	14.46
Other	253	10.47	50	8.50
Missing	*21*			
School				
CC Menley Elementary	138	5.66	42	7.14

Table 3. Characteristics of elementary and middle school student respondents to the 2016-2017 Sun Smart Schools Pre- and Post-Intervention surveys

	Pre-survey (n=2,437)		Post-survey (n= 588)	
Characteristic	n	%	n	%
Carson Valley Middle	423	17.36	3	0.51
Gallagher Elementary	49	2.01	22	3.74
Gardnerville Elementary	73	3.00	6	1.02
Hillside School K-8	10	0.41	-	-
Jacks Valley	125	5.13	1	0.17
Lenz Elementary	77	3.16	2	0.34
Minden Elementary	50	2.05	-	-
Pau-Wa-Lu Middle	56	2.30	36	6.12
Pine Middle	533	21.87	226	38.44
Pinion Hills Elementary	133	5.46	-	-
Rogers Elementary	253	10.38	203	34.52
Scarscelli Elementary	86	3.53	-	-
Sparks Middle	128	5.25	-	-
St. Viator Parish School	265	10.87	-	-
Virginia City Middle School	-	-	12	2.04
Zephyr Cove Elementary	38	1.56	35	5.95

Knowledge

Students in elementary and middle school were asked five knowledge based questions to determine how effective the program was in increasing their sun safety knowledge from baseline to post-intervention. Results for each question at pre- and post- survey are shown below in Table 4. The question with the least number of correct scores at both pre- and post- survey asked for the lowest recommended SPF.

Table 4. Responses to knowledge questions and changes for Elementary and Middle School participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=2,437)			Post-survey (n= 588)		
Question (correct answer)	Correct (%)	Incorrect (%)	Don't know (%)	Correct (%)	Incorrect (%)	Don't know (%)
Do you think spending a lot of time in the sun as a child can cause wrinkled or freckled skin when you grow up? (Yes)	39.67	14.81	45.54	45.92	16.33	37.76
Can spending a lot of time in the sun cause skin cancer when you grow up? (Yes)	58.47	6.85	34.68	65.48	5.78	28.74
Can you get a sunburn on a cloudy day? (Yes)	39.12	36.82	24.06	44.22	30.27	25.51
What is the lowest SPF number you should wear? (30 SPF)	19.03	39.35	41.62	25.34	30.44	44.22
What time of day are the sun's rays most dangerous? (10AM-4PM)	51.43	25.03	23.54	51.36	31.12	17.52

Overall knowledge scores were calculated by adding up the number of correct responses to the five knowledge-based questions for each respondent. A maximum score of 5 was possible. At pre-survey, the overall average score for elementary and middle school students was 2.06 and the median score was 2.0. At post-survey, the overall average score for students was 2.32 with a median of 2.0. T-testing to evaluate the difference of means shows a statistically significant 0.26-point increase in means (t= -4.10; p<0.0001) from pre- to post survey, meaning for elementary and middle school participants, there was a statistically significant increase in knowledge scores after the intervention. Table 5 provides the breakdown of correct responses by grade and gender at pre- and post- survey. Results show that females had higher knowledge scores than males at both baseline and post-intervention.

Table 5. Overall knowledge score for Elementary and Middle School participants of the 2016-2017 Sun Smart Schools program

Pre-survey (n=2,437)							
Knowledge Score	**4th grade (%)**	**5th grade (%)**	**6th grade (%)**	**7th grade (%)**	**8th grade (%)**	**Male (%)**	**Female (%)**
0	20.79	17.78	14.20	15.45	7.62	14.57	15.17
1	29.21	23.33	22.40	21.28	15.71	24.86	19.58
2	23.60	23.33	21.14	24.20	25.71	23.54	23.99
3	17.98	17.41	22.40	22.45	27.46	21.32	21.87
4	6.93	14.26	16.40	13.12	19.05	12.51	15.78
5	1.50	3.89	3.47	3.50	4.44	3.21	3.62
Mean Score	1.64	1.97	2.14	2.06	2.47	2.00	2.13
Median Score	1.00	2.00	2.00	2.00	3.00	2.00	2.00
Post-survey (n=588)							
Knowledge Score	**4th grade (%)**	**5th grade (%)**	**6th grade (%)**	**7th grade (%)**	**8th grade (%)**	**Male (%)**	**Female (%)**
0	16.56	10.64	21.21	7.32	3.96	14.18	9.15
1	24.20	19.15	19.70	17.89	9.90	19.50	17.97
2	27.39	24.82	16.67	22.76	23.76	28.37	19.93
3	24.20	21.99	21.21	21.14	33.66	21.63	26.80
4	3.82	15.60	15.15	22.76	18.81	12.06	16.67
5	3.82	7.80	6.06	8.13	9.90	4.26	9.48
Mean Score	1.86	2.36	2.08	2.59	2.83	2.11	2.52
Median Score	2.00	2.00	2.00	3.00	3.00	2.00	3.00

T-tests were conducted for each grade level and for both genders to determine if there was a statistically significant increase in knowledge from pre- to post-survey for each group. Testing showed significant increases in knowledge from pre- to post-survey among 5th graders (t= -2.92, p= 0.0036), 7th graders (t= -3.63, p= 0.0003), 8th graders (t= -2.66, p= 0.0079), and females (t= -4.36, p< 0.0001).

Attitude

Elementary and middle school participants were asked two questions about sun-safety attitude. The first question asked them to report how important it is to protect themselves from the sun. Results are provided in Figure 1, showing a slightly increased importance overall at post-survey, with an additional 3.8% of respondents reporting it is either important or very important.

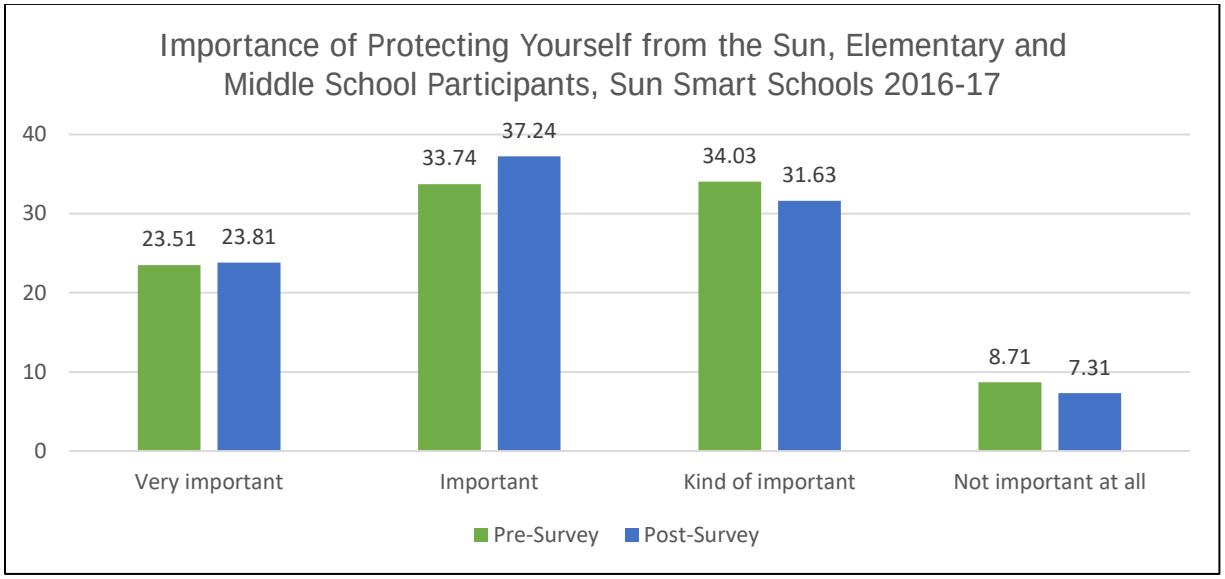

Figure 1

Logistic regression analyses were conducted on this question at both pre- and post- survey to determine the odds of reporting it is very important or important to protect yourself from the sun based on different demographics. Table 6 shows the crude and adjusted logistic regression analyses, with the adjusted analysis representing the odds of reporting it is important while being controlled for all other factors simultaneously.

Table 6. Crude and adjusted logistic regression analysis of characteristics of the elementary and middle school participants in the 2016-2017 Sun Smart Schools survey for importance of protecting themselves from the sun

	Pre-survey (n=2,437)					
Characteristic	Crude Odds Ratio	95% C.I.†	p-value‡	Adjusted Odds Ratio	95% C.I.†	p-value‡
Gender			**<0.0001**			**<0.0001**
Female	1.73	(1.47, 2.04)		1.73	(1.47, 2.05)	
Male (Reference)	1.00	---		1.00	---	
Grade			**<0.0001**			**<0.0001**
4th	1.71	(1.35, 2.12)		1.62	(1.27, 2.07)	
5th	1.80	(1.43, 2.27)		1.79	(1.40, 2.29)	
6th	1.17	(0.89, 1.53)		1.16	(0.88, 1.52)	
7th	0.85	(0.65, 1.10)		0.86	(0.66, 1.13)	
8th (Reference)	1.00	---		1.00	---	
Race			**<0.001**			**0.0002**
White	1.83	(1.23, 2.73)		1.71	(1.13, 2.60)	

Table 6. Crude and adjusted logistic regression analysis of characteristics of the elementary and middle school participants in the 2016-2017 Sun Smart Schools survey for importance of protecting themselves from the sun

Hispanic / Latino	1.10	(1.73, 1.66)		1.13	(0.73, 1.74)	
Asian	1.68	(1.03, 2.72)		1.51	(0.91, 2.50)	
Native American	1.19	(0.69, 2.05)		0.97	(0.54, 1.72)	
Other race	1.58	(1.00, 2.48)		1.28	(0.80, 2.06)	
Black (Reference)	1.00	---		1.00	---	

* Adjusted simultaneously for all other factors; † C.I. Confidence interval; ‡ Likelihood Ratio Chi-square Test

Post-survey (n=588)

Characteristic	Crude Odds Ratio	95% C.I.†	p-value‡	Adjusted Odds Ratio	95% C.I.†	p-value‡
Gender			0.0864			0.0566
Female	1.34	(0.96, 1.87)		1.41	(0.99, 2.01)	
Male (Reference)	1.00	---		1.00	---	
Grade			0.1135			**0.0303**
4th	1.50	(0.89, 2.52)		1.89	(1.09, 3.28)	
5th	1.44	(0.85, 2.44)		1.68	(0.96, 2.95)	
6th	0.89	(0.47, 1.67)		0.92	(0.49, 1.73)	
7th	0.89	(0.52, 1.51)		0.94	(0.54, 1.63)	
8th (Reference)	1.00	---		1.00	---	
Race			**0.0287**			**0.0045**
White	2.37	(1.18, 4.74)		2.90	(1.44, 5.84)	
Hispanic / Latino	1.45	(0.72, 2.92)		2.01	(0.98, 4.14)	
Asian	1.30	(0.60, 2.80)		1.26	(0.59, 2.70)	
Native American	2.53	(0.74, 8.61)		2.92	(0.86, 9.90)	
Other race	1.14	(0.49, 2.65)		1.16	(0.50, 2.72)	
Black (Reference)	1.00	---		1.00	---	

* Adjusted simultaneously for all other factors; † C.I. Confidence interval; ‡ Likelihood Ratio Chi-square Test

For elementary and middle school students at both pre- and post- survey, females had greater odds of reporting it is important to protect yourself from the sun when compared to males even when the analysis was controlled for all other demographic characteristics. Adjusted odds ratios did decrease from pre- to post-survey, from 1.73 to 1.41, with the post-survey result borderline non-significant (p=0.0566). When looking at the cause of this change, females showed no change in importance from pre-to post-survey, however males showed an increase in importance from pre- to post-survey, bringing the odds closer to 1.0. In both pre- and post-surveys, race and grade were statistically significant indicators of differing attitudes. In the pre-survey, 5th graders were the most concerned with this topic, showing 1.79 times the odds of reporting it is important to protect yourself from the sun when compared with 8th graders. At post survey, 4th graders had the highest odds, at 1.89 times the odds when compared to 8th graders. At both time points, there is a general decrease in importance as grade increases.

Among elementary and middle school students, Whites expressed the most importance with protecting themselves from the sun at both pre- and post- survey. At pre- survey, Whites had 1.71 times the odds of reporting it is important when compared to Blacks, and 2.9 times the odds at post-survey.

Respondents were also asked if they believe they and their friends look better with a suntan. Figure 2 displays the pre- and post- survey responses, showing very little change in attitude over the school year.

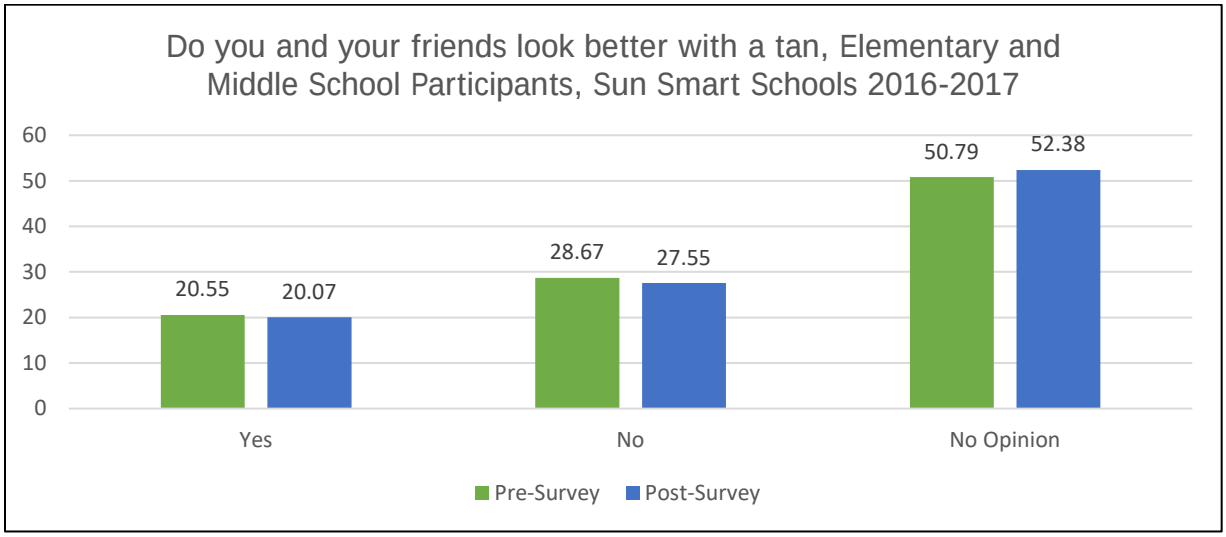

Figure 2

Table 7 shows the crude and adjusted logistic regression analyses for this question, with the adjusted analysis representing the odds of reporting you look better with a tan while controlling for all other demographic factors simultaneously.

Table 7. Crude and adjusted logistic regression analysis of characteristics of the elementary and middle school participants in the 2016-2017 Sun Smart Schools survey for attitude on whether they look better with a tan

Pre-survey

Characteristic	Crude Odds Ratio	95% C.I.†	p-value‡	Adjusted Odds Ratio	95% C.I.†	p-value‡
Gender			0.0937			0.1076
Female	0.84	(0.69, 1.03)		0.85	(0.69, 1.04)	
Male (Reference)	1.00	---		1.00	---	
Grade			**0.0146**			**0.0013**
4th	0.80	(0.60, 1.05)		0.67	(0.50, 0.91)	
5th	0.66	(0.51, 0.90)		0.56	(0.42, 0.76)	
6th	0.59	(0.42, 0.84)		0.60	(0.42, 0.86)	
7th	0.85	(0.62, 1.17)		0.81	(0.59, 1.13)	
8th (Reference)	1.00	---		1.00	---	
Race			**<0.001**			**<0.0001**
White	1.61	(0.97, 2.67)		1.63	(0.98, 2.71)	
Hispanic / Latino	0.54	(0.31, 0.93)		0.51	(0.29, 0.89)	
Asian	0.53	(0.27, 1.05)		0.56	(0.28, 1.11)	
Native American	1.74	(0.90, 3.35)		1.90	(0.98, 3.66)	
Other race	1.10	(0.62, 1.96)		1.19	(0.67, 2.14)	
Black (Reference)	1.00	---		1.00	---	

* Adjusted simultaneously for all other factors; † C.I. Confidence interval; ‡ Likelihood Ratio Chi-square Test

Post-survey

Characteristic	Crude Odds Ratio	95% C.I.†	p-value‡	Adjusted Odds Ratio	95% C.I.†	p-value‡
Gender			**0.0063**			**0.0052**
Female	0.56	(0.37, 0.85)		0.54	(0.35, 0.83)	
Male (Reference)	1.00	---		1.00	---	

Table 7. Crude and adjusted logistic regression analysis of characteristics of the elementary and middle school participants in the 2016-2017 Sun Smart Schools survey for attitude on whether they look better with a tan

Grade			**0.0039**			**0.0017**
4th	0.35	(0.18, 0.65)		0.27	(0.14, 0.54)	
5th	0.44	(0.23, 0.82)		0.34	(0.17, 0.67)	
6th	0.58	(0.28, 1.23)		0.48	(0.23, 1.00)	
7th	0.87	(0.48, 1.56)		0.68	(0.36, 1.27)	
8th (Reference)	1.00	---		1.00	---	
Race			**0.0007**			**0.0004**
White	2.53	(0.94, 6.83)		2.26	(0.80, 6.35)	
Hispanic / Latino	1.23	(0.44, 3.46)		0.91	(0.30, 2.74)	
Asian	0.52	(0.15, 1.83)		0.60	(0.17, 2.18)	
Native American	3.71	(0.94, 14.71)		3.63	(0.89, 14.73)	
Other race	2.64	(0.85, 8.20)		3.11	(0.95, 10.24)	
Black (Reference)	1.00	---		1.00	---	

* Adjusted simultaneously for all other factors; † C.I. Confidence interval; ‡ Likelihood Ratio Chi-square Test

Females had reduced odds of reporting they look better with a tan when compared to males at both pre- and post- surveys. There was a statistically significant adjusted odds ratio at post-survey, showing females had 50% reduced odds of reporting they look better with a tan when compared to males, even when controlling for all other demographic characteristics. At both pre- and post- survey, odds of reporting they look better with a tan increase as grade increases.

Behavior

The survey asked several behavioral questions. The first asked how often the students put on sunscreen when going outside for more than one hour. Responses are displayed in figures 3-5 below for overall results, males, and females, respectively.

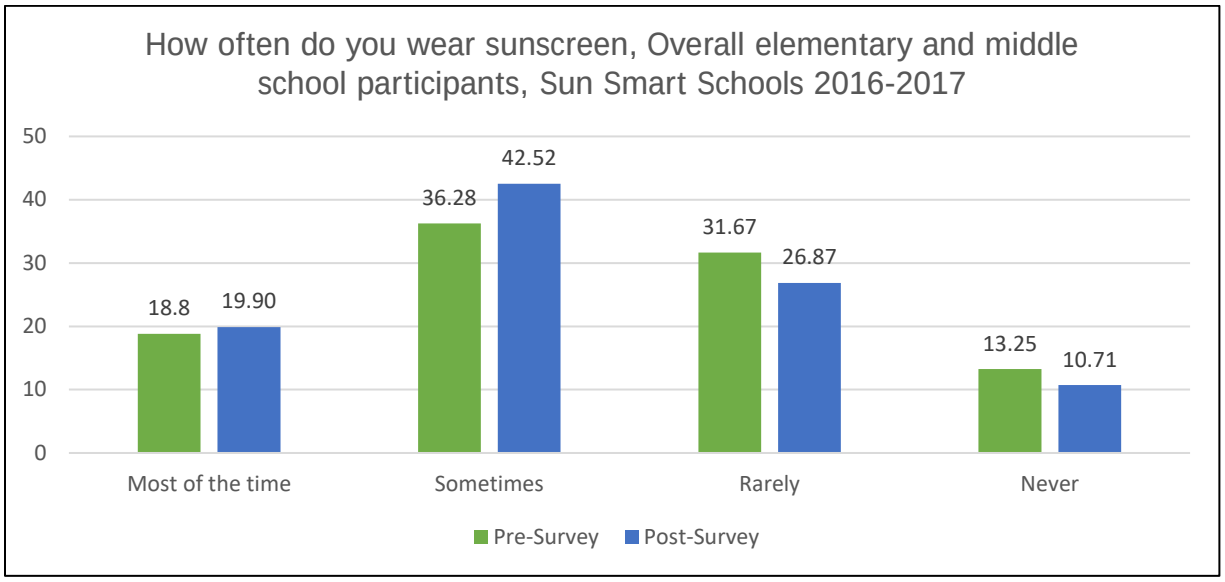

Figure 3

Overall, there was an increase from pre- to post-survey in the percentage of elementary and middle school students who reported wearing sunscreen most of the time or sometimes when going outside for more than an hour, with 62.4% of the population responding this way at post-survey, up from 55.08% at pre-survey. This same trend was seen for male students as well, with a 4.5% increase in the number of students who reported wearing sunscreen most of the time and a 7.1% increase in students who reported wearing it sometimes, for a total of 59.9% of the male population responding this way at post-survey.

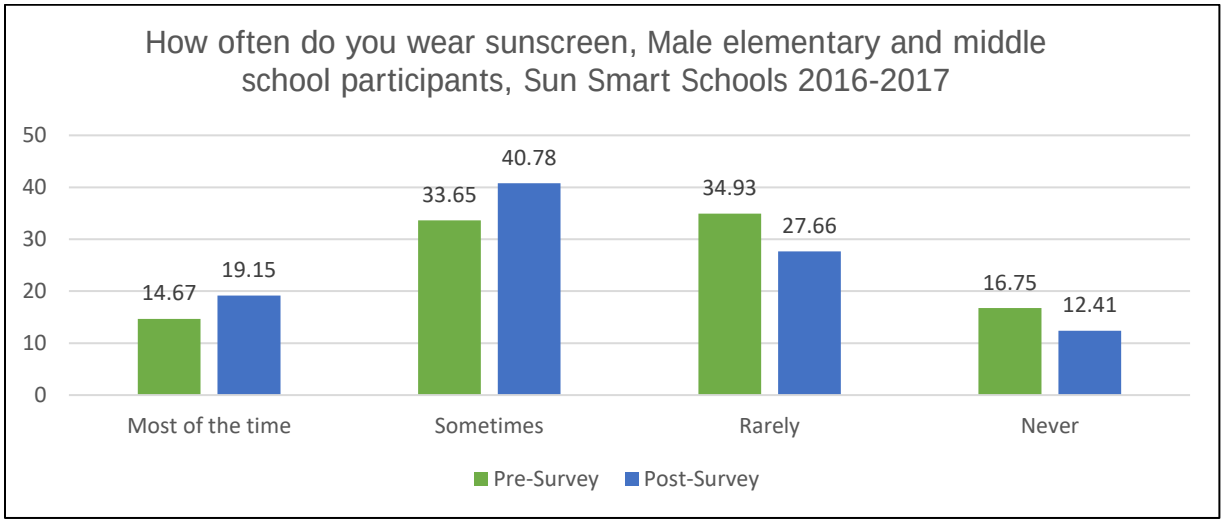

Figure 4

Female participants showed a 3% decrease in wearing sunscreen most of the time at post-survey, however there was a 5% increase in those who reported wearing sunscreen sometimes, for a total of 64.7% of females reporting positive sunscreen behavior at post-survey.

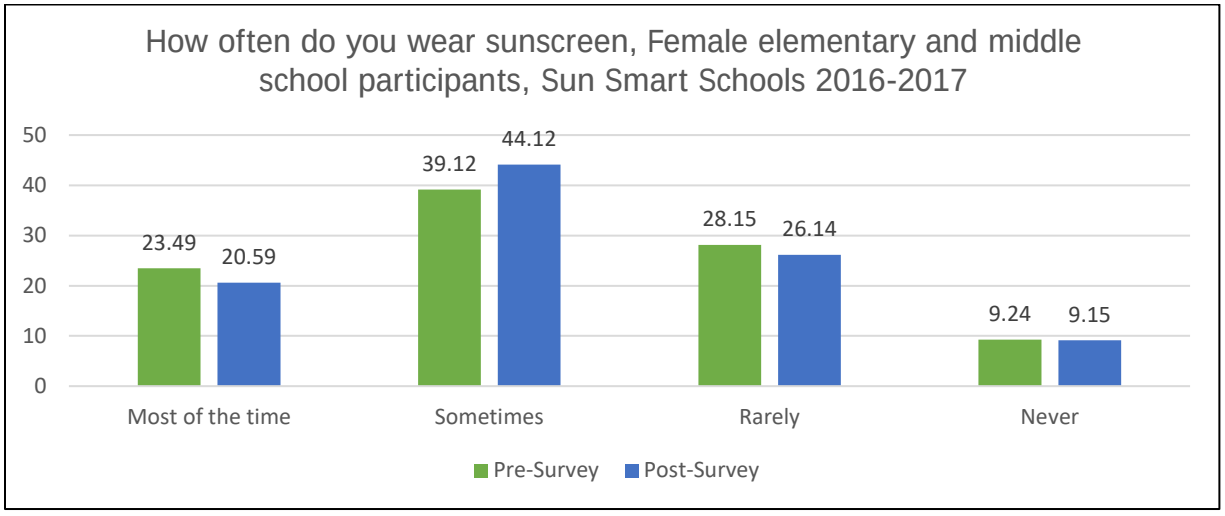

Figure 5

Among the different race categories, Whites were most likely to respond that they wore sunscreen most of the time or some of the time at both pre- and post-surveys (61.83% at pre-survey, 72.85% at post-survey), as shown in Figure 6. Decreases in typical sunscreen use were seen among both Black and Asian respondents from pre- to post-survey.

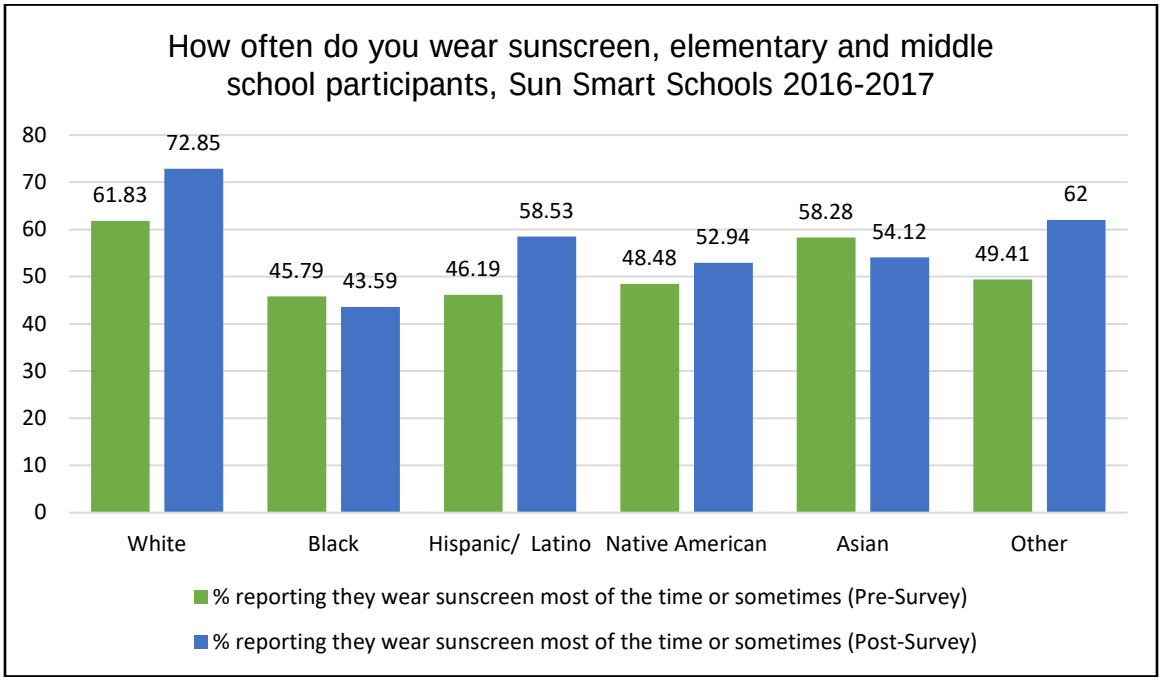

Figure 6

The surveys also captured commonly used protective behaviors when outside in the middle of the day and reasons students did not protect themselves from the sun, as displayed in Table 8. The most commonly reported methods of sun protection at both pre- and post- surveys were wearing sunscreen and seeking shade (50.2% and 45.8% at pre-survey, and 58.8% and 52.7% at post-survey, respectively).

When students were asked for their reasons for not protecting themselves from the sun, responses at both pre- and post- survey showed the most common reasons to be they just don't think about it and they don't like wearing hats or long-sleeve shirts when it's hot outside. Interestingly, in this study only 3% of pre-survey and 5% of post-survey participants noted social pressures against protecting themselves (e.g. my friends will think I'm weird) as a reason for not protecting themselves.

Table 8. Sun protection behaviors of Elementary and Middle School participants of the Sun Smart Schools program 2016-2017

Use of sun protective behaviors			Reasons for not using sun protective behaviors		
	Pre survey (%)	Post survey (%)		Pre survey (%)	Post survey (%)
Wear a hat	44.11	49.32	Sunscreen is too messy	18.26	18.88
Wear sunglasses	40.91	47.11	Don't like wearing hats or long-sleeve shirts when it's hot	39.93	38.95
Wear a long sleeve shirt	16.91	18.71	Friends will think I'm weird	3.82	5.10
Seek shade	45.84	52.72	Hard to find shade	17.4	18.71
Wear sunscreen	50.23	58.84	Just don't think about it	38.28	37.24

Elementary and middle school children could provide self-written feedback on the reasons they did not protect themselves from the sun. Several themes emerged from the responses. Of the 445 comments, 102 (23%) surrounded barriers to protection, including lack of time, forgetting to apply sunscreen or clothing, or being too lazy to bother protecting themselves.

"I just forget to put on sunscreen and I don't think it is really necessary because we are teens and we are sometimes in a rush to our friend's house or something." ***8th grader, Pre-survey***

"I know I can get cancer in the future but I just don't like spending time putting on sunscreen and I don't like the feeling on sunscreen." ***5th grader, Post-survey***

A second emergent theme surrounded disliking the smell or feel of sunscreen, or with feeling uncomfortable or hot in protective clothing like hats and long sleeve shirts, with 69 comments (16%) expressing these issues.

"I don't like wearing long sleeves outside and I don't like sunscreen." ***8th grader, Pre-survey***

"I hate sunscreen even though I badly need it." ***8th grader, Pre-survey***

A third emergent theme surrounded the feeling of invincibility, with 54 comments (12%) talking about not needing protection because they are dark skinned or do not get burned.

"I don't burn when I'm out in the hot sun, it might be cause I'm just naturally really tan and don't burn." *6th grader, Pre-survey*

"I don't need to because if you have dark skin you don't need anything unless you want to." *4th grader, Post-survey*

Similar to the idea of feeling invincible from the sun, 37 participants (8%) noted just not caring or not wanting to protect themselves from the sun.

"I don't really care about my skin." *8th grader, Pre-survey*

"It just doesn't really apply to me. And it isn't that important to me." *4th grader, Post-survey*

Several other notable themes were identified. Twenty-four students said they don't go outside often so sun protection doesn't apply to them. Twelve students said they want to be tan so therefore did not want to practice sun safety. Nine students said they were allergic or sensitive to sunscreen. Notably, six students expressed concerns with the chemicals in sunscreen and blocking vitamin absorption; a selection of these comments are below:

"It is a well-known fact that most sun screen can cause skin cancer just like the sun can." *6th grader, Pre-survey*

"I don't think I need to protect myself because sun gives you a lot of vitamin in your body." *5th grader, Post-survey*

There were three questions added to the post-survey. First, elementary and middle school students were also asked if they would do more to protect themselves from the sun over the summer after learning about the importance of sun safety during the school year. Responses were very positive, with 75.17% of students reporting they would do more over the summer to protect themselves. Secondly, students were asked how often they used the sunscreen dispensers that NCC had provided to their schools. Figure 7 shows the results of their usage, with only 4.2% reporting that they used it every time they went outside.

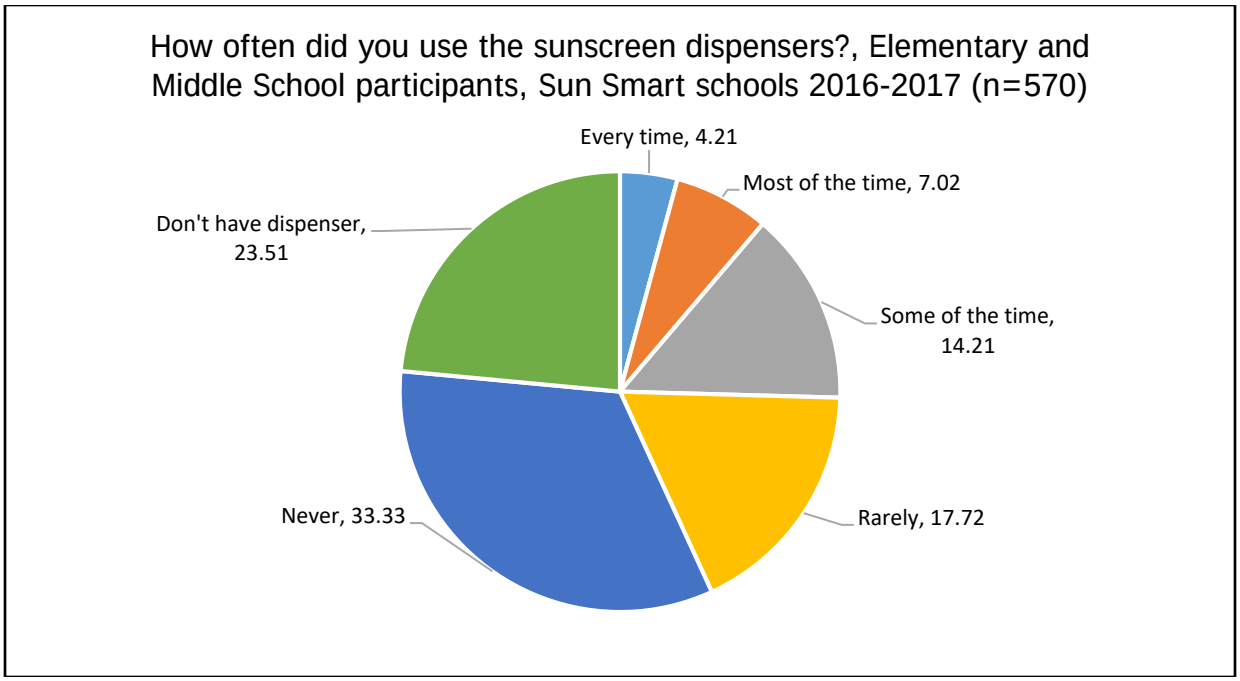

Figure 7

Lastly, at post-survey students were asked if they bring and use their own sunscreen. Only 36 students reported doing this, for 6.12% of the population.

High School Participants

Demographics

A total of 240 high school students responded to the pre-intervention survey, with participants almost exclusively attending Douglas High School (99.58% of respondents). Students at Douglas High School were exposed to sun safety curriculum during their one-semester health course taken during freshman year. Students in each semester's course took the survey before exposure to the curriculum, however no high school students took the post-survey. All data presented below is for pre-intervention knowledge, behaviors, and attitudes.

Table 9. Characteristics of high school student respondents to the 2016-2017 Sun Smart Schools Pre- and Post-Intervention surveys

	Pre-survey (n=240)	
Characteristic	n	%
Grade		
9	226	94.17
10	3	1.25
11	3	1.25
12	10	3.33
Gender		
Male	117	48.72

Table 9. Characteristics of high school student respondents to the 2016-2017 Sun Smart Schools Pre- and Post-Intervention surveys

	Pre-survey (n=240)	
Characteristic	n	%
Female	123	51.28
Race		
White	167	69.58
Black	7	2.92
Hispanic/Latino	41	17.08
Native American	9	3.75
Asian	8	3.33
Other	8	3.33
School		
Aspire Academy High	1	0.42
Douglas High	239	99.58

As displayed in Table 9, most participants, 94.2%, were in the 9th grade and gender was fairly equally distributed. Almost 70% of high school participants were White, followed by 17.1% Hispanic/Latino.

Unfortunately, 78 students at Douglas High School who should have received the "High School Pre-Survey" were given a link to take the online "Educator Post-Survey." These students answered all of the same pre-survey questions except for noting any extracurricular activities. Among the 162 students who did respond to this question, 51.85% reported participating in after-school activities. The most common after-school activities where students were exposed to the sun were football (17 students), track (13 students), soccer (9 students), and cross country (6 students).

Knowledge

Students in high school were asked seven knowledge-based questions. As no post-survey responses are available for this group, only baseline responses are displayed below in Table 10. The most challenging questions for high school students were whether or not a base tan helps protect skin from sun damage (32% answered correctly and 52% said they did not know) and what is the lowest recommended SPF to use (only 32% answered correctly).

Table 10. Responses to knowledge questions and changes for High School participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=240)		
Question (correct response)	**Correct (%)**	**Incorrect (%)**	**Don't know (%)**
Can spending a lot of time in the sun in childhood lead to skin cancer when you're older? (Yes)	81.62	4.17	14.17
Does a base tan help protect your skin from sun damage (No)	32.08	16.25	51.67
Can you get a sunburn on a cloudy day? (Yes)	74.17	8.33	17.50
Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin? (Yes)	83.75	2.08	14.17

Table 10. Responses to knowledge questions and changes for High School participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=240)		
Question (correct response)	**Correct (%)**	**Incorrect (%)**	**Don't know (%)**
Do you think sun exposure or tanning in a tanning bed can cause skin cancer? (Yes)	86.25	1.25	12.50
What is the lowest SPF number you should wear? (30 SPF)	32.08	46.25	21.67
What time of day are the sun's rays most dangerous? (10AM-4PM)	56.25	29.17	14.58

Overall knowledge scores were calculated by adding up the number of correct responses to the seven knowledge-based questions for each respondent. A maximum score of 7 was possible. Overall at pre-survey, the average score for high school students was 4.46 and the median score was 5.0. Table 11 provides the breakdown of correct responses for overall scores and by gender at pre-survey. Results show that females had a slightly higher baseline knowledge when compared with males.

Table 11. Knowledge scores for High School participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=240)		
Knowledge score (maximum of 7)	**Overall (%)**	**Male (%)**	**Female (%)**
0	4.17	5.98	2.44
1	4.58	5.13	4.07
2	4.58	5.98	3.25
3	9.17	11.11	7.32
4	17.50	16.24	18.70
5	30.42	31.62	29.27
6	24.17	17.09	30.89
7	5.42	6.84	4.07
Mean Score	4.46	4.23	4.67
Median Score	5.00	5.00	5.00

Attitude

High school participants were asked three questions about sun-safety attitude. The first question asked them to report how important it is to protect themselves from the sun and results are displayed in Figure 8. Responses at pre-survey showed 41.25% of students felt it was very important or important, but the majority, 42.92%, felt it was only kind of important.

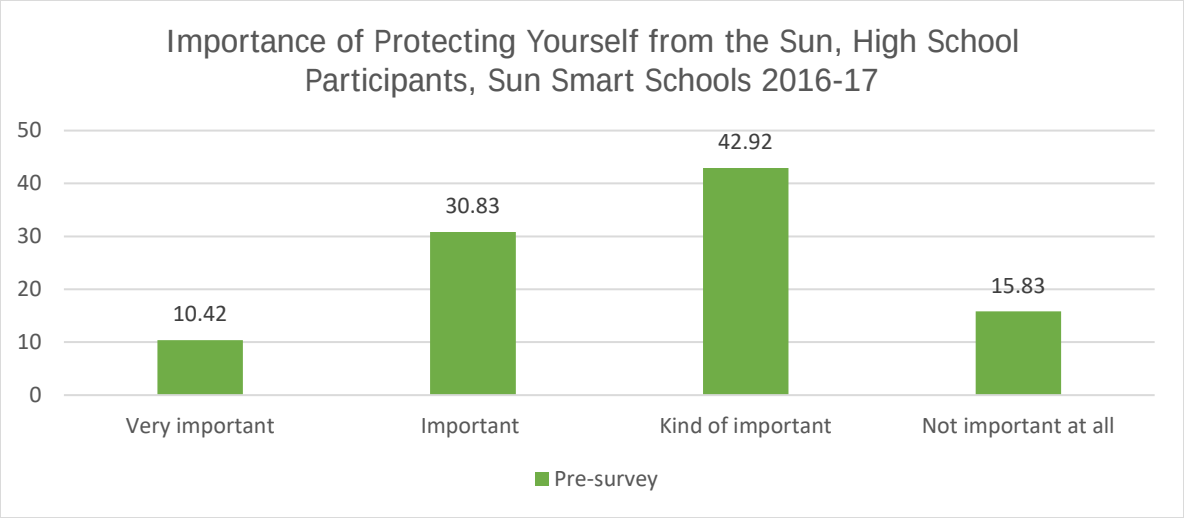

Figure 8

Logistic regression analyses were conducted on this question to determine the odds of reporting it is very important or important, controlling for both gender and race (data not shown). While gender had no effect on responses, race appeared to influence the importance of protecting oneself. However, results must be interpreted cautiously as the sample size for most race categories was extremely small.

Respondents were also asked if they believe they and their friends look better with a suntan. Responses showed 43.59% felt they did look better with a tan, 13.68% felt they did not look better with a tan, and 42.74% had no opinion. However, 50.42% of respondents said it was very important to avoid the use of tanning beds, as shown in Figure 9.

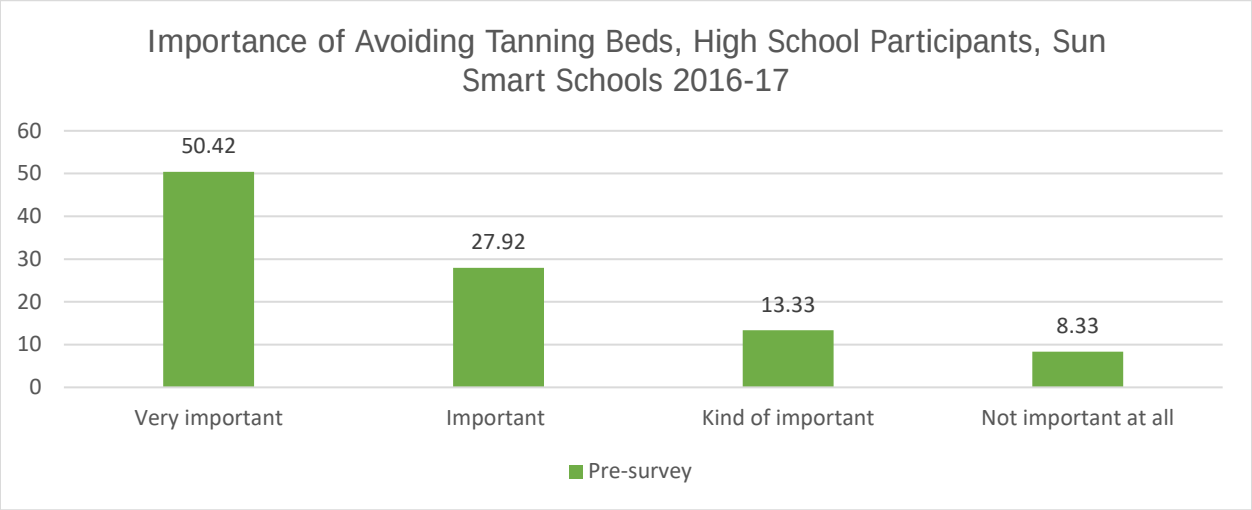

Figure 9

Crude and adjusted logistic regression analyses were conducted to understand how gender and race influence tanning attitudes, shown in Table 12. Results of the

adjusted analysis showed that females had a statistically significant 89% increased odds of reporting they and their friends look better with a tan when compared with males (p=0.0222). Due to a very small sample size for some of the race categories, analysis suggests Whites had higher odds of thinking they look better with a tan, however results were not statistically significant and conclusions should be drawn with caution.

Table 12. Crude and adjusted logistic regression analysis of characteristics of high school participants in the 2016-2017 Sun Smart Schools survey for attitude on whether they look better with a tan

	Pre-survey					
Characteristic	Crude Odds Ratio	95% C.I.†	p-value‡	Adjusted Odds Ratio	95% C.I.†	p-value‡
Gender			**0.0261**			**0.0222**
Female	1.81	(1.07, 3.04)		1.89	(1.10, 3.25)	
Male (Reference)	1.00	---		1.00	---	
Race			0.1056			0.1070
White	6.07	(0.69, 53.49)		6.51	(0.63, 67.22)	
Hispanic / Latino	2.20	(0.23, 21.20)		2.27	(0.20, 25.37)	
Asian	3.60	(0.27, 48.48)		4.18	(0.26, 67.25)	
Native American	4.80	(0.38, 60.60)		5.36	(0.36, 79.19)	
Other race	3.60	(0.27, 48.48)		3.85	(0.63, 67.22)	
Black (Reference)	1.00	---		1.00	---	

* Adjusted simultaneously for all other factors; † C.I. Confidence interval; ‡ Likelihood Ratio Chi-square Test

Behavior

High school students were asked several behavior related questions. As shown in Figure 10, females had higher rates of wearing sunscreen most of the time and some of the time when compared to males. Almost a quarter of male students responded that they never use sunscreen.

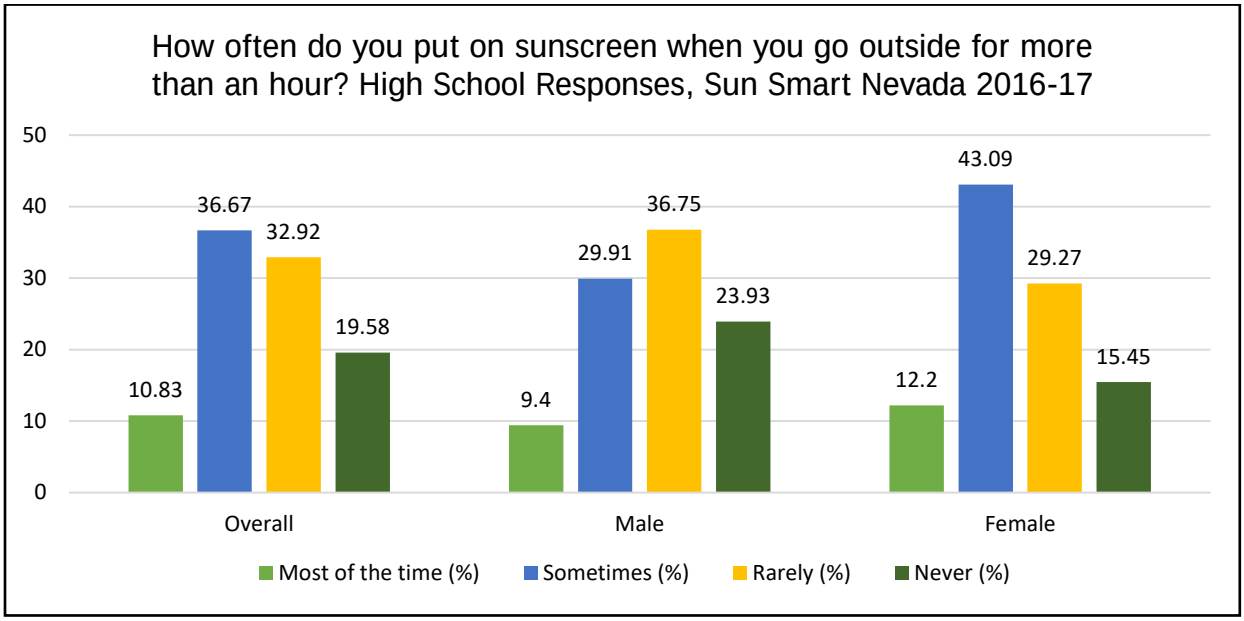

Figure 10

High school students were also asked how often they had used a tanning bed in the last 5 years. Results showed that 93.2% of males and 95.1% of females in the high school population had never used a tanning bed. Males had the highest percentage of reported usage, with 5.13% reporting they had tanned more than 50 times in the last 5 years, whereas only 1.63% of females reporting doing so. Females did have higher rates of low-level use of tanning beds, with 3.25% reporting they had tanned between 1 and 10 times in the last 5 years, while only 0.85% of males reported this.

Lastly, high school students were asked about what sun protective behaviors they use and their reasons for not protecting themselves from the sun. Results are displayed in Table 13, and show the most common protective behavior for high school students to be shade seeking (52.1%) and wearing sunglasses (48.8%). Over 60% of students responded that they just don't think about protecting themselves from the sun, and 36.3% felt it was inconvenient to put on sunscreen.

Table 13. Sun protection behaviors of High School participants of the Sun Smart Schools program 2016-2017

Use of sun protective behaviors			Reasons for not using sun protective behaviors		
	Pre survey (n)	Pre survey (%)		Pre survey (n)	Pre survey (%)
Wear a hat	95	39.58	It is inconvenient to put on sunscreen	87	36.25
Wear sunglasses	117	48.75	Don't like how I look in hats or long-sleeve shirts when it's hot	33	13.75
Wear a long sleeve shirt	48	20.00	Friends will think I'm weird	7	2.92
Seek shade	125	52.08	Hard to find shade	33	13.75
Wear sunscreen	102	42.50	Just don't think about it	146	60.83

Students were also able to write in responses, providing several emergent themes in regard to sun safety behaviors. A total of 52 students provided written responses about sun protection, and 33% of responses dealt with students feeling invincible from the sun and not caring about protecting themselves. 23% of responses expressed that the student just forgot to protect themselves or were too lazy to bother. Another 23% talked about not liking sunscreen or wearing protective clothing in the summer. 12% of respondents chose not to protect themselves because they want a tan, whereas 6% said they rarely go outside so they don't think about it.

"Ever since I have been little I have never gotten any sun burns like I have never had one and I've had checkups on my skin and there is nothing wrong the only thing that does happen is I just get tanner." ***9th grader, Pre-survey***

"I honestly don't care. I've been swimming for three years in the sun, and I have never gotten sunburned in that time." ***9th grader, Pre-survey***

"I just don't care. I'm a rancher." ***9th grader, Pre-survey***

Because students in the second semester health class at Douglas High School were given the incorrect survey, it provided space for them to comment on the curriculum and sun screen dispensers. While only sixteen students commented, responses were mostly negative and reported that the dispensers were often broken or empty (6 comments), and kids use them more to throw the sunscreen at each other instead of applying it to themselves.

"I probably would use the dispensers but ALL of them are broken or run-out! None of them work and never have."

"Your machines are always empty. Kids will use them all up to throw at each other when nobody is looking and it gets all over the walls. Please take out dispensers it is used as ammo during lunch like honestly we don't need whatever, you are interfering with our learning."

Only one student commented on the content or use of sun safety curriculum, saying, "My biology teacher has talked about it once in a unit but that has been it."

Parent Participants

Demographics

A total of 1,481 parents participated in the pre-intervention survey, and 228 parents participated in the post-intervention survey. In the pre-intervention survey, responses were largely from parents of elementary and middle school students, whereas in post-survey, results were more evenly distributed among grades, except for 21% of the population who were parents of 8th graders. The parents who participated were largely female, making up over 75% of the population in both surveys. Parents mostly identified as White or Hispanic/Latino. Full demographics are shown in Table 14.

Chi square testing was done on gender and race variables to determine if the populations at pre- and post- survey were similar (results not displayed). Testing for both race and gender showed statistically significant differences between populations (race: $p=0.0325$; gender: $p=0.0216$), suggesting the two groups who completed the pre- and post- intervention surveys were not the same.

Table 14. Characteristics of parent respondents to the 2016-2017 Sun Smart Schools Pre- and Post-Intervention surveys

	Pre-survey (n= 1,481)		Post-survey (n=228)	
Characteristic	n	%	n	%
Grade				
PK/K	163	11.01	6	2.63
1	129	8.71	9	3.95
2	157	10.6	12	5.26
3	145	9.79	12	5.26
4	236	15.94	19	8.33
5	233	15.73	17	7.46
6	104	7.02	21	9.21
7	105	7.09	26	11.40
8	119	8.04	48	21.05
9	24	1.62	16	7.02
10	26	1.76	18	7.89
11	22	1.49	12	5.26
12	18	1.22	12	5.26
Gender				
Male	369	24.97	41	17.98
Female	1109	75.03	187	82.02
Missing	3			
Race				
White	1029	70.1	184	80.70
Black	28	1.91	1	0.44
Hispanic/Latino	210	14.31	23	10.09
Native American	27	1.84	3	1.32
Asian	97	6.61	8	3.51
Other	77	5.25	9	3.95
Missing	13			
School				
Aspire Academy High	--	--	1	0.44
CC Menley Elementary	124	8.38	11	4.82
Carson Valley Middle	30	2.03	2	0.88
Douglas High	78	5.27	55	24.12
Gallagher Elementary	--	--	36	15.79
Gardnerville Elementary	51	3.45	1	0.44
Jacks Valley	32	2.16	1	0.44
Lenz Elementary	30	2.03	--	--
Minden Elementary	85	5.74	4	1.75
Pau-Wa-Lu Middle	38	2.57	29	12.72
Pine Middle	91	6.14	59	25.88
Pinion Hills Elementary	153	10.33	3	1.32
Rogers Elementary	107	7.22	5	2.19
Scarscelli Elementary	211	14.24	8	3.51
South Reno UMC Preschool	19	1.28	--	--
St. Viator Catholic School	190	12.83	9	3.95
Virginia City Middle	--	--	4	1.75
Storey County K-8	145	9.79	--	--
Whittell High	21	1.42	--	--
Zephyr Cove Elementary	76	5.13	--	--

Knowledge

Parents were asked seven knowledge-based questions to determine how effective the program was in increasing their sun safety knowledge from baseline to post-intervention. Results for each question at pre- and post- survey are shown below in Table 15. The questions with the least number of correct scores at both pre- and post- survey asked for the lowest recommended SPF and whether a base tan protects skin from sun damage. Questions about skin cancer, wrinkled skin, and sunburn risks had very high correct response rates at both pre- and post- survey.

Table 15. Responses to knowledge questions and changes for Parent participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=1,481)			Post-survey (n= 228)		
Question (correct response)	**Correct (%)**	**Incorrect (%)**	**Don't know (%)**	**Correct (%)**	**Incorrect (%)**	**Don't know (%)**
Can spending a lot of time in the sun in childhood lead to skin cancer when you're older? (Yes)	89.06	3.06	7.89	93.42	1.75	4.82
Does a base tan help protect your skin from sun damage (No)	64.02	9.76	26.22	65.79	7.02	27.19
Can you get a sunburn on a cloudy day? (Yes)	89.26	7.30	3.45	96.49	1.32	2.19
Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin? (Yes)	90.06	2.17	7.77	96.05	0.88	3.07
Do you think sun exposure or tanning in a tanning bed can cause skin cancer? (Yes)	91.51	1.26	7.23	94.30	0.88	4.82
What is the lowest SPF number you should wear? (30 SPF)	51.62	42.63	5.76	51.32	42.98	5.70
What time of day are the sun's rays most dangerous? (10AM-4PM)	75.35	20.50	4.14	73.25	23.25	3.51

Overall knowledge scores were calculated by adding up the number of correct responses to the seven knowledge-based questions for each respondent, with a maximum score of 7 possible. At pre-survey, the overall average score for parents was 5.51 and the median score was 6.0. At post-survey, the overall average score for parents was 5.71 with a median of 6.0. T-testing was conducted for the overall population and each gender to determine if there was a statistically significant increase in knowledge scores from pre- to post-survey for each group. Testing showed a 0.20 statistically significant knowledge increase among the overall population (t= -2.16, p= 0.0317), however increases among males and females were not statistically significant. Table 16 provides the breakdown of correct responses by grade and gender at pre- and post- survey. Results show that females had higher knowledge scores than males at both baseline and post-intervention.

Table 16. Knowledge scores for Parent participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=1,481)			Post-Survey (n= 228)		
Knowledge score (maximum of 7)	**Overall (%)**	**Male (%)**	**Female (%)**	**Overall (%)**	**Male (%)**	**Female (%)**
0	0.85	1.45	0.57	0.44	0	0.5348
1	1.70	2.31	1.51	1.75	4.878	1.0695
2	2.84	6.94	1.51	1.75	0	2.139
3	4.19	5.78	3.68	8.33	4.878	9.0909
4	8.37	11.27	7.36	23.68	34.1463	21.3904
5	20.58	23.41	19.72	36.40	29.2683	37.9679
6	35.49	30.06	37.36	27.63	26.8293	27.8075
7	25.98	18.79	28.30	0.44	0	0.5348
Mean Score	5.51	5.08	5.66	5.71	5.13	5.67
Median Score	6.00	5.00	6.00	6.00	5.00	6.00

Attitude

Parent participants were asked three questions about sun-safety attitude. The first asked how important protecting themselves from the sun is, with results displayed in Figure 11. Responses were very positive, with only 10.1% of responses at pre-survey and 2.19% of responses at post-survey saying it was only kind of important or not important at all. Due to the small sample size at post-survey, further statistical analysis by race and gender was not able to be performed.

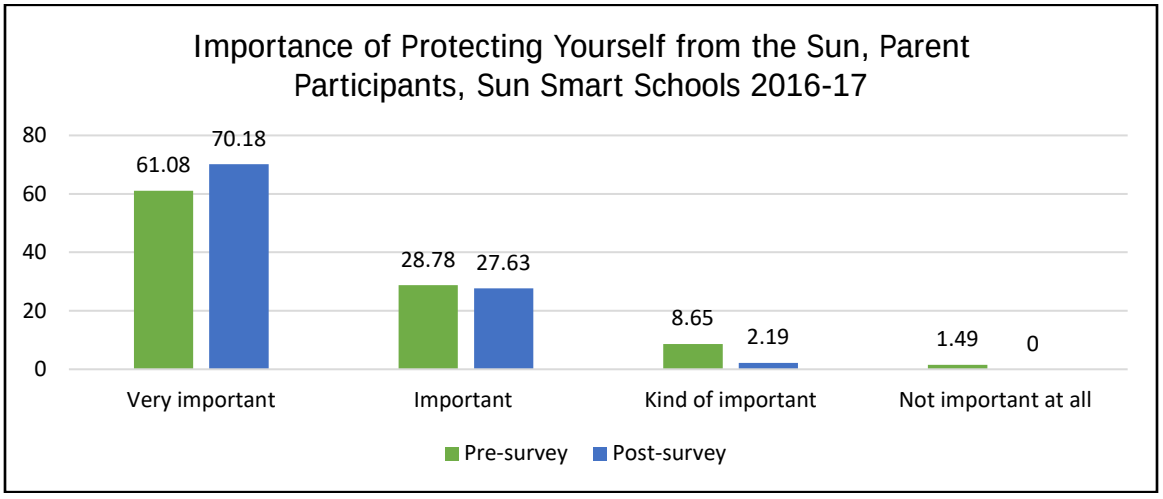

Figure 11

Parent participants were asked if they think they and their friends look better with a tan. There was an 8% increase from pre- to post-survey in the percentage of respondents who answered “yes”, to 45% of participants. Full results are displayed in Figure 12. Logistic regression analyses were performed at pre-survey only, as the sample size was too small in the post-survey to accurately calculate statistics. Results from the adjusted regression analysis showed both race and gender to be statistically

significant indicators of tanning attitude (data not shown). Results suggest women had a 23% reduced odds of thinking they look better with a tan when compared with men (95% CI (0.60, 0.98), p= 0.0352). Additionally, Whites and Native Americans had statistically significant increased odds of thinking they look better with a tan, at 3.41 (95% CI (1.28, 9.12)) and 3.54 (95% CI (1.02, 12.34)), respectively.

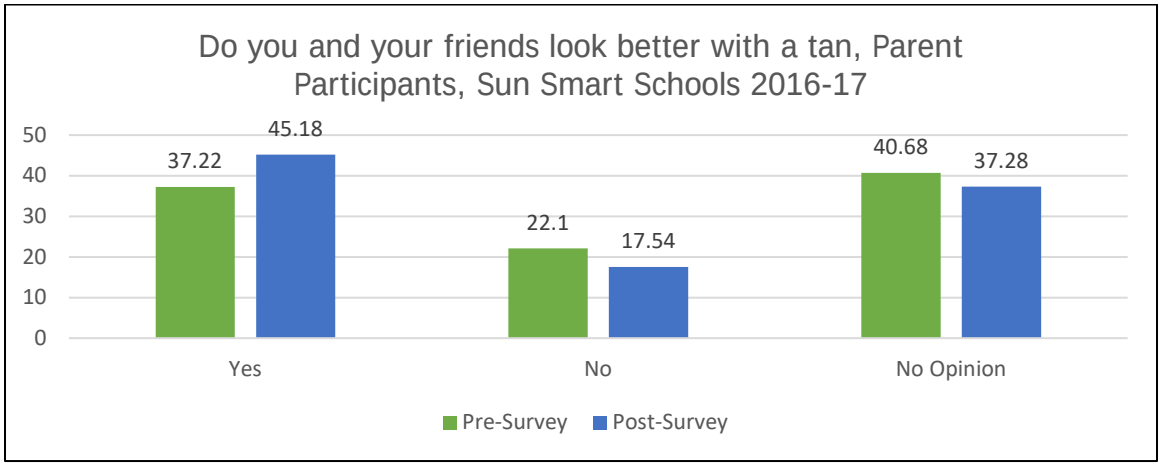

Figure 12

Figures 13-14 display the parent attitudes about the importance of avoiding tanning beds, stratified by gender. The majority of parents felt this was very important at both time points. Females placed a slightly higher importance on avoiding tanning beds when compared to men, with only about 8.5% of respondents saying it was kind of important or not at all important in both pre- and post- surveys. Male responses showed 19.3% of responses at pre-survey as kind of important or not at all important, and this was reduced to 4.9% at post-survey.

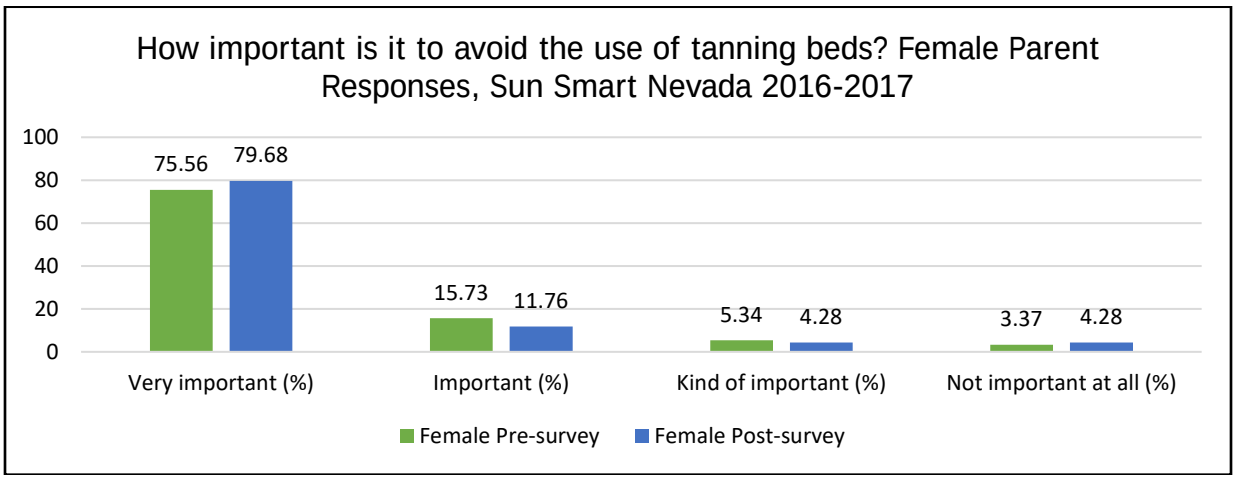

Figure 13

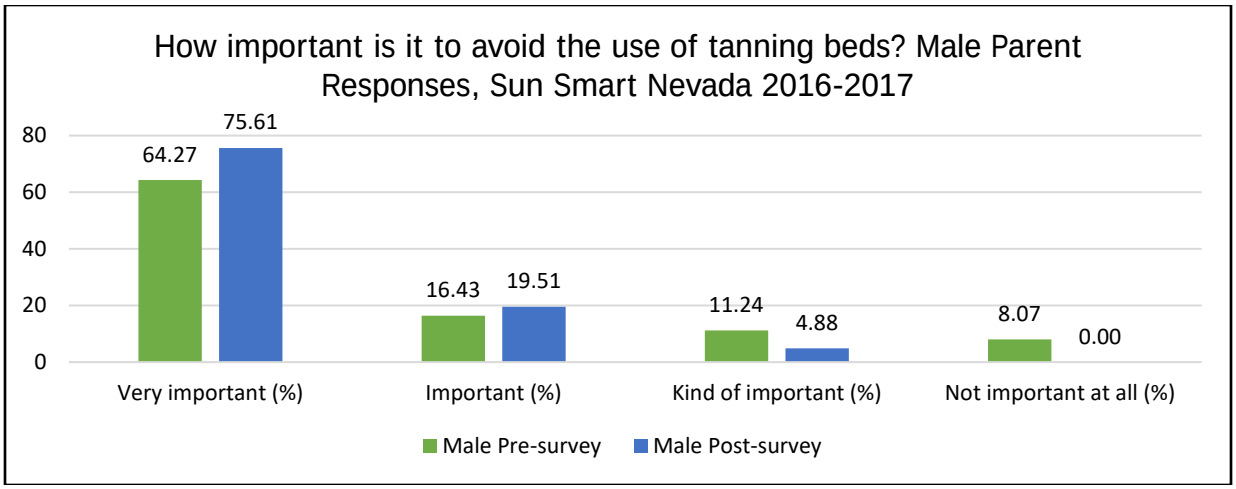

Figure 14

Behavior

Overall, parents expressed positive sun safety behaviors. When asked how often they apply sunscreen when going outside for more than an hour, the majority responded at both pre- and post- survey that they wear it most of the time (58% and 68%, respectively) or sometimes (31% and 25% respectively). At both pre- and post-survey, females reported higher rates than males of wearing sunscreen (results not shown). Figure 15 displays complete results.

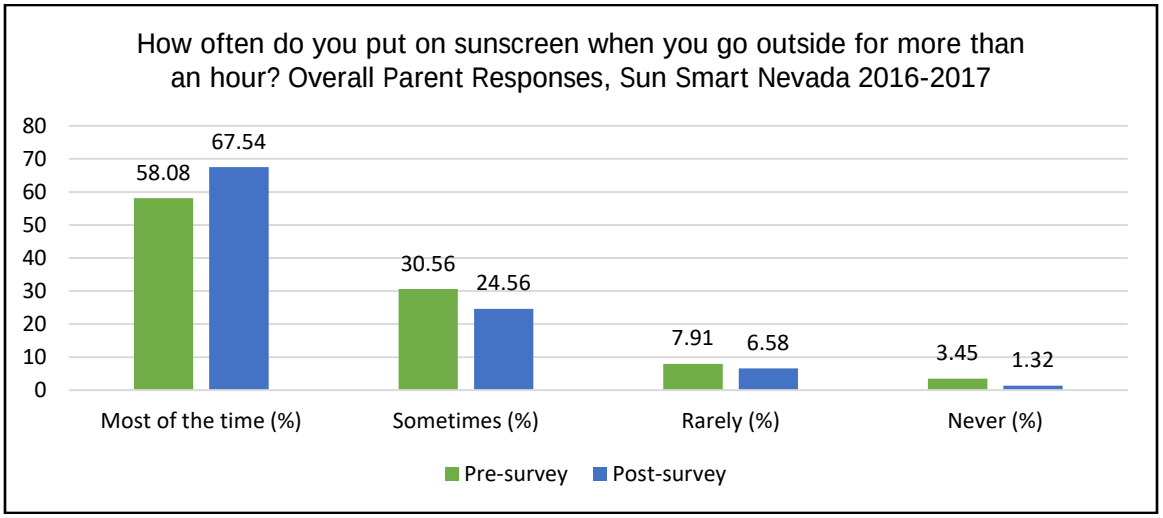

Figure 15

Tanning attitudes showed that women had statistically significant reduced odds of reporting they looked better with a tan and women placed more importance on avoiding tanning beds than men, so tanning bed use has been stratified by gender with results shown in Figures 16-17. Despite these attitudes, there is little difference seen between genders in tanning bed use, and females actually reported slightly higher percentages of tanning bed use in the last five years when compared with men.

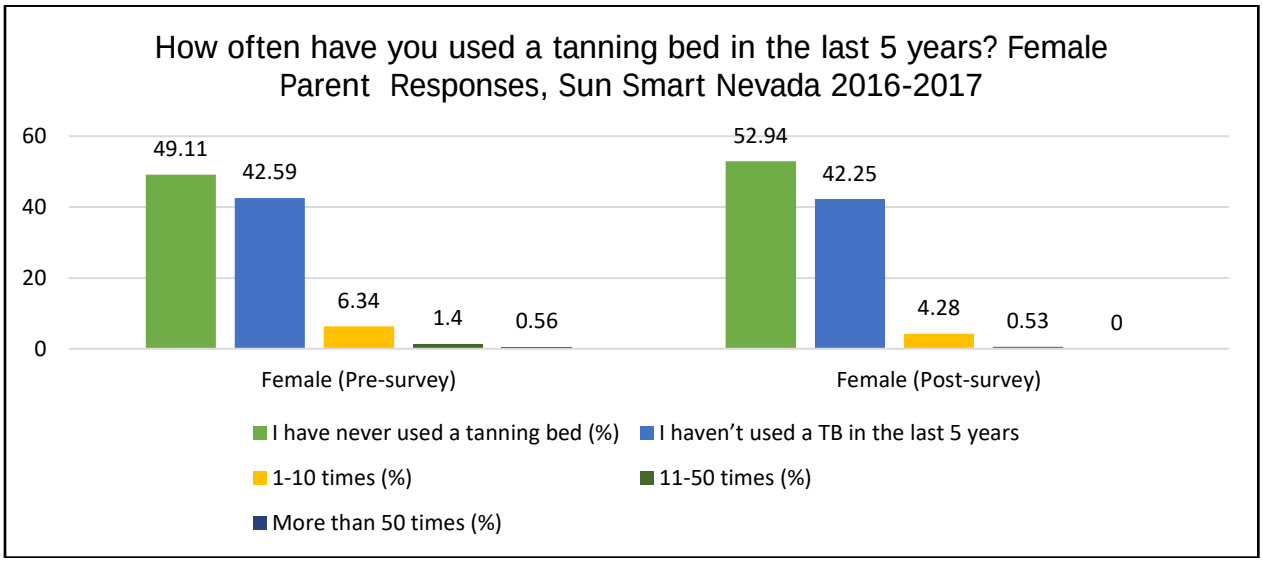

Figure 16

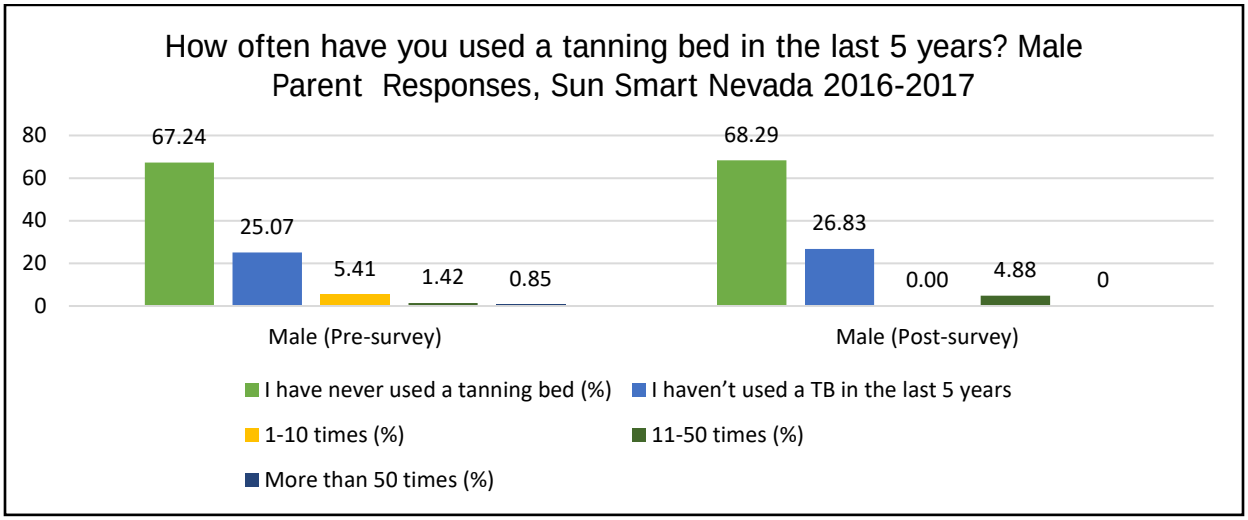

Figure 17

Parents were also asked if their child had ever used a tanning bed. Of those who responded at pre-survey, 99.44% reported their child had never used a tanning bed, however 7 parents noted their child had used one (0.49% of the population). At post-survey, only 1 parent of the 228 respondents said their child had used a tanning bed.

Table 17 shows the sun protection behaviors of the parent respondents. The most commonly used protections were sunscreen and sunglasses. The most common reasons for not protecting themselves were the inconvenience of putting on sunscreen and just not thinking about protecting themselves.

Table 17. Sun protection behaviors of Parent participants of the Sun Smart Schools program 2016-2017

Use of sun protective behaviors			Reasons for not using sun protective behaviors		
	Pre survey (%)	Post survey (%)		Pre survey (%)	Post survey (%)
Wear a hat	64.62	71.49	It is inconvenient to put on sunscreen	17.15	20.61
Wear sunglasses	80.96	87.28	Don't like how I look in hats or long-sleeve shirts when it's hot	4.12	7.02
Wear a long sleeve shirt	19.18	21.05	Hard to find shade	13.17	15.35
Seek shade	48.82	59.65	Just don't think about it	21.34	21.05
Wear sunscreen	81.03	87.28			

Lastly, parents were asked if they model sun-safe behavior to their child. At pre-survey, 90.8% of parents felt they did model sun-safe behavior to their child, and only 9.2% reported not modeling sun-safe behavior. At post-survey, this increased to 94.04% of parents who modeled sun-safe behavior and 5.96% who did not.

Parents were provided the opportunity to comment on their sun protection behaviors. A theme analysis of the comments showed the most common reason parents did not protect themselves was due to forgetting to apply sunscreen or being caught unprepared without it (117/227 comments, 51.5%). A subset of these parents specifically noted focusing on protecting their children and forgetting about themselves.

"I forget after getting all of the kids sunscreened." *Female Parent, pre-survey*

"Didn't know we'd be out for so long, or forget the sunscreen." *Female Parent, pre-survey*

A second theme among parent respondents surrounded the inconvenience of using sun protection, including the expense of sunscreen, dislike of sunscreen, or the discomfort in wearing long sleeve shirts in the summer. A total of 35 respondents discussed these issues, for 15% of overall comments.

"I don't like wearing long sleeve shirts or hats. It's NOT about how I look. It's a comfort thing." *Female Parent, pre-survey*

"Sunscreen can get expensive for a large family" *Male Parent, post-survey*

Lastly, parents noted several reasons for avoiding sunscreen altogether, discussed in about 25% of the comments. Fourteen parents spoke about the importance of getting Vitamin D and avoiding sunscreen for this reason. Eleven parents

noted allergic responses to using sunscreen and 11 parents had general concerns about the chemicals in sunscreen. Ten parents felt they did not need to use sunscreen due to their naturally darker skin tone serving as a protection for them, and 10 parents spoke about wanting to get a tan and thus not wanting to apply sunscreen.

"I have dark skin and dark skinned people need more sun because studies show that dark skinned people lack vitamin D in their system. For this reason, Sun exposure for our family is good." *Female parent, pre-survey*

"When we wear long, hot clothes and sunscreen, we increase our risk of vitamin D deficiency and Americans need more Vitamin D in their bodies." *Female parent, pre-survey*

"I don't want the chemicals of sunscreen baking into my skin." *Female parent, post-survey*

"Sun screen is the leading cause of skin cancer not the sun!" *Male Parent, pre-survey*

Educator & Administrator Participants

Demographics

A total of 199 educators and administrative staff took the pre-survey and 110 took the post-survey. As high school students from Douglas High School were provided with the incorrect link to the educator post-survey, it was not possible to distinguish high school students from educators in the survey data. Therefore, all educator responses from Douglas County were excluded from the analysis.

Most respondents were teachers, were female, and identified as White. Responses were collected from representatives at 19 of the participating schools in the Sun Smart schools program. Full demographic information is provided in Table 18.

Chi-square testing was done to determine how similar pre- and post- survey populations were. Results showed populations did not differ significantly by gender ($p=0.6007$). As only one educator identified as Native American at pre-survey and none did at post-survey, this participant was excluded from chi-square testing for race as the statistic cannot be calculated with a value of 0. Results from the modified racial population gave a p-value of 0.2942, suggesting the pre- and post- survey populations were relatively similar in terms of racial demographics.

Table 18. Characteristics of Educator respondents to the 2016-2017 Sun Smart Schools Pre- and Post-Intervention surveys

	Pre-survey (n= 199)		Post-survey (n= 110)	
Characteristic	n	%	n	%
Role				
Teacher	181	91.41	104	94.55
Administrator	17	8.59	6	5.45
Gender				
Male	35	17.59	22	20.0
Female	164	82.41	88	80.0
Race				
White	178	89.45	93	84.55
Black	0	0	0	0
Hispanic/Latino	9	4.52	8	7.27
Native American	1	0.50	0	0
Asian	3	1.51	5	4.55
Other	8	4.02	4	3.64
School				
Aspire Academy High	--	--	1	0.91
CC Meneley Elementary	1	0.5	4	3.64
Carson Valley Middle	12	6.03	--	--
Douglas High	39	19.6	--	--
Gardnerville Elementary	1	0.5	16	14.55
Hugh Gallagher Elementary	1	0.5	3	2.73
Jacks Valley Elementary	16	8.04	1	0.91
Lenz Elementary	1	0.5	--	--
N/A	1	0.5	4	3.64
Pau-Wa-Lu Middle	30	15.08	23	20.91
Pine Middle	21	10.55	9	8.18
Pinion Hills Elementary	--	--	1	0.91
Rogers Elementary	20	10.05	24	21.82
Scarselli Elementary	18	9.05	1	0.91
South Reno UMC Preschool	2	1.01	--	--
St. Viator Catholic	15	7.54	4	3.64
Virginia City Middle	6	3.02	12	10.91
Whittell High	3	1.51	2	1.82
Zephyr Cove Elementary	12	6.03	5	4.55

Knowledge

Educators were asked seven knowledge based questions about sun safety. Results are displayed in Table 19 for each question. The questions with the least amount of correct responses asked if a base tan is protective against sun damage (73.9% answered correctly) and what is the lowest recommended SPF (55.3%

answered correctly). For all questions except the recommended SPF question, the percentage of correct responses decreased from pre- to post-survey.

Table 19. Responses to knowledge questions and changes for Educator participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=199)			Post-survey (n= 110)		
Question (correct response)	**Correct (%)**	**Incorrect (%)**	**Don't know (%)**	**Correct (%)**	**Incorrect (%)**	**Don't know (%)**
Can spending a lot of time in the sun in childhood lead to skin cancer when you're older? (Yes)	96.98	0	3.02	95.45	1.82	2.73
Does a base tan help protect your skin from sun damage (No)	73.87	8.04	18.09	69.09	3.64	27.27
Can you get a sunburn on a cloudy day? (Yes)	97.99	1.01	1.01	94.55	3.64	1.82
Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin? (Yes)	97.99	0.50	1.51	97.27	0	2.73
Do you think sun exposure or tanning in a tanning bed can cause skin cancer? (Yes)	98.99	0	1.01	93.64	0	6.36
What is the lowest SPF number you should wear? (30 SPF)	55.28	39.70	5.03	57.27	33.64	9.09
What time of day are the sun's rays most dangerous? (10AM-4PM)	87.44	10.56	2.01	77.27	20.0	2.73

Overall knowledge scores were calculated by adding up the number of correct responses to the seven knowledge-based questions for each respondent, with a maximum score of 7 possible. At pre-survey, the overall average score for educators was 6.09 and the median score was 6.0. At post-survey, the overall average score for educators decreased to 5.85 with a median of 6.0. Testing showed changes in means of overall knowledge scores were not statistically significant, showing an overall decrease of 0.24 points from pre-to post-survey (p=0.0638). Men and women both showed non-statistically significant decreases in knowledge scores. Table 20 provides the breakdown of correct responses by grade and gender at pre- and post- survey. Results show that females had higher knowledge scores than males at both baseline and post-intervention.

Table 20. Knowledge scores for Educator participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=199)			Post-Survey (n= 110)		
Knowledge score (maximum of 7)	**Overall (%)**	**Male (%)**	**Female (%)**	**Overall (%)**	**Male (%)**	**Female (%)**
0	0	0	0	0.91	4.55	0
1	0	0	0	0.91	4.55	0
2	0.50	2.86	0	0.91	4.55	0
3	0.50	2.86	0	0.91	0.00	1.14
4	3.02	8.57	1.83	4.55	4.55	4.55
5	17.09	25.71	15.24	17.27	18.18	17.05
6	43.72	40.00	44.51	47.27	45.45	47.73

Table 20. Knowledge scores for Educator participants of the 2016-2017 Sun Smart Schools program

	Pre-Survey (n=199)			Post-Survey (n= 110)		
Knowledge score (maximum of 7)	**Overall (%)**	**Male (%)**	**Female (%)**	**Overall (%)**	**Male (%)**	**Female (%)**
7	35.18	20.00	38.41	27.27	18.18	29.55
Mean Score	6.09	5.57	6.20	5.85	5.22	6.00
Median Score	6.00	6.00	6.00	6.00	6.00	6.00

Attitude

Educators were asked how important protecting themselves from the sun is, and while the majority felt it was very important or important, results at post-survey showed an increase in the percentage of participants who felt it was only kind of important or not important at all. Figure 18 shows results for this question.

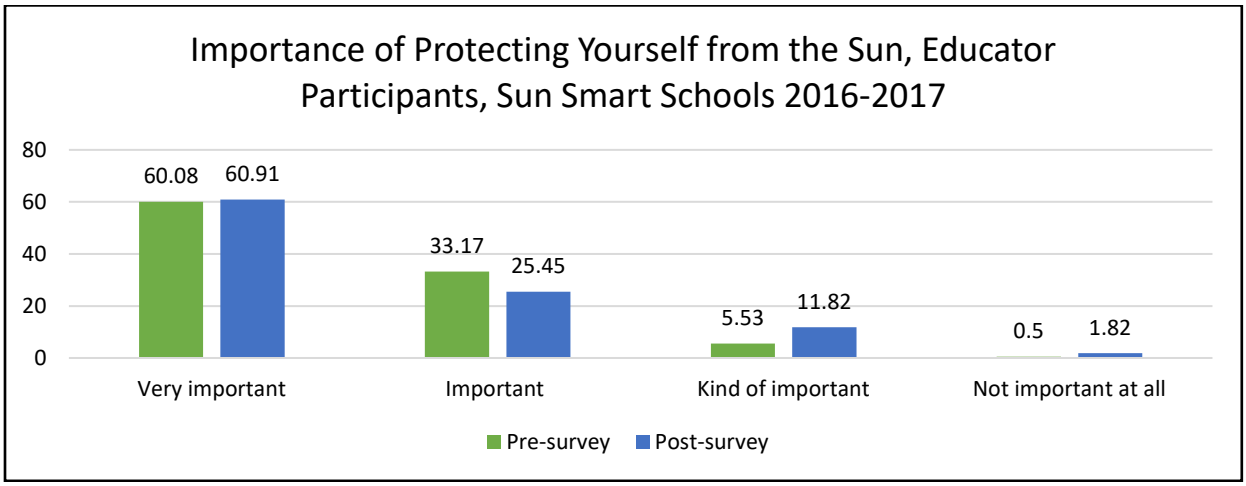

Figure 18

Logistic regression analyses were conducted on this question at both pre- and post- survey to determine the odds of reporting it is very important or important based on different demographics (results not shown). The only demographic variable of significance was gender at post-survey, which showed female educators had 4.67 times the odds of reporting it is important to protect themselves from the sun when compared with males, and not adjusted for other demographic variables. However, at pre-survey, this variable was not significant and showed a much lower odds ratio, likely due to differing populations of survey respondents.

Educators were also asked about tanning attitudes. The majority of participants at pre- and post- surveys felt they did look better with a tan, with the overall percentage increasing slightly from 55.8% at pre-survey to 60% at post-survey, as shown in Figure 19.

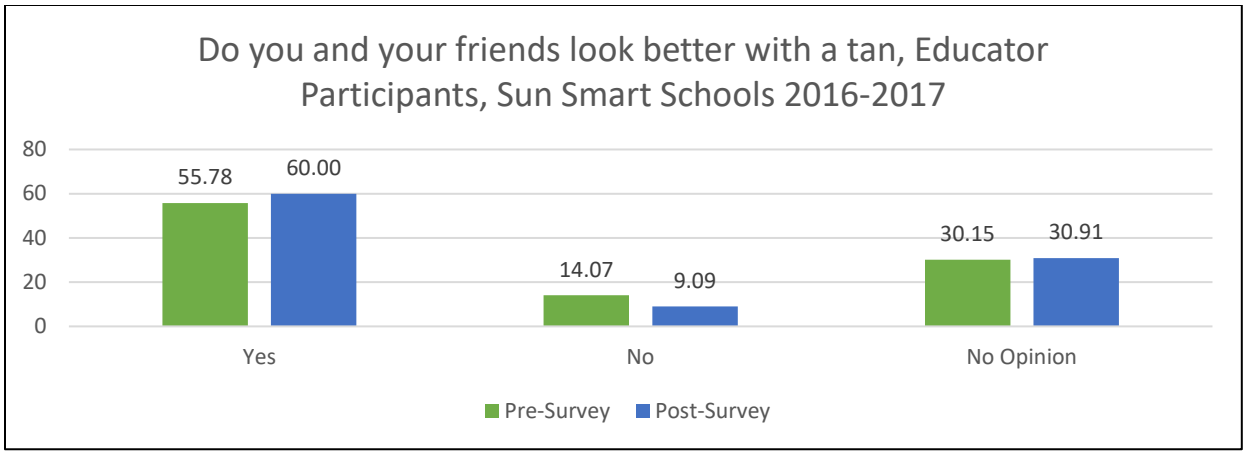

Figure 19

At post-survey no men said they did not look better with a tan, with over 86% of male participants saying they did look better with a tan. Figure 20 stratifies results by gender at pre- and post- survey, showing little difference at pre-survey but significant difference at post-survey for genders, again likely due to differing survey populations.

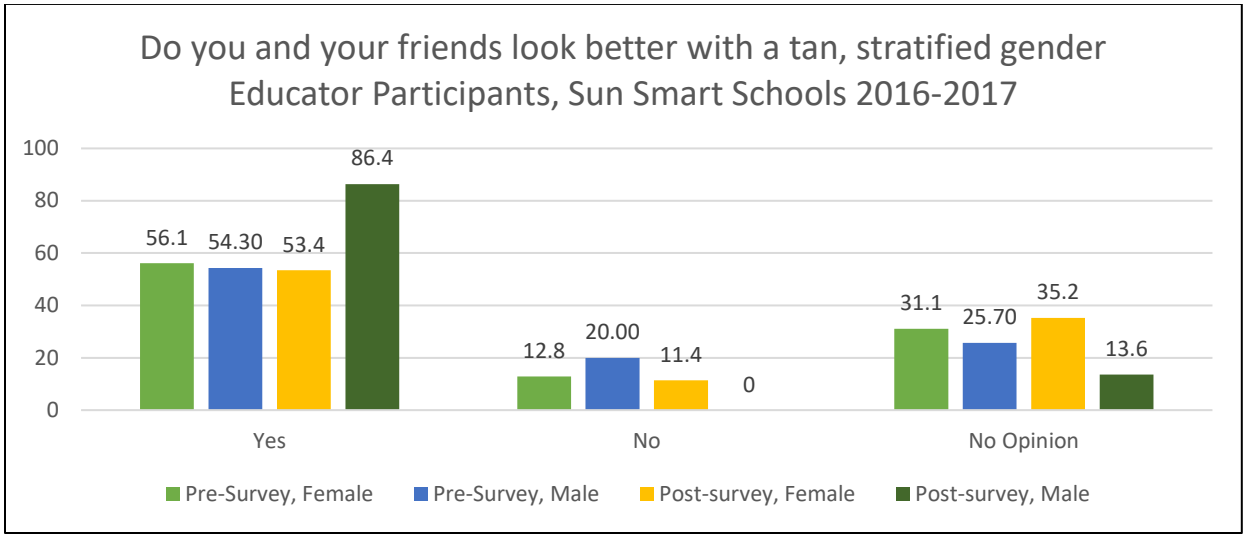

Figure 20

Despite a tendency toward thinking they look better with a tan, when asked how important it is to avoid using tanning beds, educators responded very positively, with 84.4% and 76.4% at pre- and post- survey, respectively, saying it is very important. Results are displayed in Figure 21 below.

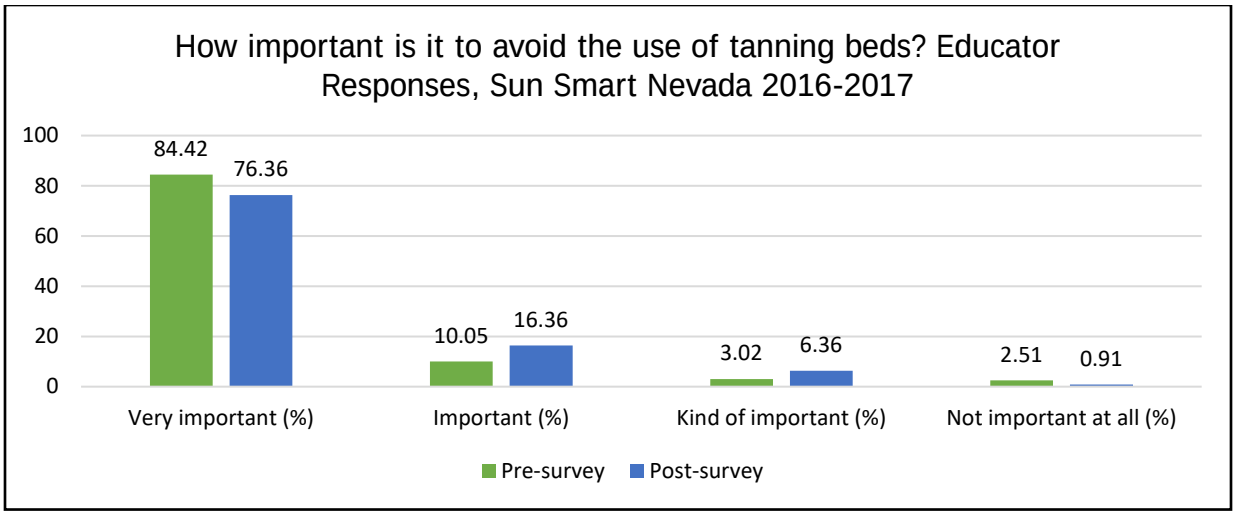

Figure 21

Educators were asked about the existing school policies that make their campus sun-safe. Most participant agreed that the policies in place make it easy to be sun safe while at work, however, about a quarter of respondents disagreed with this statement. Results are displayed in Figure 22.

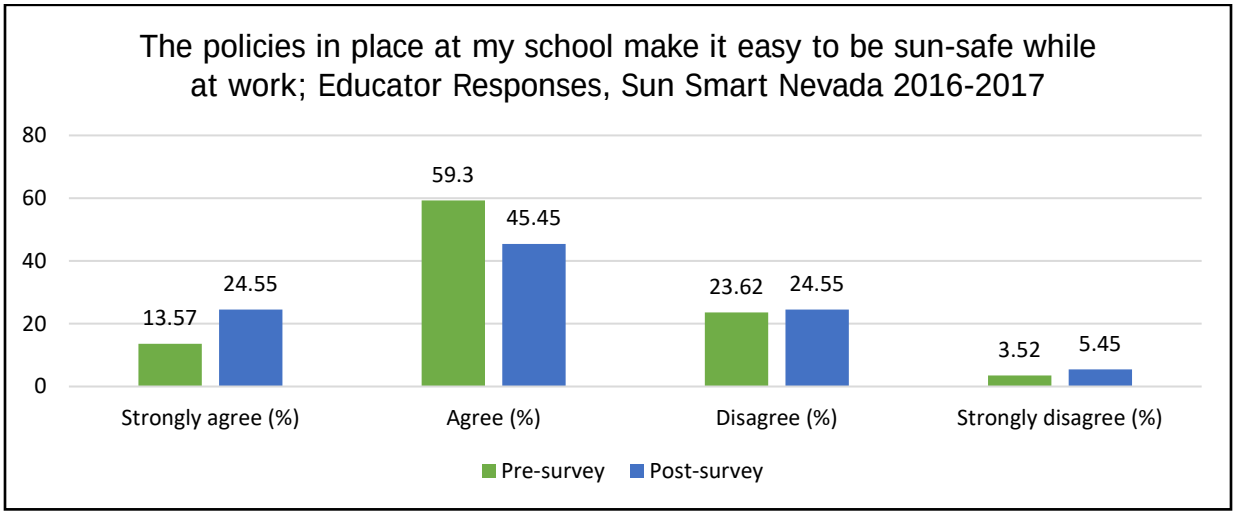

Figure 22

Behavior

Educators were given several questions about their sun-safe behaviors. Figure 23 below shows sunscreen use behaviors stratified by gender. Females showed similar rates of sunscreen use at pre- and post-surveys, with close to 90% of females regularly wearing sunscreen when they go outside for more than an hour. However, males showed lower rates of always or sometimes wearing sunscreen, and rates of rarely or never wearing sunscreen were over 30% at post-survey.

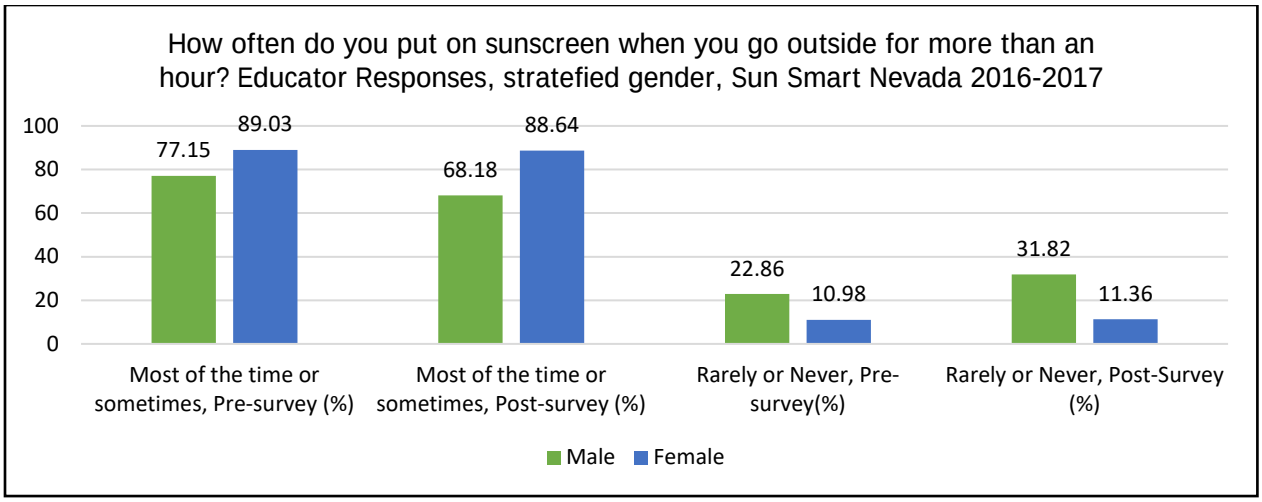

Figure 23

Figures 24-25 show tanning bed use for educator participants. At both pre- and post- surveys, the majority of male educators had never used a tanning bed, whereas only about 50% of female participants had never used a tanning bed. Very few participants from either gender reported regularly using tanning beds.

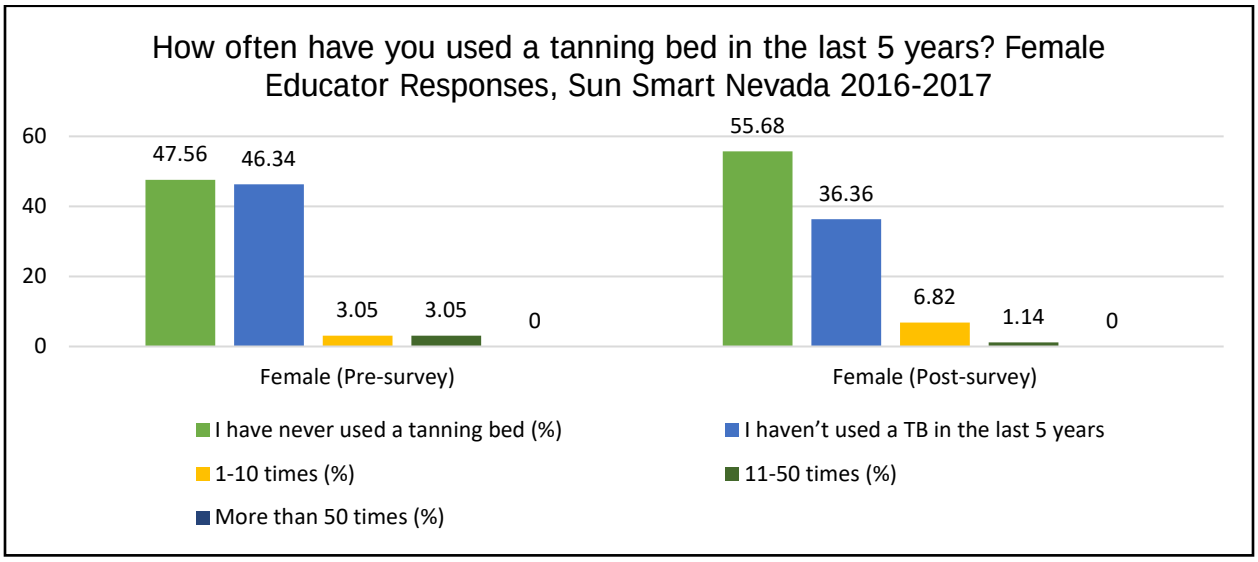

Figure 24

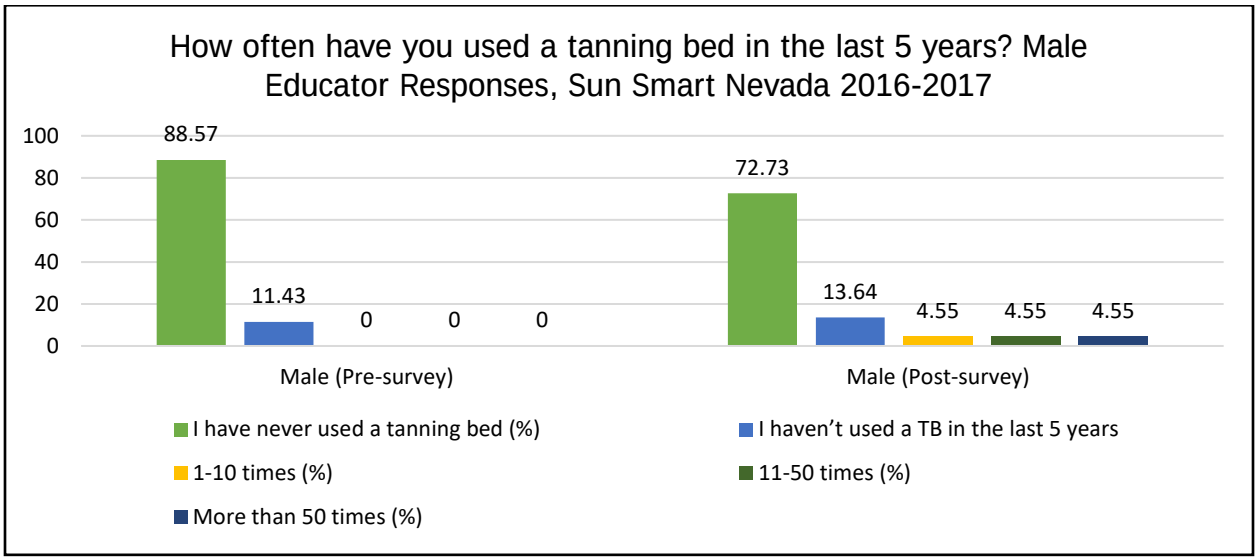

Figure 25

Table 21 displays the sun-protection behaviors reported by educator participants. The most commonly reported behaviors were sunglasses use and sunscreen use. The most common reasons for not protecting themselves from the sun included just not thinking about sun protection and the inconvenience of applying sunscreen.

Table 21. Sun protection behaviors of Educator participants of the Sun Smart Schools program 2016-2017

Use of sun protective behaviors			Reasons for not using sun protective behaviors		
	Pre survey (%)	**Post survey (%)**		**Pre survey (%)**	**Post survey (%)**
Wear a hat	67.34	59.09	It is inconvenient to put on sunscreen	29.15	20.0
Wear sunglasses	89.95	88.18	Don't like how I look in hats or long-sleeve shirts when it's hot	6.03	5.45
Wear a long sleeve shirt	18.59	15.45	Hard to find shade	14.07	22.73
Seek shade	34.67	45.45	Just don't think about it	25.63	30.00
Wear sunscreen	81.41	75.45			

Among educators and staff who provided additional comments about their sun safety behaviors, the most common reason for not protecting themselves from the sun was simply forgetting to practice sun-safe behavior and/or forgetting sunscreen when going out. Of the 70 comments relevant to this topic, 24 (34%) discussed this as the

main reason. Secondly, 13 educators (19% of comments) did not protect themselves when they found themselves on unplanned outings or are outside longer than anticipated. Another theme surrounded issues with using sunscreen. Six commenters mentioned being allergic or sensitive to the chemicals in sunscreen, four noted sunscreen irritates their eyes, and three noted disliking the feel or smell of sunscreen on their skin.

Other interesting themes include the purposeful non-use of protection to tan and enjoy the sun's warmth (6 respondents), and concerns with both blocking Vitamin D uptake and getting cancer from the chemicals present in sunscreen (5 respondents). One participant noted "I have concerns about the chemicals in sunscreen and not getting enough sunshine to produce vitamin D" and another noted "I vacillate uncertainly between the damage from the sun and the damage from slathering chemicals all over my skin!"

Educators and administrators were asked if they model sun-safe behavior to their students and coworkers. At pre-survey, 68.45% of respondents felt they did model sun-safe behavior, and this increased to 72.22% of respondents at post-survey.

In the post-intervention survey, several questions were added to understand use of program materials. Figure 26 below shows the use of the yellow sunscreen dispensers provided by NCC to some of the participating schools. Most participants reported not having a dispenser (30.6%) or never using them if they were available (38.8%).

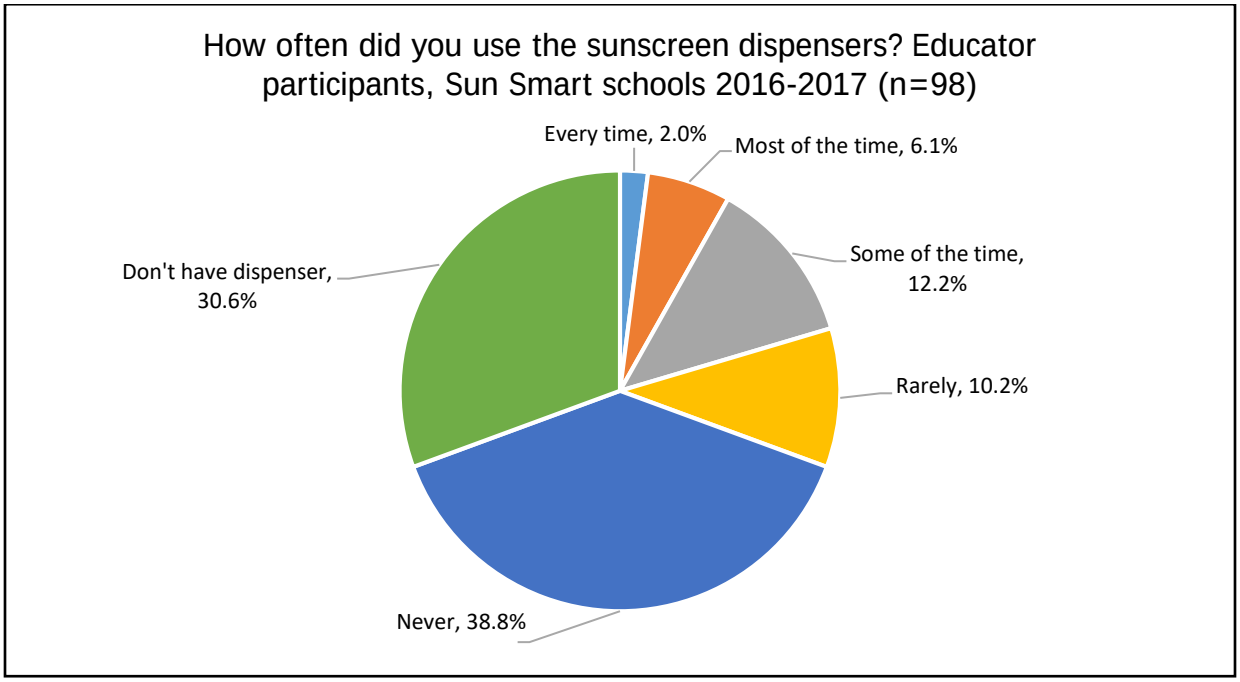

Figure 26

Lastly, educators were asked to provide feedback on the Sun Smart Schools program by detailing which aspects of the program worked for them and providing comments on their experiences. Table 22 displays the materials utilized, showing the sunscreen dispensers to be the most utilized at 40% of respondents, followed by 30% who used Sun Smart posters, and 18% who held assemblies to discuss sun safety. Additionally, the table displays the number of different materials utilized by each respondent, with none being the lowest and 6 being the highest number of materials used. Most educators (43.6%) only used one of the seven options for sun safety improvement, and only 6 of the 110 participants reported using 4 or more of the available materials.

Table 22. Sun Smart program use by school educators and staff, Sun Smart Schools program 2016-2017

Use of Sun Smart Program Materials			Number of materials utilized by each educator		
	n	%		n	%
Curriculum	12	10.91	0	30	27.27
Posters	33	30.0	1	48	43.64
Newsletters	13	11.82	2	19	17.27
Assemblies	20	18.18	3	7	6.36
Guest Speakers	4	3.64	4	5	4.55
Sunscreen	44	40.0	5	0	0
NCC staff	7	6.36	6	1	0.91

Respondents were also provided with the opportunity to give comments about the program. Of the 19 comments, 18 of the responses came from participants that reported using none of the available materials. Eleven respondents commented that they did not use any of the available resources, with most who gave a reason why noting they did not know this was available to them or were not provided with resources. One participant noted the materials being inconvenient to access: “I did not use the resources. They are in the locker rooms and my teaching position does not put me anywhere near the gym area. I also do not go outdoors during the school day.” There were mixed responses with the sunscreen dispensers:

“To be honest, I was not aware of this program. The sunscreen dispensers are not near any of the outside doors I use at school and I think it was empty the one time I went to use it.” *Female teacher*

“The kids use it but it runs out and is not replaced quickly.” *Female teacher*

“I think it is very important to use sunscreen. I like that it is available to the students to use before they go outside.” *Female teacher*

Discussion

This analysis highlighted several strengths of the Sun Smart Schools program and several areas for improvement.

Results of knowledge based questions showed statistically significant increases in knowledge from pre- to post- survey in both the elementary and middle school group and among parents. In all four groups, females had higher overall knowledge scores when compared to males. Additionally, 5th graders, 7th graders, and 8th graders had statistically significant increases in knowledge from pre- to post-survey. Among educators, knowledge scores decreased from pre- to post- intervention, however it was not a statistically significant decrease.

Most participants at all ages understood the connection between UV exposure and skin cancer, wrinkling, and freckling, with the Educator and Parent groups performing the best on these questions. Elementary and middle school students had the lowest overall scores on the knowledge questions but showed the most improvement from pre- to post-intervention. Two questions stood out as being the most difficult to answer at both pre- and post-intervention for all groups. The first asked what the lowest recommended SPF sunscreen is, with the correct answer being 30 SPF. Many who got this question wrong had over-estimated the lowest SPF. The second difficult question asked if a base tan is protective against sun damage, which it is not. Among those who did not answer correctly, most answered that they did not know.

Race and gender appeared to influence sun-safety attitudes among all groups. Those who identified as White expressed more importance in protecting themselves when compared with other races in the elementary and middle school group and high school group. Females also expressed more importance in protecting themselves than males in the elementary and middle school group and educator group.

As age increased across groups, the attitude that having tan skin makes you look better also became more prevalent. Only 20% of elementary and middle school participants thought they looked better with a tan, compared with 44% of high school participants, 45% of parents, and 60% of educators (post-survey responses). Females in high school had a statistically significant 89% increased odds of reporting they look better with a tan when compared with males, while female parents had a statistically significant 23% reduced odds. Among educator respondents, males had higher rates of reporting they look better with a tan.

While attitudes toward wanting a tan trended higher with age, attitudes about using tanning beds trended toward avoidance as age increased. Respondents who said it was very important to avoid tanning beds at pre-survey included 50% of high school students, 64% of parents, and 84% of educators. Female parents had stronger

protective attitudes when compared to male parents, which aligns with their attitudes about not looking better with a tan.

Reported use of wearing sunscreen when going outside for more than an hour increased from pre- to post- intervention among all groups (excluding high school who did not provide post-survey responses). Among all groups at both pre- and post-intervention, females had higher reported rates of wearing sunscreen than males.

Positively, reported tanning bed use among all groups was low. Among high school respondents, males had a higher percentage of use when compared with females, whereas female parents and female educators reported higher use than males. Among female parents, this is surprising as they had much stronger attitudes about avoiding tanning beds and protecting themselves when compared with males.

Sun protective behaviors were different for students and adults. Elementary and middle school students reported using sunscreen and seeking shade most often, and high school students reporting seeking shade or wearing sunglasses. Both parents and educators reported using sunglasses and sunscreen most often. When asked for reasons why they don't protect themselves from the sun, all groups responded that the biggest reason was just not thinking about it. This highlights an opportunity to make sun safety more pervasive across our community and sun protection like sunscreen or shade structures more available.

Several other themes emerged from the analyses of written comments. All groups discussed a feeling of invincibility. Respondents commented that they already had dark skin so they didn't need to protect themselves, and adults noted that they had spent years in the sun with no problems. These concepts highlight an aspect of sun safety that may not be adequately covered in the curriculum or parent newsletters. Responses also highlighted consistency with previous questions that found respondents either forgot to protect themselves or lacked the resources or motivation to do so, and showing the potential impact sunscreen dispensers could have in schools.

Unfortunately, the sunscreen dispensers received negative feedback. Respondents reported that students would throw the sunscreen at each other instead of applying it to themselves, and the machines were often empty or broken.

A small but important subset of respondents expressed serious concern with the chemicals in sunscreen and concern that applying it would make them Vitamin D deficient. These concerns are permeating and likely to span generations, so providing information through Sun Smart Schools about the best sunscreen brands to use to reduce harmful chemical exposure and provide information about Vitamin D synthesis from other sources may help improve sun safety outcomes for these people.

Strengths and Limitations

While this study benefitted from a large sample size and was improved from the original pilot study, there were several limitations to the analysis and study design. First, convenience sampling was used to obtain survey responses. All students, educators, and parents in participating schools were asked to take the surveys, so the people who actually responded may not be representative of the overall population. Additionally, post-intervention surveys were only distributed online, significantly reducing the number of respondents when compared to the pre-survey populations. The post-survey population may be further skewed away from the overall population because of this, as not everyone has access to a computer and without teacher encouragement or time in class to complete the survey, certain subsets of people are unlikely to respond. Moving forward, surveys should be worked into classroom time so a larger, more generalized population provides feedback.

Another limitation was not having a cutoff date for taking the pre-intervention surveys. Because of this, students may have been exposed to sun-safety curriculum before taking the pre-survey, and attitudes may evolve over seasons with weather changes, so students who took the survey in the fall may have different behaviors and attitudes than those who took it in the winter.

Lastly, as individual identifiers were not collected, true pre-post evaluation was not possible. Chi-square testing was done to evaluate whether the pre-survey populations were similar to the post-survey populations in terms of race and gender. For all groups, testing showed that the populations were different, so it is difficult to make definitive conclusions about the results. However, the sample size was large enough that general observations and trends should be reflective of the overall populations.

Despite these issues, the surveys distributed in the 2016-2017 school year asked for demographic indicators, which allowed for analysis to be broken down into subsets. Understanding the differences by gender and race can help inform NCC and educators in how best to teach the material, and what topics need more attention. The surveys were also expanded to ask more questions and gain further insight about areas of improvement and areas of strength.

Conclusion

Overall, results show positive change from pre- to post-intervention. Most groups had improved attitudes, behaviors, and knowledge gains. Analysis was able to distinguish differences in these areas by gender and race, highlighting the need for more targeted approaches in curriculum, newsletters, and assemblies. As respondents aged, concern with tanned appearance increased, adding further encouragement to the

importance of implementing the Sun Smart Schools program early. The results show the need to focus on teachable areas at all ages and reduce the amount of misinformation about sunscreens and the importance of preventive action to help reduce rates of skin cancer.

References

Nevada Cancer Coalition. (2017). Sun Smart Nevada. Retrieved from http://nevadacancercoalition.org/sun-smart-nevada.

Appendix I: Elementary & Middle School Survey Questions
Pre-Survey

1. What school do you go to?
2. What grade are you in? 4, 5, 6, 7, 8
3. Are you: Boy, Girl
4. What is your race? White, Black, Hispanic/Latino, Native American, Asian, Other
5. How important to you is protecting yourself from the sun?
    a. Very important
    b. Important
    c. Kind of important
    d. Not important at all
6. How often do you put on sunscreen when you go outside for more than one hour?
    a. Most of the time
    b. Sometimes
    c. Rarely
    d. Never
7. Do you think spending a lot of time in the sun as a child can cause wrinkled or freckled skin when you grow up?
    a. Yes
    b. No
    c. I don't know
8. Can spending a lot of time in the sun cause skin cancer when you grow up?
    a. Yes
    b. No
    c. I don't know
9. When you are outside in the middle of the day, which of the following do you do to protect yourself from the sun: (mark all that apply)
    a. Wear a hat
    b. Wear sunglasses
    c. Wear a long sleeve shirt
    d. Stay in the shade most of the time
    e. Wear sunscreen
    f. None of the above
10. Why don't you protect yourself from the sun? (mark all that apply)
    a. Sunscreen is too messy to put on
    b. I don't like wearing hats or long-sleeved shirts when it's hot outside
    c. My friends will think I'm weird if I protect myself from the sun
    d. It's hard to find shade when I'm outside
    e. I just don't think about protecting myself from the sun
    f. Other:
11. Suntan is a browning of the skin that is caused by sun rays, also known as Ultra Violet (UV) rays. Do you think you and your friends look better with a suntan?
    a. Yes
    b. No
    c. No opinion
12. Can you get a sunburn on a cloudy day?
    a. Yes
    b. No
    c. I don't know
13. When you put on sunscreen, the SPF number tells you how much protection it has. What is the lowest SPF number you should wear?
    a. 15
    b. 30
    c. 50

   d. 100
   e. I don't know
   f. I don't use sunscreen
14. What time of day are the sun's rays most dangerous?
   a. 8 AM – 10 AM
   b. 10 AM – 4 PM
   c. 4 PM – 8 PM
   d. All day
   e. I don't know

Post-Survey

1. What school do you go to?
2. What grade are you in? 4, 5, 6, 7, 8
3. Are you: Boy, Girl
4. What is your race? White, Black, Hispanic/Latino, Native American, Asian, Other
5. How important to you is protecting yourself from the sun?
   a. Very important
   b. Important
   c. Kind of important
   d. Not important at all
6. How often do you put on sunscreen when you go outside for more than one hour?
   a. Most of the time
   b. Sometimes
   c. Rarely
   d. Never
7. Do you think spending a lot of time in the sun as a child can cause wrinkled or freckled skin when you grow up?
   a. Yes
   b. No
   c. I don't know
8. Can spending a lot of time in the sun cause skin cancer when you grow up?
   a. Yes
   b. No
   c. I don't know
9. When you are outside in the middle of the day, which of the following do you do to protect yourself from the sun: (mark all that apply)
   a. Wear a hat
   b. Wear sunglasses
   c. Wear a long sleeve shirt
   d. Stay in the shade most of the time
   e. Wear sunscreen
   f. None of the above
10. Why don't you protect yourself from the sun? (mark all that apply)
   a. Sunscreen is too messy to put on
   b. I don't like wearing hats or long-sleeved shirts when it's hot outside
   c. My friends will think I'm weird if I protect myself from the sun
   d. It's hard to find shade when I'm outside
   e. I just don't think about protecting myself from the sun
   f. Other:
11. Suntan is a browning of the skin that is caused by sun rays, also known as Ultra Violet (UV) rays. Do you think you and your friends look better with a suntan?
   a. Yes
   b. No
   c. No opinion

12. Can you get a sunburn on a cloudy day?
    a. Yes
    b. No
    c. I don't know
13. When you put on sunscreen, the SPF number tells you how much protection it has. What is the lowest SPF number you should wear?
    a. 15
    b. 30
    c. 50
    d. 100
    e. I don't know
    f. I don't use sunscreen
14. What time of day are the sun's rays most dangerous?
    a. 8 AM – 10 AM
    b. 10 AM – 4 PM
    c. 4 PM – 8 PM
    d. All day
    e. I don't know
15. How often did you use the yellow sunscreen dispensers at school before going outside for things like gym class, recess, or to play sports?
    a. Every time
    b. Most of the time
    c. Some of the time
    d. Rarely
    e. Never
    f. We do not have yellow sunscreen dispensers at our school
    g. I bring and use my own sunscreen
16. Do you think you will do more to protect yourself from the sun this summer after learning about sun safety during this school year?
    a. Yes
    b. No

Appendix II: High School Survey Questions
Pre-Survey

1. What school do you go to?
2. What grade are you in? 9, 10, 11, 12
3. What class are you in?
    a. Health
    b. Computer Keyboarding
4. Gender: Male, Female
5. What is your race? White, Black, Hispanic/Latino, Native American, Asian, Other
6. Do you participate in school-sponsored extracurricular activities like athletics or band? Yes, No, If yes which?
7. How important to you is protecting yourself from the sun?
    a. Very important
    b. Important
    c. Kind of important
    d. Not important at all
8. Can spending a lot of time in the sun in childhood lead to skin cancer when you're older?
    a. Yes
    b. No
    c. I don't know
9. How often do you put on sunscreen when you go outside for more than one hour?
    a. Most of the time
    b. Sometimes
    c. Rarely
    d. Never
10. When you are outside in the middle of the day, which of the following do you do to protect yourself from the sun: (mark all that apply)
    a. Wear a hat
    b. Wear sunglasses
    c. Wear a long sleeve shirt
    d. Stay in the shade most of the time
    e. Wear sunscreen
    f. None of the above
11. Why don't you protect yourself from the sun? (mark all that apply)
    a. Sunscreen is too messy to put on
    b. I don't like wearing hats or long-sleeved shirts when it's hot outside
    c. My friends will think I'm weird if I protect myself from the sun
    d. It's hard to find shade when I'm outside
    e. I just don't think about protecting myself from the sun
    f. Other:
12. Do you think you and your friends look better with a tan?
    a. Yes
    b. No
    c. No opinion
13. Does a base tan help protect your skin from sun damage?
    a. Yes
    b. No
    c. I don't know
14. Can you get a sunburn on a cloudy day?
    a. Yes
    b. No
    c. I don't know
15. Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin?
    a. Yes

   b. No
   c. I don't know
16. Do you think sun exposure or tanning in a tanning bed can cause skin cancer?
   a. Yes
   b. No
   c. I don't know
17. How often have you used an indoor tanning bed in the last 5 years?
   a. I have never used a tanning bed
   b. I have not used a tanning bed in the last 5 years
   c. 1-10 times
   d. 11-50 times
   e. More than 50 times
18. Is it important to avoid the use of tanning beds?
   a. Yes, very important
   b. Important
   c. Kind of important
   d. No, not important at all
19. When you put on sunscreen, the SPF number tells you how much protection it has. What is the lowest SPF number you should wear?
   a. 15
   b. 30
   c. 50
   d. 100
   e. I don't know
   f. I don't use sunscreen
20. What time of day are the sun's rays most dangerous?
   a. 8 AM – 10 AM
   b. 10 AM – 4 PM
   c. 4 PM – 8 PM
   d. All day
   e. I don't know

Post-Survey

1. What school do you go to?
2. What grade are you in? 9, 10, 11, 12
3. What class are you in?
   a. Health
   b. Computer Keyboarding
4. Gender: Male, Female
5. What is your race? White, Black, Hispanic/Latino, Native American, Asian, Other
6. Do you participate in school-sponsored extracurricular activities like athletics or band? Yes, No, If yes which?
7. How important to you is protecting yourself from the sun?
   a. Very important
   b. Important
   c. Kind of important
   d. Not important at all
8. Can spending a lot of time in the sun in childhood lead to skin cancer when you're older?
   a. Yes
   b. No
   c. I don't know
9. How often do you put on sunscreen when you go outside for more than one hour?
   a. Most of the time
   b. Sometimes

c. Rarely
d. Never

10. When you are outside in the middle of the day, which of the following do you do to protect yourself from the sun: (mark all that apply)
    a. Wear a hat
    b. Wear sunglasses
    c. Wear a long sleeve shirt
    d. Stay in the shade most of the time
    e. Wear sunscreen
    f. None of the above
11. Why don't you protect yourself from the sun? (mark all that apply)
    a. Sunscreen is too messy to put on
    b. I don't like wearing hats or long-sleeved shirts when it's hot outside
    c. My friends will think I'm weird if I protect myself from the sun
    d. It's hard to find shade when I'm outside
    e. I just don't think about protecting myself from the sun
    f. Other:
12. Do you think you and your friends look better with a tan?
    a. Yes
    b. No
    c. No opinion
13. Does a base tan help protect your skin from sun damage?
    a. Yes
    b. No
    c. I don’t know
14. Can you get a sunburn on a cloudy day?
    a. Yes
    b. No
    c. I don’t know
15. Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin?
    a. Yes
    b. No
    c. I don’t know
16. Do you think sun exposure or tanning in a tanning bed can cause skin cancer?
    a. Yes
    b. No
    c. I don’t know
17. How often have you used an indoor tanning bed in the last 5 years?
    a. I have never used a tanning bed
    b. I have not used a tanning bed in the last 5 years
    c. 1-10 times
    d. 11-50 times
    e. More than 50 times
18. Is it important to avoid the use of tanning beds?
    a. Yes, very important
    b. Important
    c. Kind of important
    d. No, not important at all
19. When you put on sunscreen, the SPF number tells you how much protection it has. What is the lowest SPF number you should wear?
    a. 15
    b. 30
    c. 50
    d. 100

e. I don't know
f. I don't use sunscreen

20. What time of day are the sun's rays most dangerous?
    a. 8 AM – 10 AM
    b. 10 AM – 4 PM
    c. 4 PM – 8 PM
    d. All day
    e. I don't know
21. How often did you use the yellow sunscreen dispensers at school before going outside for things like gym class or athletic practice?
    a. Every time
    b. Most of the time
    c. Some of the time
    d. Rarely
    e. Never
    f. We don't have yellow sunscreen dispensers at our school
    g. I bring and use my own sunscreen
22. Do you think you will do more to protect yourself from the sun this summer after learning about sun safety during this school year?
    a. Yes
    b. No

Appendix III: Parent Survey Questions
Pre-Survey

1. What school does your child attend?
2. What grade is your child in? PK/K, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
3. Are you: Male, Female
4. What is your race? White, Black, Hispanic/Latino, Native American, Asian, Other
5. How important to you is protecting yourself from the sun?
    a. Very important
    b. Important
    c. Kind of important
    d. Not important at all
6. Can spending a lot of time in the sun in childhood lead to skin cancer when you're older?
    a. Yes
    b. No
    c. I don't know
7. How often do you put on sunscreen when you go outside for more than one hour?
    a. Most of the time
    b. Sometimes
    c. Rarely
    d. Never
8. When you are outside in the middle of the day, which of the following do you do to protect yourself from the sun: (mark all that apply)
    a. Wear a hat
    b. Wear sunglasses
    c. Wear a long sleeve shirt
    d. Stay in the shade most of the time
    e. Wear sunscreen
    f. None of the above
9. Why don't you protect yourself from the sun? (mark all that apply)
    a. It is inconvenient to put on sunscreen
    b. I don't like how I look in sun-protective clothing like hats or long-sleeve shirts
    c. It's hard to find shade when I'm outside
    d. I just don't think about protecting myself from the sun
    e. Other:
10. Do you think people look better with a tan?
    a. Yes
    b. No
    c. No opinion
11. Does a base tan help protect your skin from sun damage?
    a. Yes
    b. No
    c. I don't know
12. Can you get a sunburn on a cloudy day?
    a. Yes
    b. No
    c. I don't know
13. Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin?
    a. Yes
    b. No
    c. I don't know
14. Do you think sun exposure or tanning in a tanning bed can cause skin cancer?
    a. Yes
    b. No
    c. I don't know

15. How often have you used an indoor tanning bed in the last 5 years?
    a. I have never used a tanning bed
    b. I have not used a tanning bed in the last 5 years
    c. 1-10 times
    d. 11-50 times
    e. More than 50 times
16. Has your child ever used a tanning bed?
    a. Yes
    b. No
    c. I don't know
17. Is it important to avoid the use of tanning beds?
    a. Yes, very important
    b. Important
    c. Kind of important
    d. No, not important at all
18. When you put on sunscreen, the SPF number tells you how much protection it has. What is the lowest SPF number you should wear?
    a. 15
    b. 30
    c. 50
    d. 100
    e. I don't know
    f. I don't use sunscreen
19. What time of day are the sun's rays most dangerous?
    a. 8 AM – 10 AM
    b. 10 AM – 4 PM
    c. 4 PM – 8 PM
    d. All day
    e. I don't know
20. Do you model sun-safe behavior to your child?
    a. Yes
    b. No

Post-Survey

1. What school does your child attend?
2. What grade is your child in? PK/K, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
3. Are you: Male, Female
4. What is your race? White, Black, Hispanic/Latino, Native American, Asian, Other
5. How important to you is protecting yourself from the sun?
    a. Very important
    b. Important
    c. Kind of important
    d. Not important at all
6. Can spending a lot of time in the sun in childhood lead to skin cancer when you're older?
    a. Yes
    b. No
    c. I don't know
7. How often do you put on sunscreen when you go outside for more than one hour?
    a. Most of the time
    b. Sometimes
    c. Rarely
    d. Never
8. When you are outside in the middle of the day, which of the following do you do to protect yourself from the sun: (mark all that apply)

   a. Wear a hat
   b. Wear sunglasses
   c. Wear a long sleeve shirt
   d. Stay in the shade most of the time
   e. Wear sunscreen
   f. None of the above
9. Why don't you protect yourself from the sun? (mark all that apply)
   a. It is inconvenient to put on sunscreen
   b. I don't like how I look in sun-protective clothing like hats or long-sleeve shirts
   c. It's hard to find shade when I'm outside
   d. I just don't think about protecting myself from the sun
   e. Other:
10. Do you think people look better with a tan?
   a. Yes
   b. No
   c. No opinion
11. Does a base tan help protect your skin from sun damage?
   a. Yes
   b. No
   c. I don't know
12. Can you get a sunburn on a cloudy day?
   a. Yes
   b. No
   c. I don't know
13. Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin?
   a. Yes
   b. No
   c. I don't know
14. Do you think sun exposure or tanning in a tanning bed can cause skin cancer?
   a. Yes
   b. No
   c. I don't know
15. How often have you used an indoor tanning bed in the last 5 years?
   a. I have never used a tanning bed
   b. I have not used a tanning bed in the last 5 years
   c. 1-10 times
   d. 11-50 times
   e. More than 50 times
16. Has your child ever used a tanning bed?
   a. Yes
   b. No
   c. I don't know
17. Is it important to avoid the use of tanning beds?
   a. Yes, very important
   b. Important
   c. Kind of important
   d. No, not important at all
18. When you put on sunscreen, the SPF number tells you how much protection it has. What is the lowest SPF number you should wear?
   a. 15
   b. 30
   c. 50
   d. 100
   e. I don't know

f. I don't use sunscreen

19. What time of day are the sun's rays most dangerous?
    a. 8 AM – 10 AM
    b. 10 AM – 4 PM
    c. 4 PM – 8 PM
    d. All day
    e. I don't know
20. Do you model sun-safe behavior to your child?
    a. Yes
    b. No

Appendix IV: Teacher and Staff Survey Questions
Pre-Survey

1. Please select the school at which you work.
2. Please select the grade(s) you teach or work with PK/K, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
3. Gender: Male, Female
4. What is your race? White, Black, Hispanic/Latino, Native American, Asian, Other
5. How important to you is protecting yourself from the sun?
    a. Very important
    b. Important
    c. Kind of important
    d. Not important at all
6. Can spending a lot of time in the sun in childhood lead to skin cancer when you're older?
    a. Yes
    b. No
    c. I don't know
7. How often do you put on sunscreen when you go outside for more than one hour?
    a. Most of the time
    b. Sometimes
    c. Rarely
    d. Never
8. When you are outside in the middle of the day, which of the following do you do to protect yourself from the sun: (mark all that apply)
    a. Wear a hat
    b. Wear sunglasses
    c. Wear a long sleeve shirt
    d. Stay in the shade most of the time
    e. Wear sunscreen
    f. None of the above
9. What is your primary reason for not protecting yourself from the sun?
    a. It is inconvenient to put on sunscreen
    b. I don't like how I look in sun-protective clothing like hats or long-sleeve shirts
    c. It's hard to find shade when I'm outside
    d. I just don't think about protecting myself from the sun
    e. Other:
10. Do you think people look better with a tan?
    a. Yes
    b. No
    c. No opinion
11. Does a base tan help protect your skin from sun damage?
    a. Yes
    b. No
    c. I don't know
12. Can you get a sunburn on a cloudy day?
    a. Yes
    b. No
    c. I don't know
13. Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin?
    a. Yes
    b. No
    c. I don't know
14. Do you think sun exposure or tanning in a tanning bed can cause skin cancer?

   a. Yes
   b. No
   c. I don't know
15. How often have you used an indoor tanning bed in the last 5 years?
   a. I have never used a tanning bed
   b. I have not used a tanning bed in the last 5 years
   c. 1-10 times
   d. 11-50 times
   e. More than 50 times
16. Is it important to avoid the use of tanning beds?
   a. Yes, very important
   b. Important
   c. Kind of important
   d. No, not important at all
17. When you put on sunscreen, the SPF number tells you how much protection it has. What is the lowest SPF number you should wear?
   a. 15
   b. 30
   c. 50
   d. 100
   e. I don't know
   f. I don't use sunscreen
18. What time of day are the sun's rays most dangerous?
   a. 8 AM – 10 AM
   b. 10 AM – 4 PM
   c. 4 PM – 8 PM
   d. All day
   e. I don't know
19. Do you model sun-safe behavior to your students and coworkers?
   a. Yes
   b. No
   c. I don't know
20. The policies in place at my school make it easy to be sun-safe while at work.
   a. Strongly agree
   b. Agree
   c. Disagree
   d. Strongly disagree

Post-Survey

1. Please select the school at which you work.
2. Please select the grade(s) you teach or work with PK/K, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
3. Gender: Male, Female
4. What is your race? White, Black, Hispanic/Latino, Native American, Asian, Other
5. How important to you is protecting yourself from the sun?
   a. Very important
   b. Important
   c. Kind of important
   d. Not important at all
6. Can spending a lot of time in the sun in childhood lead to skin cancer when you're older?
   a. Yes
   b. No
   c. I don't know
7. How often do you put on sunscreen when you go outside for more than one hour?
   a. Most of the time

   b. Sometimes
   c. Rarely
   d. Never
8. When you are outside in the middle of the day, which of the following do you do to protect yourself from the sun: (mark all that apply)
   a. Wear a hat
   b. Wear sunglasses
   c. Wear a long sleeve shirt
   d. Stay in the shade most of the time
   e. Wear sunscreen
   f. None of the above
9. What is your primary reason for not protecting yourself from the sun?
   a. It is inconvenient to put on sunscreen
   b. I don't like how I look in sun-protective clothing like hats or long-sleeve shirts
   c. It's hard to find shade when I'm outside
   d. I just don't think about protecting myself from the sun
   e. Other:
10. Do you think people look better with a tan?
   a. Yes
   b. No
   c. No opinion
11. Does a base tan help protect your skin from sun damage?
   a. Yes
   b. No
   c. I don't know
12. Can you get a sunburn on a cloudy day?
   a. Yes
   b. No
   c. I don't know
13. Do you think sun exposure or using tanning beds can cause wrinkled or freckled skin?
   a. Yes
   b. No
   c. I don't know
14. Do you think sun exposure or tanning in a tanning bed can cause skin cancer?
   a. Yes
   b. No
   c. I don't know
15. How often have you used an indoor tanning bed in the last 5 years?
   a. I have never used a tanning bed
   b. I have not used a tanning bed in the last 5 years
   c. 1-10 times
   d. 11-50 times
   e. More than 50 times
16. Is it important to avoid the use of tanning beds?
   a. Yes, very important
   b. Important
   c. Kind of important
   d. No, not important at all
17. When you put on sunscreen, the SPF number tells you how much protection it has. What is the lowest SPF number you should wear?
   a. 15
   b. 30
   c. 50
   d. 100

e. I don't know
f. I don't use sunscreen

18. What time of day are the sun's rays most dangerous?
    a. 8 AM – 10 AM
    b. 10 AM – 4 PM
    c. 4 PM – 8 PM
    d. All day
    e. I don't know
19. Do you model sun-safe behavior to your students and coworkers?
    a. Yes
    b. No
    c. I don't know
20. How often did you use the yellow sunscreen dispensers at your school before going outside for things like recess, a PE class or a sports practice?
    a. Every time
    b. Most of the time
    c. Some of the time
    d. Rarely
    e. Never
    f. We do not have yellow sunscreen dispensers at our school
    g. I bring and use my own sunscreen
21. Did you use any of the Sun Smart Schools resources provided to your school? (select all that apply)
    a. Curriculum
    b. Posters
    c. Newsletters
    d. Assemblies
    e. Guest speakers
    f. Sunscreen
    g. Phone or in-person contact with Nevada Cancer Coalition staff
    h. Other
22. The policies in place at my school make it easy to be sun-safe while at work.
    a. Strongly agree
    b. Agree
    c. Disagree
    d. Strongly disagree